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Abstract

Abstract 97

EARLY OCULAR PHENOTYPE AND PROGRESSION OF COBALAMIN C DEFICIENCY: EXPERIENCE OF AN ITALIAN CENTRE.

Oral

Nassisi M.*[1], Osnaghi S.[2], Furlan F.[2], Menni F.[2], Minorini V.[2], Dolci M.P.[1], Viola F.[1]

[1]Department of Clinical Sciences and Community Health, University of Milan, Milan, Italy. ~ Milan ~ Italy, [2]Fondazione IRCCS Ca' Granda Ospedale Maggiore Policlinico, Milan, Italy ~ Milan ~ Italy

Purpose:

to report the ocular manifestations of cobalamin C (Cbl-C) deficiency, a rare autosomal recessive disease caused by mutations on the MMACHC gene.

Methods:

Clinical data from 8 children (4 females; median age at last available visit: 7,61 years; range: 1-11,32 years) with molecular diagnosis of Cbl-C deficit were retrospectively reviewed. Three of them were diagnosed at birth thanks to the extensive neonatal screening program, which became routinely performed since 2016. The others were diagnosed after the occurrence of hemolytic uremic syndrome. Color fundus photographs (CFP) and optical coherence tomography (OCT) images were collected and analyzed.

Results:

Nystagmus was present in 7 patients and 2 of them had high myopia (>6D). Visual acuity (available for 6 patients) was always ≤ 20/200 Snellen in the best eye. When available, CFP within the first month of age showed an altered foveal reflex, while a thinning of the outer retinal layers involving the fovea was already evident on OCT. At last visit (median follow-up: 2,8 years, range: 1-7,04 years), all children presented a central area of chorioretinal atrophy, which extended beyond the macula in 2 of them.

Conclusions:

Despite early diagnosis and treatment of Cbl-C deficit, ocular manifestations in these patients occur early and progress fast, confirming both developmental and degenerative natures of the phenotype. Visual prognosis is always poor and an early path of visual rehabilitation therapy and social support should always be considered.

Abstract 126

MULTIMODAL IMAGING CHARACTERIZATION OF DIFFERENT PHENOTYPES OF ABCA4-RELATED RETINOPATHY

Oral

Lamanna F.*[2], Romano F.[2], Zaffalon C.[1], Invernizzi A.[2], Siligato A.[2], Staurenghi G.[2], Salvetti A.P.[2]

[1]Ophtalmic Unit, Department of Neuroscience, Biomedicine and Movement sciences, University of Verona ~ Verona ~ Italy, [2]Eye Clinic, Department of Biomedical and Clinical Science, Luigi Sacco Hospital, University of Milan ~ Milan ~ Italy

Purpose:

To analyse, by means of multimodal imaging, the retinal and choroidal features of different phenotypes of ABCA4-related retinopathy, including cone dystrophy (COD), cone-rod dystrophy (CORD), Stargardt disease (STGD), late-onset Stargardt (LO-STGD) and fundus flavimaculatus (FFM)

Methods:

Our study was designed as observational and cross-sectional. We included 46 consecutive patients (92 eyes) with genetically-confirmed ABCA4 retinopathy. Patients were assigned to the different ABCA4 phenotypes on the basis of clinical and electrophysiology data. They underwent visual acuity, fundus photography, optical coherence tomography, blue-light and near-infrared autofluorescence and 6x6-mm swept-source optical coherence tomography angiography. The following variables were analyzed: central subfoveal and choroidal thickness (CST, SFCT) and atrophy according to the Classification of Atrophy Meeting on OCT; the extent of retinal pigment epithelium (RPE) atrophy and the shape of retinal flecks using autofluorescence; choriocapillaris flow deficits (FlD) on SS-OCTA

Results:

Overall, 13 patients were affected by COD, 3 by CORD, 10 by STGD, 13 by LO-STGD and 7 by FFM. Mean age was 45.8±18.7 years, while mean VA was 51.7±23.5 letters. CORD patients had the worst vision, whereas FFM and LO-STGD patients had higher VA (all $p<0.05$).
Thirty-five patients had RPE atrophy (5.9±8.4 mm 2) which was larger in LO-STGD eyes ($p<0.05$).
Flecks were detected in 85 eyes (93%) with resorbed flecks more frequent in LO-STGD and CORD.
Lastly, patients with LO-STGD had significantly lower SFCT and larger choriocapillaris FlD than other groups ($p<0.05$) with the exception of CORD ($p=0.12$).

Conclusions:

The phenotypes of ABCA4 retinopathy show different clinical and imaging characteristics. COD and STGD patients show mostly photoreceptors' alterations, while CORD and LO-STGD patients carry significant RPE and choriocapillaris damages. These might be important outcome measures to consider for future interventional studies in ABCA4 retinopathy.

Abstract 109

EXTRAFOVEAL RETINAL REMODELLING AS AN EARLY BIOMARKER OF ABCA4-RELATED RETINAL DEGENERATION

Poster

Coppé A.M.*[1], Iarossi G.[1], Falsini B.[1], Lapucci G.[2], Buzzonetti L.[1]

[1]Ospedale Pediatrico Bambino Gesù ~ Rome ~ Italy, [2]Studio Oculistico Coppé ~ Rome ~ Italy

Purpose:

Retinal remodelling (RR) is a common process in inherited retinal dystrophies (IRDs). Studies on animal models (Denilinger B, 2020) indicate that this process is triggered by photoreceptor loss and/or dysfunction. The aim of this study was to evaluate RR in ABCA4-related IRD by using spectral domain optical coherence tomography (SD-OCT).

Methods:

A cohort of children or adolescents affected by IRD, with a clinical Stargardt type I phenotype and an ABCA4 genotype, were examined by SD-OCT. Volumes and thicknesses at the 9 ETDRS retinal fields were measured by a semi-automated segmentation by two different observers. Foveal results were excluded. Relative thicknesses and volumes, expressed by the quantitative ratios between layers were determined. Results were compared with those obtained from an age-matched control group.

Results:

Average thickness and volume of the outer nuclear and retinal ganglion cell layers were reduced ($p < 0.01$) in patients compared to controls. This reduction was independent of genotype severity and age of patients. RR showed a columnar aspect, showing a topographical correspondence between outer and inner pathological changes.

Conclusions:

Extrafoveal RR, as expressed by thinning of outer nuclear and retinal ganglion cell layers with a topographic correspondence, may be an early anatomic biomarker of ABCA4-related IRD. Further studies will clarify if RR with the observed features can be found associated with other genotypes causing juvenile macular degeneration.

Abstract 15

MÜLLER CELLS IN CHOROIDEREMIA: AN OCT-BASED QUANTITATIVE STUDY

Oral

Bianco L.*, Arrigo A., Antropoli A., Berni A., Battaglia Parodi M., Bandello F.

IRCCS San Raffaele Hospital ~ Milan ~ Italy

Purpose:

To quantitatively investigate Müller Cells' morphology in choroideremia (CHM), using a novel OCT-based approach.

Methods:

Observational and cross-sectional study on a series of genetically confirmed CHM cases and healthy controls. All subjects underwent Optical Coherence Tomography (OCT) (Spectralis HRA+OCT, Heidelberg Engineering) and OCT-Angiography (DRI Triton, Topcon Corporation). The following parameters were extracted from OCT scans, using a previously published method: Müller Cells' number, Müller Cells' number per slab, Müller Cells' density, Müller Cells' intensity and Müller Cells' tortuosity. On OCTA reconstructions, vessel density (VD) from the superficial capillary plexus (SCP), deep capillary plexus (DCP) and choriocapillaris (CC) was quantified in the islet of apparently healthy retina.

Results:

Ten eyes of 10 CHM patients and 20 eyes of 20 healthy male controls were included. Our algorithm was able to detect and reconstruct Müller Cells' in all eyes. The mean number of Müller Cells per single slab was of 89.6 for CHM and 203.3 for controls ($p < 0.001$). In the quantitative analysis, CHM is characterized by a reduction of Müller Cells' intensity, density, and tortuosity, when compared to healthy controls. Quantitative Müller Cells' parameters were correlated positively with VD at DCP.

Conclusions:

A reduction of Müller Cells' number and density in CHM can be detected using a novel quantitative OCT-based approach. Müller Cells' morphology in CHM is characterized by a lower tortuosity, reflecting a less complex spatial configuration, maybe linked to a loss in intercellular connections.

Abstract 101

ANOMALIES OF THE RETINAL CAPILLARY PLEXUSES IN ADULT COATS DISEASE ON OCT ANGIOGRAPHY

Oral

Valerie K.*[1], Pedro M.[2], Cedric D.[1], Carlo L.[1], Alain G.[1]

[1]Hôpital Lariboisière, and Université de Paris, Faculté de Médecine Paris-Diderot ~ Paris ~ France, [2]Institut Langevin, ESPCI, CNRS, PSL University ~ Paris ~ France

Purpose:

To describe and quantify the anomalies of the retinal capillary plexuses using Optical Coherence Tomography Angiography (OCTA) in Coats disease.

Methods:

Eleven eyes of 11 patients with adult Coats 'disease compared to 9 fellow eyes and to 6 healthy eyes.
Horizontal bands of contiguous 3x3mm OCT angiograms were acquired from the optic disc to 6 mm temporal to the fovea, through areas of Coats telangiectasia visible on fluorescein angiography (FA) in 9 eyes and through an apparently normal capillary bed in 2. Montages of the superficial vascular plexus (SVP) and the deep capillary complex (DCC) were created.
Main outcome measure: Vascular density (VD) and fractal dimension (FD) of the SVP and the DCC

Results:

The VD was significantly decreased in Coats eyes compared to normal and fellow eyes respectively (SVP: 21.5 vs 29.4 %, p 0.000004 and 30.3%, p 0.000001. DCC, 16.5 vs 23.9%, p 0.0002 and 24.7%, p 0.00001). The FD was also significantly decreased in affected eyes (SVP: 1.796 vs 1.833, p=0.003 and 1.848, p 0,001. DCC: 1.762 vs 1.838, p 0.004 and 1.853, p 0,003). The SVP and DCC's VD was also significantly decreased in areas without Coats telangiectasia on FA. In the areas of Coats telangiectasia, the DCC was coarse dilated and rarefied, forming an incomplete network.

Conclusions:

In Coats disease, the VD and the FD of the retinal capillary plexuses are decreased, including in areas with no visible telangiectasia on FA. The capillary pattern is more disorganized in the DCC than in the SVP.

Abstract 18

OCTA STUDY OF CHOROIDAL VASCULATURE IN OPEN ANGLE GLAUCOMA PATIENTS

Oral

Cennamo G.*, Costagliola C.

Federico II UNIVERSITY ~ Naples ~ Italy

Purpose:

The aim of this prospective study was to examine and measure subfoveal choroidal thickness (SFCT) and
coriocapillary vessel density (CCVD) using respectivly EDI-OCT and OCTA in preperimetric and advanced
glaucomatous eyes, in order to shed light on the vascular pathogenesis of disease
glaucoma disease.

Methods:

In this prospective study, 19 eyes from 19 patients affected by preperimetric glaucoma (PPG) and 18 eyes from 18 patients affected by advanced glaucoma (AG) were studied from Jjanuary 2022 to May 2022 at the University of Naples “Federico II”. These patients had been compared with 20 eyes of 20 healthy subjects that represented the control group.
All subjects underwent a complete ophthalmological examination, including the best-corrected visual acuity (BCVA) evaluation, intraocular pressure (IOP) with Goldman applanation tonometry, biomicroscopy, gonioscopy, central corneal thickness, fundus examination, visual field (VF), Spectral Domain-Optical Coherence Tomography (SD-OCT) and OCT Angiography (OCTA).

Results:

A total of 19 eyes from 19 PPG patients, and 18 eyes from 18 AG patients, and 20 eyes from 20 healthy subjects were included in this observational study. Mean IOP did not differ among the study groups
The SFCT at EDI-OCT was greater in advanced glaucona patients than PPG and controls groups .
At OCTA examination, PPG patients exhibited a statistically significant decrease in the VD of CC with respect to controls in whole image, and AG showed a statistically significant decrease in the VD of CC with respect to PPG patients in whole image, ($p < 0.001$).

Conclusions:

Theese results showed that the reduction in number of vessels in choriocapillary would lead to a decrease in the rate of bloodflow that could cause an increase in the gradient of perfusion pressure in the still permeable vessels of choroidal layer. Therefore the CCVD significantly discriminate glaucoma patients from controls.

Abstract 13

CHARACTERIZING MACULAR EDEMA IN RETINITIS PIGMENTOSA TOWARDS QUANTITATIVE MULTIMODAL IMAGING.

Oral

Arrigo A.*, Aragona E., Antropoli A., Bianco L., Berni A., Saladino A., Bandello F., Battaglia Parodi M.

IRCCS San Raffaele Scientific Institute ~ Milan ~ Italy

Purpose:

To assess the involvement of the inner retina in retinitis pigmentosa (RP) and to investigate the quantitative multimodal imaging features of those eyes complicated by macular edema (ME).

Methods:

The study was designed as prospective case series with 1-year follow-up. All the genetically confirmed RP patients underwent complete ophthalmologic assessment, structural optical coherence tomography (OCT), OCT angiography (OCTA) and microperimetry (MP). All the clinical and imaging data were statistically analyzed to unveil significant differences and correlations. The primary outcome was the quantitative multimodal imaging characterization of RP eyes complicated by ME.

Results:

We included 68 eyes (68 RP patients) and 68 healthy eyes (68 controls). Mean BCVA was 0.14±0.17 LogMAR at baseline and 0.18±0.23 LogMAR at 1-year follow-up ($p>0.05$). Eighteen RP eyes showed ME, with a mean ME duration of 8 ± 4 months. Most of the eyes were characterized by recurrent ME. All the eyes showed a main localization of the ME at the level of the inner nuclear layer (INL). LogMAR BCVA was similar between RP eyes with or without ME. RP eyes with ME showed higher vessel density values and thicker choroid, compared with RP eyes without ME.

Conclusions:

Inner retina has a major role in characterizing the retinal morpho-functional status in RP. The presence of ME did not influence the visual function. Inner nuclear layer is highly involved in the pathogenesis of ME.

Abstract 57

X-LINKED JUVENILE RETINOSCHISIS: CLINICAL AND SWEPT SOURCE OPTICAL COHERENCE TOMOGRAPHY FINDINGS

Poster

Rym M.*, Safa B.A., Zeineb G., Meriem O., Monia C.

Hospital Habib Thameur Tunis ~ Tunis ~ Tunisia

Purpose:

To describe clinical and swept source optical coherence tomography (SS OCT) findings in eyes with X-linked juvenile retinoschisis

Methods:

A retrospective case series of 5 patients (10 eyes) with X-linked juvenile retinoschisis. All patients underwent a detailed ophthalmic examination, fundus photography and SS OCT

Results:

Mean age of patients was 17.4 years. Mean initial visual acuity was 20/50. Clinical findings included cataract in 4 eyes, stellar microcystic macular appearance in 7 eyes, peripheral intraretinal cysts in 4 eyes, retinal pigmented epithelium changes in 3 eyes, peripheral sheathed vessels in 3 eyes, peripheral tractional veils in 3 eyes, peripheral exudation in 1 eye, retinal detachment in 1 eye and vitreous hemorrhage in 1 eye. SS OCT scan of the macula showed the presence of intraretinal cysts in 9 eyes associated to ellipsoid zone disruption in 1 eye and macular detachment in 1 eye.

Conclusions:

X-linked juvenile retinoschisis is a leading cause of hereditary juvenile macular degeneration in males resulting in significant vision impairment. The diagnosis is based on clinical features, electroretinography findings and genetic tests. OCT, a non-invasive imaging modality, has a diagnosis and prognosis interest in this uncommon disease.

Abstract 148

SWEPT SOURCE OPTICAL COHERENCE TOMOGRAPHY IN FUNDUS ALBIPUNCTATUS

Poster

Rym M.*, Olfa B., Zeineb S., Zeineb G., Meriem O., Monia C.

Hospital Habib Thameur Tunis ~ Tunis ~ Tunisia

Purpose:

To describe swept source optical coherence tomography (SS-OCT) characteristics in a case of Fundus albipunctatus

Methods:

A single case report

Results:

A 28-year-old healthy male with a family history of fundus albipunctatus, was summoned for a systematic ophthalmic examination. There was no history of night blindness. Best-corrected visual acuity was 20/30 in the right eye and 20/25 in the left eye. The corneas, lenses, and anterior chambers were unremarkable. Fundus examination revealed numerous small, white-yellowish retinal lesions within the posterior pole. SS-OCT showed numerous dome-shaped hyperreflective formations spanned across the retinal pigment epithelium. This spike like deposits were extended into the IS/OS junction of the photoreceptors and the external limiting membrane with a focal loss in the photoreceptor outer segments.

Conclusions:

Fundus albipunctatus is a rare form of stationary night blindness characterized by early hemeralopia beginning in early childhood. The use of SS-OCT may be of value in showing highly suggestive findings.

Abstract 151

INTEREST OF OCT-A ANALYSIS FOR THE DIAGNOSIS OF BEST DISEASE CHOROIDAL NEW-VESSELS.

Oral

Favard C.*[1], Meunier I.[1], Mauget--Faysse M.[2]

[1]Centre ophtalmologique de l'Odéon ~ Paris ~ France, [2]~ PARIS ~ France

Purpose:

Best disease is frequently complicated by choroidal new vessels (CNV) which are often difficult to diagnose. We present here a small series of 6 members of a same family who were retrospectively studied to evaluate OCTA contribution to the diagnosis and follow up of neovascular complications in Best disease.

Methods:

Between October 2011 and March 2022, twelve eyes of six members of a same family presenting Best disease were studied using multimodal examination: visual acuity (VA), colour eye fundus pictures, FA, ICG, OCT and OCTA. These patients were also genetically studied.

Results:

All 6 members of the family presented a pathogen variant of BEST1 gene. Seven eyes presented CNVs with type 2 in 6 eyes. On OCTA, all the 5 CNVs observed in children presented a well delineated CNV network with tortuous newvessels surrounded by an hyposignal ring. After intravitreal bevacizumab treatment, CNV size appeared to decrease on OCTA. The 67 years old grandfather presented polypoidal choroidal vasculopathy (PCV) in 1 eye which required aflibercept injections and photodynamic therapy. After antiVEGF treatment, VA was stable in 4 eyes and gained 3 lines or more in 3 eyes.

Conclusions:

OCTA appears very contributive to the diagnosis of Best disease CNVs with type 2 CNVs characteristics in young patients. However, in elder subjects AMD type CNVs can be observed like in our case of PCV. Treatment can be monitored by OCTA and antiVEGF appear efficient to preserve visual prognosis

Abstract 162

SPECTRAL-DOMAIN OPTICAL COHERENCE TOMOGRAPHY ANALYSIS IN SYNDROMIC AND NONSYNDROMIC FORMS OF RETINITIS PIGMENTOSA DUE TO USH2A GENETIC VARIANTS

Oral

Rissotto R.*, Colombo L.

Department of Ophthalmology, ASST Santi Paolo e Carlo Hospital, University of Milan ~ Milan ~ Italy

Purpose:

This study aimed to analyze macular structure by using spectral-domain optical coherence tomography (SD-OCT) in a cohort of patients affected by autosomal recessive retinitis pigmentosa and Usher syndrome, due to genetic variants in USH2A gene, and to correlate optical coherence tomography (OCT) parameters with functional and genetic data.

Methods:

The subjects of this study were 92 patients, 46 syndromic (Usher syndrome type IIa [Ush2]) and 46 nonsyndromic (autosomal recessive RP [arRP]), with clinical and genetic diagnosis of USH2A-related retinal dystrophy, who underwent a complete ophthalmic examination and spectral-domain OCT analysis. The study focused on evaluating the differences between the 2 groups in the following parameters: best-corrected visual acuity (BCVA), ellipsoid zone (EZ) width, presence of epiretinal membrane (ERM), and cystic macular lesions (CMLs). Variants in USH2A gene were divided into 3 categories, according to the expected impact (low/high) at protein level of the different variants on each allele.

Results:

BCVA and EZ width were significantly lower in Ush2 than in arRP patients ($p<0.0001$ and $p=0.001$). ERM was detected in 34.8% (16/46) of arRP patients and in 65.2% (30/46) of Ush2 patients ($p=0.003$). CML was detected in 17.4% (8/46) of arRP patients and 30.4% (14/46) of Ush2 patients ($p=0.14$). The allelic distribution was statistically different ($p=0.0003$) by dividing the 2 diseases: for Ush2 patients it was 45.7% (high/high), 39.1% (low/high) and 15.2% (low/low); for arRP patients it was 8.7% (high/high), 56.5% (low/high), and 34.8% (low/low). The severity class of the variants significantly affected visual acuity and EZ width parameters.

Conclusions:

Retinal disease, as evaluated by means of SD-OCT, shows more advanced degeneration signs in the syndromic than the non-syndromic form of retinal dystrophy related to USH2A gene. However, since the 3 allelic profiles can be found in both Usher and RP patients, other factors must necessarily play a determining role.

Abstract 152

ADAPTIVE OPTICS IMAGING CHARACTERISTICS OF VARICELLA ZOSTER VIRUS NODULAR PERIARTERITIS

Oral

Dolci M.P.*[1], Milella P.[1], Leone G.[1], Mapelli C.[2], Nassisi M.[1], Ruggi G.[3], Casalino G.[2], Scialdone A.[3], Viola F.[1]

[1]Department of Clinical Sciences and Community Health, University of Milan, Milan, Italy ~ Milan ~ Italy, [2]Ophthalmological Unit, Fondazione IRCCS Ca' Granda Ospedale Maggiore Policlinico di Milano, Milan, Italy ~ Milan ~ Italy, [3]Fatebenefratelli and Oftalmico Hospital, ASST Fatebenefratelli Sacco, Milan, Italy ~ Milan ~ Italy

Purpose:

Retinal segmental periarteritis is a rare condition in which white-yellowish exudates are placed in beaded pattern within the retinal arteries. The aim is to report the adaptive optics (AO) imaging characteristics of arterial vasculitis in Varicella Zoster Virus (VZV) related posterior uveitis and correlate it with other imaging modalities

Methods:

Patients diagnosed with VZV posterior uveitis and evidence of retinal segmental periarteritis underwent multimodal imaging including fluorescein angiography (FA), indocyanine green angiography (ICGA), optical coherence tomography (OCT) and AO

Results:

3 patients (1 female; median age 78 years) were recruited. In all cases, AO images showed arterial wall involvement, perivascular opacification, and focal lumen irregularities. However, the arterial walls were never disrupted. There was no vein involvement. In one case, glistening whitish spots were evident on the surface of the arterial wall, which corresponded to an intense hyperreflectivity on OCT and late focal hypofluorescence on FA and ICGA. In general, arterial plaques showed late iso/hypofluorescence on FA and ICGA. In all cases, arterial plaques modifications were far more evident on AO than angiographic exams

Conclusions:

AO imaging confirms that nodular periarteritis involves arterial walls, but it remains confined within them. Furthermore, AO seems more sensitive to detect vascular inflammation at microscopic level than traditional imaging. Additional studies will be needed to further explore the diagnostic and prognostic value of these findings

Abstract 24

FUNDUS AUTOFLUORESCENCE IN EXTENSIVE MACULAR ATROPHY WITH PSEUDODRUSEN (EMAP) AND DIFFUSE TRICKLING GEOGRAPHIC ATROPHY (DTGA)

Oral

Saladino A.*, Antropoli A., Bianco L., Arrigo A., Battaglia Parodi M., Bandello F.

San Raffaele Hospital ~ Milan ~ Italy

Purpose:

To establish whether Extensive Macular Atrophy with Pseudodrusen (EMAP) has a specific shape pattern on blue-light autofluorescence (BAF) with respect to Diffuse Trickling Geographic Atrophy (DTGA) and non-DTGA secondary to age-related macular degeneration.

Methods:

We reviewed our prospectively maintained database to enroll patients with a diagnosis of EMAP, DTGA or non-DTGA and a minimum follow-up of 1 year. Atrophic areas and progression rates were calculated on BAF images (Spectralis HRA+OCT) using Region Finder tool. Circularity, roundness, and homogeneity were chosen as shape descriptors and extracted using ImageJ. Variables were compared between disease groups using Kruskal-Wallis test.

Results:

A total of 28 EMAP, 27 DTGA and 30 non-DTGA eyes were included in the analysis. Median follow-up time was around 3.5 years, not significantly different between groups. EMAP was characterized by a fast BCVA loss (0.14 logMAR/year) and atrophy expansion (1.04 mm/year) and by a low circularity, roundness, and homogeneity, albeit similar to DTGA. On the other hand, EMAP and non-DTGA significantly differed in terms of atrophy progression rate, circularity, roundness, and homogeneity.

Conclusions:

Our study found that EMAP and DTGA display very similar features on autofluorescence: the macular atrophic area has a fast progression, fringed borders, elongated shape, and a non-homogeneous fluorescent signal.

Abstract 34

QUANTITATIVE ASSESSMENT OF CHORIOCAPILLARIS FLOW DEFICITS AND TYPE 1 MACULAR NEOVASCULARIZATION GROWTH IN AGE-RELATED MACULAR DEGENERATION

Oral

Cabral D.*[1], Fradinho A.[2], Zhang Y.[3], Hao Zou D.[3], Ramtohul P.[1], Wang R.K.[3], Freund K.B.[1]

[1]VRM ~ New York ~ United States of America, [2]NMS Research ~ Lisbon ~ Portugal, [3]Department of Bioengineering, University of Washington ~ Seattle ~ United States of America

Purpose:

To evaluate the association between choriocapillaris (CC) flow deficits (FD) and growth patterns of type 1 macular neovascularization (MNV) in eyes with age-related macular degeneration (AMD).

Methods:

Retrospective, consecutive case series of AMD eyes with exudative or nonexudative type 1 MNV exhibiting growth on swept-source optical coherence tomography angiography (SS-OCTA) over a minimum follow-up of 12 months. MNV growth pattern and two types of quantitative CC FD measurements [FD average size and FD percentage (%)] from the visit preceding neovascular growth were assessed using radial sectors spanning a concentric 600 µm ring surrounding the MNV outline. MNV growth and FD measurements from each pair of visits were plotted, and the strength of the association evaluated using Kendall's rank-order correlation.

Results:

Twenty-two eyes from 19 patients were evaluated, of which 4 eyes had non-exudative lesions and 5 eyes had treatment naïve exudative type 1 MNV. The mean follow-up interval was 28 ± 3 months and the median interval between SS-OCTA visits was 18 ± 25 months (quartile 1 = 10; quartile 3 = 35). There was an overall weak correlation between type 1 MNV growth and CC FD average size (τ = 0.18) and a moderate correlation with CC FD % (τ = 0.20).

Conclusions:

In AMD eyes with type 1 MNV, lesions grow preferentially into CC areas with an increased FD average size and increased FD%, supporting the concept that type 1 MNV recapitulates areas of CC blood flow impairment.

Abstract 68

TOPOGRAPHICAL ANALYSIS OF THE CHORIOCAPILLARIS REPERFUSION AFTER LOADING ANTI-VEGF THERAPY IN NEOVASCULAR AMD

Oral

Viggiano P.*, Grassi M.O., Alessio G., Boscia G., Boscia F.

University of BARI "Aldo Moro" ~ Bari ~ Italy

Purpose:

To evaluate choriocapillaris vascular density changes around macular neovascularization (MNV) before and after anti-vascular endothelium growth factor (VEGF) injections by optical coherence tomography angiography (OCTA).

Methods:

Treatment-naïve eyes with a diagnosis of exudative AMD and type 1 MNV were included. En face optical coherence tomography angiograms were analyzed for percentage of CC FD (FD%), the FD average area (FDa), and the FD number (FDn) in five progressive 200-µm-wide concentric rings (R1, R2, R3, R4, and R5) surrounding the dark halo around MNV. The OCTA acquisition was performed at the following visits: (i) before the loading phase (LP) of intravitreal injection of aflibercept or ranibizumab (T1), (ii) 1 month after the last intravitreal injection of LP comprising three monthly injections (T2).

Results:

A total of 30 eyes of 30 Caucasian patients with nAMD naïve were included in the study. All rings showed a progressive FD% reduction at T2 in comparison to T1 values indicating gradual CC reperfusion of the peripheral rings. Furthermore, we found a progressive contraction of the FD average area in all the rings considered ($p < 0.05$). On the other hand, at T2, a significant increase in the FD number of the five rings was displayed, as compared to T1 ($p < 0.05$).

Conclusions:

Our analysis showed topographical CC reperfusion after loading anti-VEGF therapy. CC flow deficits were greater around the associated dark halo before treatment, followed by a progressive recovery of CC flow after intravitreal therapy.

Abstract 51

SPONTANEOUSLY RESOLVING MASSIVE SUBMACULAR BLEED WITH BREAKTHROUGH VITREOUS HAEMORRHAGE, SECONDARY TO POLYPOIDAL CHOROIDAL VASCULOPATHY

Poster

Bhattacharya S.*, Thakar M.

Guru Nanak Eye Centre ~ New Delhi ~ India

Purpose:

To report the case of a 56 year-old healthy male, who suddenly developed a massive submacular bleed with vitreous hemorrhage, which surprisingly resolved in its own. Multimodal imaging later revealed the cause.

Methods:

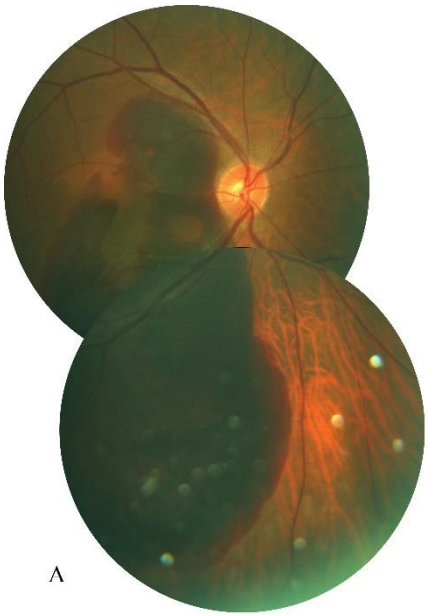
A 56-year-old healthy male presented with sudden painless decrease of vision in his right eye and he had been diagnosed with choroidal nevus elsewhere. Vision was OD counting fingers at one meter and OS 6/6. On examination, his right fundus had a massive submacular bleed extending up to the periphery (FigA), while the fellow eye being normal. This was complicated by a rapidly developing vitreous hemorrhage (FigB), but unfortunately, the patient was lost to follow up due to the lockdown. He presented 2 months later, and his condition had resolved spontaneously with a corrected vision of 6/60 (FigF).

Results:

SDOCT of the same eye now showed a dome-shaped subretinal elevation and scarring (FigC&D), and OCT-Angiography revealed branching vascular network, at the level of Bruch's membrane, with no current activity (FigE). A diagnosis of macular scarring secondary to Polypoidal choroidal vasculopathy (PCV) was made and the patient was kept on close follow up. In PCV, the inner choroidal vascular network has an aneurysmal bulge that may be seen as polyps. These dilated vessels may leak causing serous pigment epithelial detachments (PED) while serosanguinous PEDs and neurosensory retina detachments may be the features of haemorrhagic PCV.

Conclusions:

Half of patients with PCV remain stable with relatively favourable outcomes, while the others have persistent leakage, recurrent haemorrhages, and poor outcomes. Further research is needed on this topic, guided with multimodal imaging.



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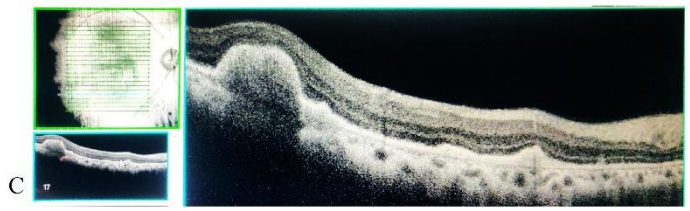

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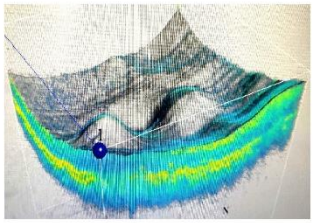

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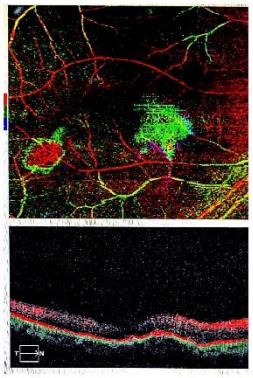

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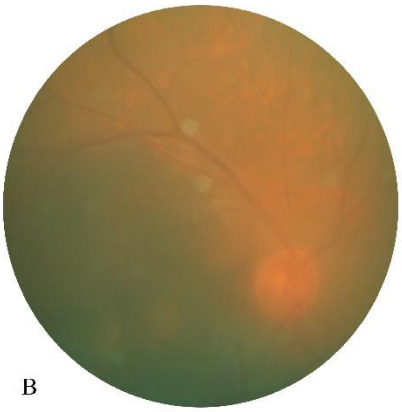

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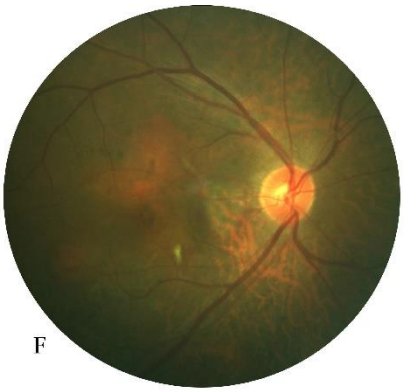


F

Abstract 123

DIFFERENCES IN LONG-TERM PROGRESSION OF ATROPHY BETWEEN NEOVASCULAR AND NONNEOVASCULAR AGE-RELATED MACULAR DEGENERATION

Oral

Airaldi M.*[1], Corvi F.[1], Cozzi M.[1], Muneeswar G.N.[2], Staurenghi G.[1], Srinivas R.S.[2]

[1]Eye Clinic, Department of Biomedical and Clinical Science "Luigi Sacco" Sacco Hospital, University of Milan ~ Milan ~ Italy, [2]Doheny Eye Institute, University of California at Los Angeles ~ Los Angeles, CA ~ United States of America

Purpose:

To compare the enlargement rates of geographic atrophy (GA) over 5 years of follow-up with those of macular atrophy (MA) associated with macular neovascularization (MNV).

Methods:

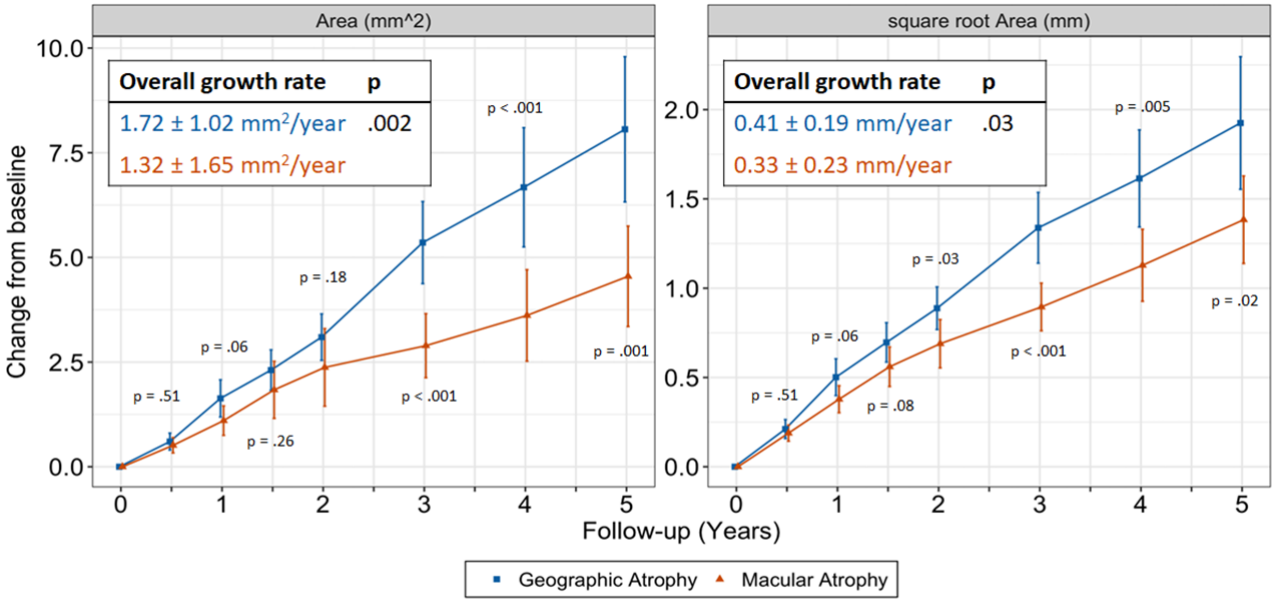
Retrospective, longitudinal, comparative and consecutive case series of patients with age-related macular degeneration and GA (dry) or with MA and MNV. Atrophic regions detected on serial registered fundus autofluorescence images were semiautomatically delineated, and the measurements of these areas were recorded every 6 ± 3 months for the first 2 years of follow-up and at yearly intervals for up to 5 years. Main outcome measures were the annual raw and square root-transformed rates of atrophy growth.

Results:

117 eyes of 95 patients (61 in the GA and 56 in the MA cohort); 100% and 38.5% completed 2 and 5 years of follow-up. Baseline size was similar between the 2 groups (raw: 1.74 vs. 1.53 mm^2, P = 0.56; sqrt: 1.17 vs. 1.02 mm, P = 0.26). Enlargement rates were greater for the GA cohort (raw: 1.72 vs. 1.32 mm2/year, P = 0.002; sqrt: 0.41 vs. 0.33 mm/year, P = 0.03), and so was the area of atrophy growth at 5 years (raw: +8.06 vs. +4.55 mm2, P = 0.001; sqrt: +1.93 vs. +1.38 mm, P = 0.02).

Conclusions:

The presence of MNV was associated with a slower rate of expansion, resulting in overall smaller areas of atrophy over time. These findings support the hypothesis that MNV may protect against the progression of atrophy.


Area (mm^2)
square root Area (mm)
Overall growth rate p
1.72 ± 1.02 mm²/year .002
1.32 ± 1.65 mm²/year
Overall growth rate p
0.41 ± 0.19 mm/year .03
0.33 ± 0.23 mm/year
Change from baseline
Follow-up (Years)
p = .51
p = .06
p = .26
p = .18
p < .001
p < .001
p = .001
p = .51
p = .06
p = .08
p = .03
p < .001
p = .005
p = .02
Geographic Atrophy
Macular Atrophy

Abstract 161

THE IMPACT OF OCT DOUBLE LAYER SIGN CHARACTERISTICS ON LONG TERM VISUAL PROGNOSIS OF PATIENTS WITH NON-EXUDATIVE AGE RELATED MACULAR DEGENERATION

Oral

Mavi Yildiz A.*

Bursa Retina Eye Hospital ~ Bursa ~ Turkey

Purpose:

To assess the predictive value of optical coherence tomography (OCT) double layer sign (DLS) features on subclinical, non-exudative macular neovascularisation (NE-MNV) and visual prognosis in patients with non-exudative age-related macular degeneration (NE-AMD).

Methods:

48 patients with DLS on OCT who were diagnosed with NE-AMD between 2016-2020 were included. The minimum follow-up was 12 months. The presence of NE-MNV on OCT angiography, the maximum area of the DLS and type 1 MNV on en-face structural OCT, the thickness of the choroid beneath the DLS, and its topographically symmetrical area with respect to the horizontal raphe on EDI-OCT and the maximum base width and height of the DLS were recorded. The relationship between the features of the 'double layer sign' and the presence and exudation rates of NE-MNV during the follow-up period were recorded.

Results:

The mean age was 75.9±7.5 years. The mean follow-up period was 20.9±9.5 months. NE-MNV was detected in 83.3% of the patients and signs of exudation were observed in 30% of these cases. The mean area of 'DLS and MNV were 3.1±3.6 (0.1-13.2) mm2 and 2.9±2.9 (0.4-10.0) mm2 respectively. The thickness of the sub-DLS and topographically symmetrical choroid were 301.4±74.1 µm and 221,9±64,3 µm respectively ($p<0.001$). The base width and height of the DLS were 1895.0±1114.6 µm and 105.5±50.2 µm respectively. The mean area and base width of the 'DLS were significantly correlated with the presence exudation rate of MNV ($p<0.05$).

Conclusions:

A significant correlation of 70-85% has been reported between the type 1 MNV and DLS in AMD cases. Upon the current literature, our study revealed that the base width and the area of the DLS are also significant predictive features to estimate the presence and exudation rate of NE-MNV.

Abstract 4

SHORT-TERM MORPHO-FUNCTIONAL CHANGES IN PREVIOUSLY TREATED NEOVASCULAR AMD EYES SWITCHED TO BROLUCIZUMAB

Oral

Viggiano P.*[1], Grassi M.O.[1], Boscia G.[2], Borrelli E.[3], Pignataro M.G.[1], Petruzzella G.[1], Alessio G.[1], Boscia F.[1]

[1]university of Bari ~ Bari ~ Italy, [2]university of Turin ~ Turin ~ Italy, [3]university of milan, san raffaele Hospital ~ milan ~ Italy

Purpose:

To explore the morpho-functional fluctuations in eyes treated for nAMD when switched from aflibercept or ranibizumab to brolucizumab.

Methods:

31 eyes of 31 patients with nAMD with type 1 MNV were included.All patients were imaged using the SD-OCT.The OCT acquisition was performed at the following visits:(i)T1 visit corresponding to the last follow-up examination in which an intravitreal injection of aflibercept or ranibizumab was performed before switching to brolucizumab because of the lack of improvement,(ii)T2 visit corresponding to the examination performed 1 month after T1, the latter visit corresponding to the day when a switch to brolucizumab injection was performed, (iii) and 1 month after the latter injection (T3).The main outcome measures were:(1)Central macular thickness,(2)choroidal vascularity index(CVI) and,(3)subfoveal choroidal thickness.

Results:

CMT analysis showed fluctuations at 3 times. In detail,T2 displayed a thicker CMT in comparison to T1, although not statistically significant(p= 0.12). Contrariwise,T3 showed a thinner CMT in comparison to T2 (p= 0.002).Analyzing CVI among the three different times, the LCA and TCA showed significantly different values before and after switching to brolucizumab.T2 showed a significant reduction in both vessel lumen and total area compared to T1 (p= 0.032 and p = 0.046, respectively).Moreover, T3 showed a greater value of both LCA and TCA in comparison to T2 (p= 0.008 and p = 0.01, respectively).CT did not show significant differences at each time (P>0.05)

Conclusions:

Our results reported early experiences on morpho-functional fluctuations in patients with nAMD switched to brolucizumab. The anatomical impact of brolucizumab administration appears to result in more effective resolution of SRF and IRF, in association with choroidal vascular enlargement.

Abstract 201

AUTOMATED DETECTION OF SMALL HYPERREFLECTIVE SPECKS AND FLECKS IN NON-NEOVASCULAR AGE-RELATED MACULAR DEGENERATION USING ULTRAHIGH RESOLUTION OPTICAL COHERENCE TOMOGRAPHY

Oral

Won J.*[1], Reimann M.[1], Takahashi H.[2], Yaghy A.[2], Lin J.[1], Girgis J.[2], Lam K.[2], Hwang Y.[1], Chen S.[1], Waheed N.[2], Fujimoto J.[1]

[1]Massachusetts Institute of Technology ~ Cambridge ~ United States of America, [2]New England Eye Center ~ Boston ~ United States of America

Purpose:

Hyperreflective foci are associated with the progression of non-neovascular age-related macular degeneration (AMD). The purpose of this study was to evaluate the ability of ultrahigh resolution spectral domain OCT (UHR SD-OCT) to detect the presence of smaller hyperreflective features, such as specks and flecks, in volumetric datasets.

Methods:

Adult participants with age-matched healthy macula (n=15), early AMD (n=20), and intermediate AMD (n=48) were enrolled in the study. An UHR SD-OCT prototype instrument with an axial resolution of ~2.7µm and an extended imaging range was utilized to acquire high-definition volumetric datasets over 9mm by 6mm with an A-scan spacing of 5µm. An automated, local peak-detection algorithm was developed to extract and quantitatively assess hyperreflective specks and flecks. The algorithm outputs were compared to manual labeling to evaluate detection accuracy. En face projections of outer retinal layers were compared with en face map of the detected hyperreflective features.

Results:

High-definition volumetric acquisition of UHR SD-OCT revealed the presence of small (~5µm) hyperreflective features with varying shapes and reflectivity. Hyperreflective features were detected in the outer nuclear layer and external to the external limiting membrane from age-matched healthy, early AMD, and intermediate AMD eyes. The algorithm generated en face map of the detected hyperreflective features, as well as their relative location in depth and quantity. The number of detected small hyperreflective features in age-matched healthy eyes was much lower than that in eyes with AMD.

Conclusions:

Hyperreflective specks and flecks, along with the conventional hyperreflective foci, are potentially quantifiable using the UHR SD-OCT and the automated detection. Longitudinal monitoring of small hyperreflective features and their neighboring lesions may help to develop biomarkers for disease progression in patients with AMD.

Abstract 42

REAL WORLD PERFORMANCE OF AI, HUMAN AND HYBRID SCREENING SYSTEMS FOR DIABETIC RETINOPATHY

Oral

Leng T.*

Byers Eye Institute at Stanford, Stanford University School of Medicine ~ Palo Alto ~ United States of America

Purpose:

To evaluate a commercial artificial intelligence (AI) system and human-based grading, as well as a hybrid model on their ability to detect more than moderate non-proliferative diabetic retinopathy (MTMDR) in a primary care clinic setting.

Methods:

Primary care patients were screened with remote teleophthalmology at seven sites over 2.5 years. During the teleophthalmology phase, single-reader evaluation was used to classify images. During the AI phase, an FDA-cleared device (IDx-DR, Digital Diagnostics), cloud-based AI models assessed image quality prior to clinical evaluation. If the image was gradable, the AI indicated the presence or absence of MTMDR, and/or DME, in at least one eye. Patients who received a MTMDR or ungradable result were referred to an ophthalmologist for in-person examination. Some patients participated in in-person examinations and those exams were used to validate the performance of both workflows.

Results:

2,012 exams were performed (790 teleophthalmology, 1222 AI). Images were gradable in 90.3% of teleophthalmology and 62.5% of AI. Gradable encounters resulted in MTMDR in 5.6% of teleophthalmology and 19% of AI. Overreads of AI images compared to in-person had 91.8% accuracy with 69.5% sensitivity and 96.9% specificity. Moreover, AI had a 70.0% accuracy with a 95.5% sensitivity and 60.3% specificity when compared to in-person. When the DR stages were expanded beyond MTMDR-positive or -negative, the agreement between retina specialist overread and in-person examination was 83.3%, and 96.5% of encounter diagnoses were within one DR stage of each other.

Conclusions:

While both teleophthalmology and AI-based screening approaches demonstrate high accuracy, the sensitivity of AI exceeded that of the retina specialists, whereas the specificity of retina specialists exceeded the AI, possibly caused by imaging artifacts.

Abstract 177

HENLE'S FIBER LAYER SEGMENTATION WITH DEEP LEARNING ALGORITHMS

Oral

Kesim C.*[1], Cansiz S.[2], Guleser U.Y.[1], Bektas S.N.[3], Kulali Z.[3], Gunduz--Demir C.[2], Hasanreisoglu M.[1]

[1]Department of Ophthalmology, Koç University School of Medicine ~ Istanbul ~ Turkey, [2]Department of Computer Engineering, Koç University Faculty of Engineering ~ Istanbul ~ Turkey, [3]Koç University School of Medicine ~ Istanbul ~ Turkey

Purpose:

Henle's Fiber Layer (HFL) is a retinal layer which can be visualized through its diverse reflectivity pattern that can be acquired by directional optical coherence tomography (D-OCT). In this study we aimed to compare two separate deep learning algorithms that can detect HFL from standard OCT and D-OCT images.

Methods:

Manual HFL segmentation was performed from 20x20 degrees macular D-OCT images of healthy subjects. Two deep neural networks with a UNet architecture (standard-UNet and directional-UNet) were designed and trained to predict current segmentations from standard OCT and D-OCT images. To output a segmentation map, the standard-UNet took only a standard OCT image while the directional-UNet took directional OCT images along with the standard OCT as input. The algorithms were validated on a separate dataset consisted of OCT images of healthy subjects that were not used in training.

Results:

From OCT acquired eyes, 20 were used for training and 23 were used for validation. The trained standard-UNet and directional-UNet algorithms detected HFL with 70.72% and 72.27% sensitivity, 99.69% and 99.69% specificity, and 77.32% and 78.51% f-scores, respectively. Figure 1 shows a sample OCT section with segmentation results. The total HFL volume and mean HFL thickness calculated on validation data were 0.65+/-0.10 mm3 and 23.1+/-3.57 µm for standard-UNet and 0.67+/-0.11 mm3 and 23.6+/-3.80 µm for directional-UNet, respectively. Figure 2 shows sample heat maps created by manual and automated HFL segmentations.

Conclusions:

Automated HFL segmentation can be performed by deep learning algorithms from both standard OCT and D-OCT images.

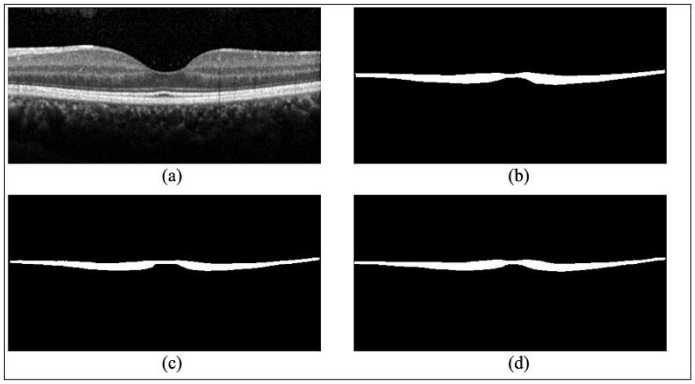


Figure 1 (*above*): Henle's Fiber Layer (HFL) segmentation of a sample optical coherence tomography (OCT) section. (a) Standard OCT, (b) manual HFL segmentation, (c) automated HFL segmentation performed by the standard-UNet algorithm, (d) automated HFL segmentation performed by the directional-UNet algorithm.

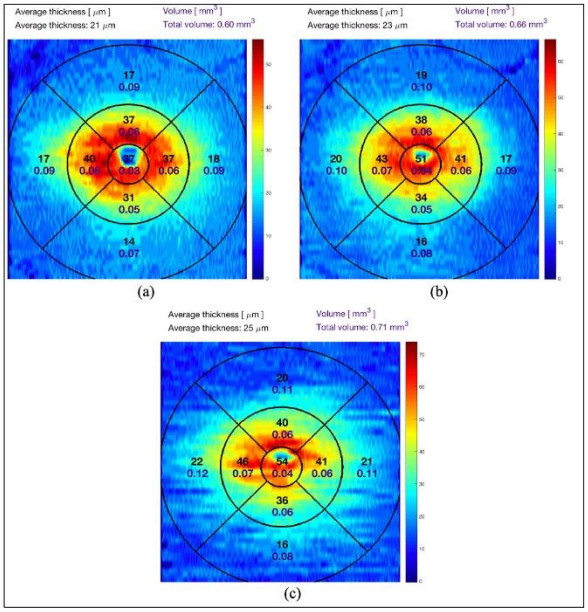


Figure 2 (*right*): Henle's Fiber Layer (HFL) thickness heat maps calculated from sample optical coherence tomography (OCT) images. Heat maps created from automated segmentations performed by (a) standard-UNet and (b) directional-UNet algorithms are shown. (c) HFL thickness heat map based on manual HFL segmentation.

Abstract 124

BEYOND AI - HUMAN-CENTERED COMPUTING IN OPHTHALMOLOGY

Oral

Huang S.*

Retina Center of Ohio ~ Cleveland ~ United States of America

Purpose:

To highlight advances in human-centered computing (HCC) in ophthalmology. The rapid acceleration of artificial intelligence (AI), deep learning (DL), and human-machine interfaces pose great potential as well as challenges for adoption into clinical practice. This presentation will highlight current and emerging translational research in ophthalmology and retinal disease.

Methods:

The current literature on artificial intelligence and deep learning will be reviewed with a focus on clinical implementation. Diabetic retinopathy, macular degeneration, and retinopathy of prematurity programs will be highlighted. A summary of the proceedings of the Future Vision Forum (Oct 31-Nov 1, 2022) which will highlight unmet needs, challenges, priorities, and future areas of investigation.

Results:

Despite the immense promise of multiple platforms using AI as a tool to screen, classify, and triage existing conditions, many concerns exist. Markers for validity and statistical significance have been called into question. Machine learning algorithms have the potential to move beyond screening programs to identify at-risk populations for disease progression and therapeutic intervention. Patient and physician confidence is a major barrier to adoption. Financial modeling of AI/ML programs is complex due to limited natural history data, variable costs, and evolving technology.

Conclusions:

HCC, AI, and ML are revolutionizing healthcare. Integration of this technology faces many challenges. Widespread adoption will depend upon robust financial modeling, healthcare systems that can benefit from cost savings, identification of accurate biomarkers for disease progression, and confidence from end-users in the validity of treatment outcomes.

Abstract 75

AUTOMATED MACHINE LEARNING-BASED CLASSIFICATION OF PROLIFERATIVE AND NON-PROLIFERATIVE DIABETIC RETINOPATHY USING OPTICAL COHERENCE TOMOGRAPHY ANGIOGRAPHY VASCULAR DENSITY MAPS

Oral

Khalili Pour E.*[1], Rezaee K.[2], Azimi H.[3], Mirshahvalad S.M.[1], Jafari B.[1], Fadakar K.[1], Faghihi H.[1], Mirshahi A.[1], Ghassemi F.[1], Ebrahimiadib N.[1], Mirghorbani M.[1], Bazvand F.[1], Riazi--Esfahani H.[1], Riazi Esfahani M.[4]

[1]Farabi Eye Hospital ~ Tehran ~ Iran, Islamic Republic of, [2]Department of Biomedical Engineering, Meybod University, Meybod, Iran ~ Yazd ~ Iran, Islamic Republic of, [3]Faculty of Mathematical Sciences and Computer, Kharazmi University, Tehran, Iran ~ Tehran ~ Iran, Islamic Republic of, [4]Department of Ophthalmology, Gavin Herbert Eye Institute, University of California Irvine, Irvine, CA, USA ~ Irvine ~ United States of America

Purpose:

The study aims to classify the eyes with proliferative diabetic retinopathy (PDR) and non-proliferative diabetic retinopathy (NPDR) based on the optical coherence tomography angiography (OCTA) vascular density maps using a supervised machine learning algorithm.

Methods:

OCTA vascular density maps (at superficial capillary plexus (SCP), deep capillary plexus (DCP), and total retina (R) levels) of 148 eyes from 78 patients with diabetic retinopathy (45 PDR and 103 NPDR) was used to classify the images to NPDR and PDR groups based on a supervised machine learning algorithm known as the support vector machine (SVM) classifier optimized by a genetic evolutionary algorithm.

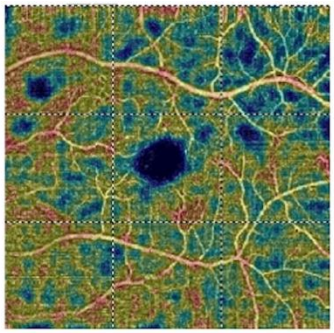
Results:

The implemented algorithm in three different models reached up to 85% accuracy in classifying PDR and NPDR in all three levels of vascular density maps. The deep retinal layer vascular density map demonstrated the best performance with a 90% accuracy in discriminating between PDR and NPDR.

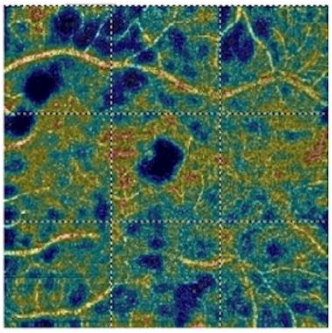
Conclusions:

The current study on a limited number of patients with diabetic retinopathy demonstrated that a supervised machine learning-based method known as SVM can be used to differentiate PDR and NPDR patients using OCTA vascular density maps.

(1)



(a)



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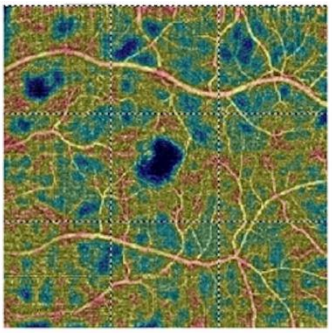

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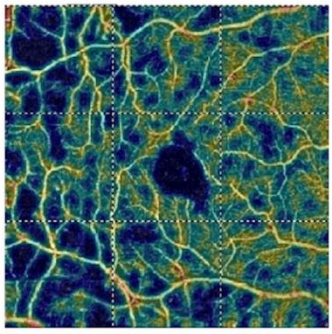

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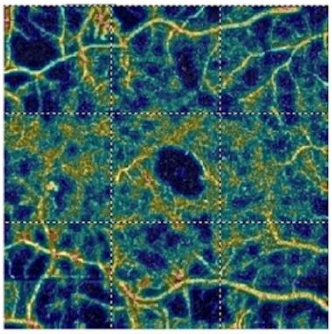

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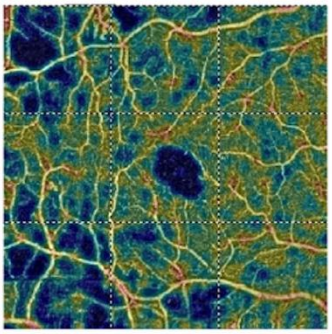


(f)

Abstract 88

THREE-DIMENSIONAL ANALYSIS OF RETINAL VASCULATURE USING OPTICAL COHERENCE TOMOGRAPHY ANGIOGRAPHY (OCT-A) AND DEEP LEARNING

Poster

Brown E.*, Rajendram R., Walker--Samuel S.

UCL ~ London ~ United Kingdom

Purpose:

Optical coherence tomography angiography (OCT-A) is an imaging modality enabling 3D visualisation of the human retinal vasculature in vivo. Accurate automated extraction of the 3D vasculature could increase understanding of how these systems are affected in diabetic retinopathy. We report a deep-learning approach for semantic segmentation of 3D vasculature.

Methods:

35 OCT-A images were obtained on the Zeiss Plex Elite 9000. 16 images (size 12x12x3mm) were acquired from 10 patients with diabetic retinopathy. 19 OCT-A images of scan sizes 12x12x3mm, 15x9x3mm and 3x3x3mm were acquired from 10 healthy participants not ascertained for disease status. Vessels were semi-automatically segmented using a custom-built Python software which outputted the vasculature in graph format. With these ground truth labels a 3D UNet was trained. Accuracy and dice scores were used as performance metrics and 5-fold cross validation was employed. Metrics of vessel branching angle, length, tortuosity, and volume were evaluated for each scan size.

Results:

Mean branching angle was 104.3 (sd 45.3) for diabetic retinopathy patients and 104.4 (42.3) for healthy controls. Mean vessel length was 64.4 (sd 52.8) for diabetic retinopathy and 71.0 (55.2) for healthy controls which was statistically significantly different by 2 sample t-test ($p<0.001$). Mean tortuosity was 267.4 (285.5) in diabetic retinopathy and 287.5 (314.7) for healthy controls (statistically significant by 2-sample t-test ($p<0.001$). 5-fold cross validation demonstrated validation accuracy between 0.61-0.63 (mean: 0.62, sd: 0.0064).

Conclusions:

This pilot study indicates potential of deep learning-based methods for extraction of 3D vessel structures. Further work is required to validate the performance of this algorithm in retinas of diverging disease status. Differences in vessel metrics and structure could be a promising biomarker for retinal disease for use in clinic.

Abstract 225

DEEP-LEARNING PREDICTION OF GEOGRAPHIC ATROPHY PROGRESSION: A MODEL-FREE, TRANSFORMER-BASED APPROACH TO FUNDUS AUTOFLUORESCENCE IMAGING

Oral

Airaldi M.*[1], Airaldi F.[2], Cozzi M.[1], Corvi F.[1], Staurenghi G.[1], Invernizzi A.[1]

[1]Eye Clinic, Department of Biomedical and Clinical Science Luigi Sacco, Luigi Sacco Hospital, University of Milan, Milan, Italy. ~ Milan ~ Italy, [2]Delft Center for Systems and Control, TU Delft, The Netherlands. ~ Delft ~ Netherlands

Purpose:

To develop a model-free, deep-learning algorithm capable of predicting the pointwise spread of geographic atrophy (GA) on fundus autofluorescence (FAF) images, and to validate its accuracy at different predicted time intervals.

Methods:

Areas of atrophy were semiautomatically labelled on sequential FAF images and exported along with binarized masks identifying the areas of GA. For each visit, registered sequential FAF images were pre-processed, stacked in sequences of different lengths and fed to a deep neural network tasked with estimating the FAF segmentation in the next visit. A convolutional encoder extracted feature maps from the sequence; then, a multi-head self-attention module integrated the feature map from each visit in the sequence into a final attended map, that was ultimately fed to a convolutional decoder that predicts the GA segmentation in the forthcoming visit.

Results:

A total of 464 FAF images from 100 eyes of 88 patients (69% females) were employed. Mean (SD) age at baseline was 77 (12) years. 32 (53%) eyes presented with diffuse hyperautofluorescence at the margins of atrophy, 15 (26%) with focal and 14 (23%) with banded patterns. Mean (SD) follow-up was 3.9 (1.8) years. Mean (SD) overall growth rate was 1.7 (1.0) mm2/year. The Dice coefficient for the prediction of the last GA image in the sequence was 84.1%, while accuracy was 96.1%.

Conclusions:

Our model-free, transformer-based network predicted the enlargement of GA with satisfactory accuracy, without the need for the extraction of specifically engineered or a priori features.

Abstract 226

UTILIZATION OF AUTOMATED DEEP LEARNING APPROACH TOWARDS DETECTION OF OCULAR TOXOPLASMOSIS USING FUNDUS PHOTOGRAPHS

Oral

Hassan M.*[1], Ormaechea M.S.[2], Halim M.S.[1], Uludag G.[1], Schlaen A.[2], Kesim C.[6], Colombero D.[3], Rudzinski M.N.[3], Ozdal P.C.[4], Subramaniam M.[5], Chundi P.[5], Ozdemir H.B.[6], Nguyen Q.D.[1], Hasanreisoglu M.[6]

[1]Byers Eye Institute, Stanford University ~ Palo Alto ~ United States of America, [2]Hospital Universitario Austral ~ Buenos Aires ~ Argentina, [3]Universidad Nacional de Rosario ~ Rosario ~ Argentina, [4]Ulucanlar Eye Training and Research Hospital ~ Ankara ~ Turkey, [5]University of Nebraska Omaha ~ Omaha ~ United States of America, [6]Koc University, School of Medicine ~ Ankara ~ Turkey

Purpose:

To develop a deep learning algorithm without coding for differentiation of Ocular Toxoplasmosis (OT) fundus images from a normal fundus image.

Methods:

A total of 552 OT patient images from Argentina, Turkey, and USA were compared to 130 healthy images extracted from public datasets. A deep learning model using the Auto ML vision platform from Google LLC (Menlo Park, CA) was trained using 441 OT and 103 normal images followed by validation using 54 OT and 12 normal images. The model was then tested using 57 OT and 15 normal images. Area under the precision-recall curve (AUPRC) was plotted and sensitivity, specificity, positive predictive value (PPV), and accuracy (C) were calculated.

Results:

AUPRC was found to be 0.97. The sensitivity, specificity, PPV, and AC of the model were 96.5%, 100%, 100%, and 97%.

Conclusions:

Clinician-derived automated machine learning model developed without coding was able to differentiate OT from normal images. This has the potential to be developed further to aid physicians in the diagnosis of OT.

Abstract 33

CENTRAL SEROUS CHOROIORETINOPATHY IN A CAUCASIAN COHORT: AN OPTICAL COHERENCE TOMOGRAPHY ANGIOGRAPHY STUDY

Oral

Serra R.*[1], Pinna A.[1], Behar--Cohen F.[2], Coscas F.[3]

[1]Department of Biomedical Sciences, University of Sassari, Sassari, Italy ~ Sassari ~ Italy, [2]Assistance Publique-Hôpitaux de Paris, Department of Ophthalmology, Ophtalmopole, Hôpital Cochin, 75014 Paris, France; ~ Paris ~ France, [3]Centre Ophtalmologique de l'Odeon, 113 Bd Saint Germain, 75006 Paris, France ~ Paris ~ France

Purpose:

To report the incidence of neovascular lesions in central serous chorioretinopathy (CSCR) as well as to assess the quantitative optical coherence tomography angiography (OCTA) features.

Methods:

102 eyes of 102 Caucasian patients with acute or complex CSCR were enrolled and underwent a complete ophthalmological evaluation, including traditional multimodal imaging evaluation and OCTA. Fractal analysis of OCTA slabs showing neovascular lesions was performed to estimate vascular perfusion density (VPD), fractal dimension (FD), and lacunarity (LAC).

Results:

Forty eyes (39.2%) had acute CSCR, whereas the remaining sixty-two (60.8%) had complex CSCR. CNV was observed in 37 (36.27%) eyes, all of which had the complex form. CNVs were classified as type 1 CNV in 11/37 (29.73%) cases and as polypoidal choroidal vasculopathy (PCV) in the remaining 26/37 (70.27%). Overall, mean VPD, FD, and LAC of CSCR-related CNVs were 0.52+0.20%, 1.44+0.12, and 2.4+01.1, respectively. No significant differences between type 1 CNV and PCV were found.

Conclusions:

Complex CSCR is often complicated by type 1 CNV and PCV. These lesions show similar neovascular architecture and branching complexity, a finding supporting the idea that they might be different stages of the same neovascular process.

Abstract 194

NON-INVASIVE CHARACTERIZATION OF INTRARETINAL MICROVASCULAR ABNORMALITIES WITH WIDEFIELD SWEPT SOURCE OCTA IMAGING

Oral

Santos A.*, Lopes M., Marques I., Santos T., Cunha--Vaz J.

1 - AIBILI - Association for Innovation and Biomedical Research on Light and Image ~ Coimbra ~ Portugal

Purpose:

To explore the use of non-invasive methods such as Wide-Field Swept-Source optical coherence tomography angiography (SS-OCTA) to identify and characterize intra-retinal microvascular abnormalities (IRMA) in severe non proliferative diabetic retinopathy (PDR) or PDR patients.

Methods:

26 eyes from diabetes type 2 individuals were imaged with 7-Fields Color Fundus Photography (CFP) and SS-OCTA Zeiss PlexElite 9000 using Wide-Field Angio 15x9mm protocols. Regions suspicious for IRMA were first identified in CFP and then searched in SS-OCTA co-locations on the Superficial Capillary Plexus (SCP) and Vitreous-Retina Interface (VRI) slabs. When detected, presence of surrounding capillary non-perfusion, overlayed flow, hyperreflective dots in inner retina, protrusion of inner limiting membrane (ILM) and breach of ILM with or without breach of posterior hyaloid (PH) were analyzed. Fluorescein angiography (FA) was used to confirm the presence of new vessels.

Results:

Of the total number of IRMAs identified by SS-OCTA (n=69), 80% (n=55) were located in non-perfused areas with 73% (n=40) showing some degree of flow. 82% (n=56) were confirmed within ILM without breaching PH, while 14% (n=10) seem to cause an ILM protrusion with detectable flow in both SCP and VRI slabs.
Only 4% (n=3) were identified as new vessels on OCTA due to its location above PH and detection in the VRI slab. All these proliferation loci showed leakage on FA.

Conclusions:

Wide-Field SS-OCTA images are a valuable tool to identify IRMA and early stages of vascular neo-proliferation, allowing an improved characterization of these vascular lesions and offering an accurate non-invasive alternative to FA for its detection.

Abstract 192

COMPARISON OF 50° HANDHELD FUNDUS CAMERA VERSUS ULTRA-WIDEFIELD TABLE-TOP FUNDUS CAMERA FOR DIABETIC RETINOPATHY DETECTION AND GRADING

Oral

Frizziero L.*[1], Zennaro L.[1], Lapo C.[1], Torresin T.[1], Midena G.[2], Pilotto E.[1], Midena E.[1]

[1]University Hospital of Padova ~ Padova ~ Italy, [2]IRCCS, Fondazione Bietti, Rome, Italy ~ Rome ~ Italy

Purpose:

To compare the performance of Optomed Aurora® handheld fundus camera with standard 50° visual field to ultra-widefield (UWF) table-top fundus camera in diabetic retinopathy (DR) detection and grading.

Methods:

Patients affected by diabetes mellitus and referred to our diabetic retinopathy clinic were enrolled and underwent fundus photography in mydriasis. All photos were taken using the ultra-widefield table-top fundus camera Zeiss Clarus™ 500 and the Optomed Aurora® handheld fundus camera. The following parameters were analyzed: the gradability of the images, the grade of DR, and diabetic maculopathy (DM), the presence of hypertensive retinopathy (HR) and the presence of other ocular diseases.

Results:

We enrolled 759 eyes of 384 diabetic patients and analyzed 5313 fundus photos. Aurora® obtained a sensitivity of 84.2% and specificity of 95.4% for referable cases. Moreover, Aurora® obtained, compared to UWF, an almost perfect agreement with linear weighting for DR, DM and HR (k=0.877, k=0.854 and k=0.961 respectively). The lowest sensitivity was achieved for proliferative DR (58.7% sensitivity, 100% specificity).

Conclusions:

Optomed Aurora® handheld fundus camera imaging showed a strong agreement compared to UWF in grading DR, considering all DR and DM grades, in mydriasis. However, the use of UWF imaging increases the detection of referable eyes.

Abstract 189

ABNORMAL FLUID ACCUMULATION IN THE DIABETIC RETINA QUANTIFICATION USING OCT-LEAKAGE

Oral

Cunha--Vaz J.*[1], Santos T.[1], Marques I.[1], Santos A.[1], Figueira J.[2], Lobo C.[1]

[1]1 - AIBILI - Association for Innovation and Biomedical Research on Light and Image ~ Coimbra ~ Portugal, [2]2 - Department of Ophthalmology, Centro Hospitalar Universitário de Coimbra (CHUC) ~ Coimbra ~ Portugal

Purpose:

To demonstrate abnormal fluid accumulation in the diabetic retina using OCT-Leakage.

Methods:

Seventy-four eyes from 74 type 2 diabetic patients were followed in a 3-year longitudinal study with 1-year intervals using OCT-Leakage. The OCT-Leakage algorithm is an image analysis algorithm based on the projection of low optical reflectivity (LOR) voxels to a plane perpendicular to the depth direction. LOR voxels are identified by thresholding the reflectivity intensity of OCT structural data by a reference value calculated from a normative database of healthy control subjects. Extracellular fluid distribution of a given area of the retina can be measured by the LOR area ratio. LOR sites are identified for the different retinal layers.

Results:

Center-involved diabetic macular edema (CI-DME) was identified in the first visit in 9% of eyes in ETDRS 10-20, 10% of eyes in ETDRS 35and 15% of eyes in ETDRS 43-47. The yes with CI-DME and subclinical CI-DME showed progressive increase in retinal extracellular fluid during the 3-year period of follow-up. CI-DME with increased retinal extracellular fluid accumulation was shown to be associated with vision loss.

Conclusions:

The prevalence of subclinical CI-DME and CI-DME in NPDR occurs independently of the severity of the retinopathy. OCT-Leakage demonstrates a progressive increase in extracellular fluid in long standing CI-DME. Variations in the increase of extracellular fluid are associated with vision loss.

Abstract 188

VESSEL DENSITY METRICS USING SWEPT-SOURCE OCTA DISCRIMINATES SEVERITY STAGING OF NPDR - THE CHART STUDY

Oral

Cunha--Vaz J.*[1], Marques I.P.[2], Parravano M.C.[3], Creuzot--Garcher C.[4], Mastropasqua L.[5], Bandello F.[6]

[1]1- AIBILI - Association for Innovation and Biomedical Research on Light and Image, Coimbra, Portugal; 2-University of Coimbra, Coimbra Institute for Clinical and Biomedical Research (iCBR), Faculty of Medicine, Coimbra, Portugal ~ Coimbra ~ Portugal, [2]AIBILI - Association for Innovation and Biomedical Research on Light and Image ~ Coimbra ~ Portugal, [3]IRCCS-Fondazione Bietti ~ Rome ~ Italy, [4]Department of Ophthalmology, CHU Dijon ~ Dijon ~ France, [5]Excellence Eye Research Centre ~ Chieti-Pescara ~ Italy, [6]Department of Ophthalmology Vita-Salute University, San Raffaele Scientific Institute ~ Milan ~ Italy

Purpose:

To test whether the location of a single or composite set of parameters evaluated with swept-source optical coherence tomography angiography (SS-OCTA) and representing retinal capillary closure, can discriminate non-proliferative diabetic retinopathy (NPDR) staging according to the gold standard ETDRS grading.

Methods:

One-hundred and thirty-four eyes from diabetic patients with different severity stages of NPDR were evaluated using SS-OCTA (PlexElite – Carl Zeiss Meditec) using the 15 x 15mm angiography protocol. Seven-field photographs of the fundus were obtained for ETDRS staging.
Eyes were separated based on their ETDRS severity grade. SS-OCTA perfusion density (PD) and vessel density (VD) metrics were compared for each severity group.

Results:

SS-OCTA metrics of VD and PD in the deep capillary plexus (DCP) obtained with SS-OCTA show statistically significant differences between ETDRS 35 and ETDRS 43-53 severity groups in the perifovea (p-value = 0.002) and in the retina mid-periphery (p-value < 0.001). Differences were also identified in the superficial capillary plexus (SCP) in the retina midperiphery (Extended Ring 3, 12mm < Radius < 15mm) for both VD and PD.

Conclusions:

Information of non-capillary perfusion in the mid-periphery of the retina obtained using wide-field OCTA (PlexElite) is particularly relevant to identify NPDR progression and discriminate between ETDRS 35 (mild NPDR) from ETDRS 43-53 (moderate and severe NPDR).

Comparison between central and midperiphery on SS OCTA

Angiography 15x15mm – ETDRS 35 vs ETDRS 43 - 47

			ETDRS 35 (N = 63)	ETDRS 43-47 (N = 41)	35 vs 43-47
Vessel Density	CSF	SCP	6.8 ± 2.6	6.9 ± 2.9	0.934
		DCP	1.1 ± 1.6	1.0 ± 1.3	0.446
		FR	6.7 ± 2.6	6.9 ± 3.3	0.881
	Inner Ring	SCP	15.0 ± 2.2	14.9 ± 1.9	0.547
		DCP	9.8 ± 2.7	9.1 ± 2.5	0.083
		FR	16.4 ± 2.2	16.5 ± 1.9	0.808
	Outer Ring	SCP	15.9 ± 1.8	15.9 ± 1.5	0.579
		DCP	10.5 ± 2.6	8.9 ± 2.3	**0.002**
		FR	17.1 ± 1.7	17.0 ± 1.4	0.487
	Ext 1	SCP	15.7 ± 1.7	15.6 ± 1.2	0.314
		DCP	9.4 ± 2.5	7.5 ± 2.0	**p < 0.001**
		FR	16.8 ± 1.6	16.5 ± 1.1	0.090
	Ext 2	SCP	13.5 ± 1.5	13.2 ± 1.4	0.212
		DCP	8.3 ± 2.7	6.4 ± 2.0	**p < 0.001**
		FR	14.9 ± 1.6	14.4 ± 1.4	0.062
	Ext 3	SCP	11.3 ± 2.0	10.5 ± 1.8	**0.034**
		DCP	6.7 ± 2.8	4.4 ± 2.0	**p < 0.001**
		FR	12.7 ± 2.2	11.6 ± 1.9	**0.004**

			ETDRS 35 (N = 63)	ETDRS 43-47 (N = 41)	35 vs 43-47
Perfusion Density	CSF	SCP	0.15 ± 0.06	0.15 ± 0.07	0.902
		DCP	0.02 ± 0.04	0.02 ± 0.03	0.411
		FR	0.15 ± 0.06	0.16 ± 0.08	0.868
	Inner Ring	SCP	0.35 ± 0.05	0.35 ± 0.05	0.606
		DCP	0.22 ± 0.06	0.20 ± 0.06	0.097
		FR	0.39 ± 0.05	0.39 ± 0.05	0.928
	Outer Ring	SCP	0.39 ± 0.04	0.39 ± 0.03	0.687
		DCP	0.24 ± 0.06	0.20 ± 0.05	**0.002**
		FR	0.42 ± 0.04	0.42 ± 0.03	0.722
	Ext 1	SCP	0.40 ± 0.04	0.40 ± 0.03	0.588
		DCP	0.22 ± 0.06	0.17 ± 0.05	**p < 0.001**
		FR	0.42 ± 0.04	0.42 ± 0.02	0.251
	Ext 2	SCP	0.35 ± 0.04	0.34 ± 0.03	0.193
		DCP	0.19 ± 0.06	0.15 ± 0.05	**p < 0.001**
		FR	0.38 ± 0.04	0.37 ± 0.03	0.096
	Ext 3	SCP	0.29 ± 0.05	0.27 ± 0.04	**0.045**
		DCP	0.15 ± 0.06	0.10 ± 0.05	**p < 0.001**
		FR	0.32 ± 0.05	0.29 ± 0.04	**0.006**

Abstract 95

OCT ANGIOGRAPHY AS A TOOL FOR THE DIFFERENTIAL DIAGNOSIS OF DIABETIC AND TRANSIENT RETINOPATHY IN PREGNANT WOMEN WITH TYPE 1 DIABETES

Poster

Pomytkina N.*, Sorokin E.

The S. Fyodorov Eye Microsurgery Federal State Institution, the Khabarovsk Branch ~ Khabarovsk ~ Russian Federation

Purpose:

to determine the OCTA criteria for the differential diagnosis of diabetic and transient retinopathy in pregnant women with diabetes mellitus (DM).

Methods:

11 pregnant women with DM1 were examined, in whom retinopathy was not detected during the pregestational period. The mean age was 28.6±4.1 years, duration of DM was 11.1±8.4 years. In each trimester of pregnancy, an ophthalmological examination was performed with OCTA on the OCT-machine RTVue XR Avanti with HD Angio Retina 6.0 mm scanning protocol.
In all pregnant women in the first trimester, “cotton-like foci” and retinal hemorrhages were determined in the fundus in both eyes. OCTA revealed areas of nonperfusion in the retinal plexuses in 7 women, they were not detected in 4 women.

Results:

When observed in the II and III trimesters, 4 pregnant women without non-perfusion zones showed decrease in the number of “cotton-like foci” and hemorrhages against the background of improved glycemia. During gestation, zones of nonperfusion did not appear in them. The diagnosis was made: transient retinopathy. Three months after delivery, these 4 patients showed regression of retinal changes.
In 7 patients with zones of nonperfusion during pregnancy, appearance of intraretinal microvascular anomalies zones and retinal neovascularization was noted. OCTA revealed progressive expansion of retinal nonperfusion zones. They were diagnosed with diabetic retinopathy and underwent panretinal laser photocoagulation of the retina.

Conclusions:

If symptoms of retinopathy in combination with zones of nonperfusion in the retinal plexuses are detected in a pregnant woman with DM according to OCTA, true diabetic retinopathy is diagnosed, in the absence of zones of nonperfusion - transient retinopathy.

Abstract 193

CHARACTERIZATION OF TWO-YEAR PROGRESSION OF DIFFERENT PHENOTYPES OF NONPROLIFERATIVE DIABETIC RETINOPATHY

Oral

Santos A.*[1], Marques I.[1], Santos T.[1], Carvalho S.[1], Mendes L.[1], Lobo C.[2], Ribeiro L.[2], Cunha--Vaz J.[1]

[1]1 - AIBILI - Association for Innovation and Biomedical Research on Light and Image, ~ Coimbra ~ Portugal, [2]2 - Department of Ophthalmology, Centro Hospitalar e Universitário de Coimbra (CHUC) ~ Coimbra ~ Portugal

Purpose:

To characterize the two-year progression of different risk phenotypes of nonproliferative diabetic retinopathy (NPDR) in type 2 diabetes (T2D).

Methods:

A prospective longitudinal cohort study (CORDIS, NCT03696810) was conducted with 4 visits (baseline, 6-months, one-year and two-years). Ophthalmological examinations included best corrected visual acuity, color fundus photography (CFP) and optical coherence tomography (OCT and OCTA). Risk phenotype classification was performed based on decreased vessel density (VD) ≥ 2 SD in the retinal superficial capillary layer (SCP) -Phenotype C; and increased central retinal thickness (CRT) without decreased vessel density - Phenotype B. ETDRS grading was performed at the baseline and last visits based on 7-fields CFP.

Results:

One hundred and twenty-two eyes from T2D individuals and NPDR fitted in the categories of phenotype B and C and completed the two-years follow-up. Sixty-five eyes (53%) were classified as phenotype B and 57 eyes (47%) as phenotype C. Neurodegeneration represented by thinning of the ganglion cell layer and inner plexiform layer was present in both phenotypes and showed significant progression over the two-year period ($p<0.001$). In phenotype C, significant progression in the two-year period was identified in decreased skeletonized VD ($p=0.01$), whereas in phenotype B microvascular changes showed decreases in PD ($p=0.012$), with preferential involvement of the DCP ($p<0.001$).

Conclusions:

In the two-year period of follow-up both phenotypes B and C showed progression in retinal neurodegeneration, with different changes at the microvascular level between the two phenotypes. Phenotype B progression was characterized by decreases in PD with preferential involvement of the DCP and phenotype C showing decreases in VD.

Abstract 187

RETINOPATHY IN TYPE 1 DIABETES AND OCTA OVERLAY WITH BLOOD GLUCOSE VARIABILITY (RED OCTOBER): A CROSS-SECTIONAL OBSERVATIONAL STUDY IN SUB-OPTIMALLY CONTROLLED PATIENTS

Poster

Donati M.C., Alonzo L.*, Dragotto F., Cifarelli L., Morelli A., Giattini D., Dicembrini I., Vitale V., Giansanti F., Mannucci E., Virgili G.

AOU - Careggi ~ Florence ~ Italy

Purpose:

The contribution of glycemic variability (GV) on diabetes mellitus complications is not yet fully understood. Our primary endpoint is to evaluate the role of GV in suboptimally-controlled patients with type 1 diabetes mellitus (DM1) on macular morphology and vascularization, analyzing optical coherence tomography (OCT) and OCT-angiography (OCTA) parameters.

Methods:

54 adult DM1 patients with interstitial blood glucose monitoring systems and no or mild diabetic retinopathy (DR) underwent a complete ophthalmic examination, OCT and OCT-A. We considered GV indexes, referred to the previous 3 months, duration of disease, glycated hemoglobin and time in hypoglicemia. OCT parameters were central retinal thickness, Ganglion Cell Layer (GCL) and Retinal Nerve Fiber Layer (RNFL) thickness, choroidal thickness; with OCT-A we studied FAZ parameters (area, perimeter and circularity index), vessel and perfusion density (VD and PD) in superficial, deep and choroidal capillary plexi and the number of microaneurysms visible in superficial and deep plexi.

Results:

We didn’t find any statistically significant correlation between GV indexes and OCT and OCT-A parameters. Neither HbA1c, hypoglicemia and age correlated with structural or vascular findings. We found a statistically significant negative correlation between duration of the disease and VD of the choriocapillary plexus (CCP) (divided into central "C", inner “I”, outer “O” and whole “W” areas) . In particular, we found an association by Spearman correlation in VD of CCO (- 0,33, p= 0,015) and in VD of CCW (-0,27, p= 0,048); a strong trend was observed in VD of CCI (-0,24, p= 0,07).

Conclusions:

In a suboptimally-controlled cohort of patients with DM1 and absence of macular edema changes in choriocapillaris plexus can be early observed, and they are more evident the longer is the disease. GV does not seem to influence chorioretinal features, but further studies are needed to find more significant results.

Abstract 103

MULTIMODAL IMAGING FEATURES OF RETINAL NEOVASCULARIZATIONS (NVS) IN PROLIFERATIVE DIABETIC RETINOPATHY (PDR) IN RESPONSE TO 3 ANTI-VEGF INJECTIONS

Oral

Parrulli S.*, Airaldi M., Staurenghi G., Cereda M.G.

Luigi Sacco Hospital ~ Milan ~ Italy

Purpose:

Many studies have classified retinal NVs in PDR considering their imaging features, while other studies have analyzed their response to single intravitreal injections (IVI) of anti-VEGF. We analyzed longitudinal changes of different types of retinal NVs in eyes with PDR in response to three monthly anti-VEGF IVI using multimodal imaging.

Methods:

Prospective, monocentric study conducted at Luigi Sacco Hospital, Milan University. Consecutive patients with PDR and no previous ocular treatments were enrolled. All patients underwent Color Fundus Photography, Fluorescein Angiography, Spectral-Domain Optical Coherence Tomography (SD-OCT) and OCT-Angiography. After 3 monthly IVI of Ranibizumab, the patient was evaluated again using the same imaging modalities. NVs were classified as flat, forward, flat-forward or table-top. The entity of regression was graded as partial or complete. Area, perimeter, vessel density, leakage, vitreous state over the NVs, the presence of pre-retinal hemorrhages and intra-vitreal hyper-reflective dots were evaluated at baseline and in response to therapy.

Results:

A total number of 36 NVs in 8 patients were studied. A partial regression of the NVs was observed in 66.7% of cases and a complete regression in 33.3% of cases after treatment. Table-top NVs demonstrated more frequently a complete regression($p=0.03$). A significative reduction of the NV area, perimeter and VD was observed after treatment($p<0.001$). Flat NVs had more frequently a complete vitreous attachment while table-top showed more often a focal attachment($p<0.05$). A complete regression was more often observed for NVs with a focal vitreous attachment at baseline(10/12), most of NVs with a complete vitreous attachment showed a partial regression(18/24)($p<0.001$).

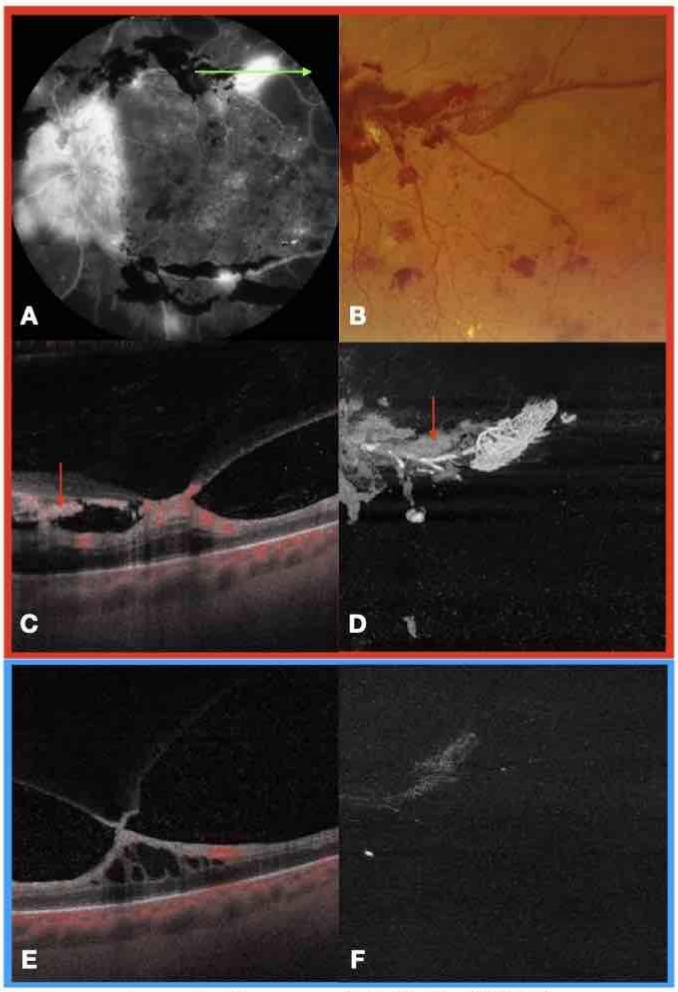
Conclusions:

Flat NVs had more frequently a complete vitreous attachment over the NV and more often showed a partial regression after treatment. On the contrary, table-top NVs had more frequently a focal attachment of the vitreous and demonstrated more often a complete regression of thee NV after therapy.

Table 1. Neovessels characteristics

	Flat	Forward	Flat-Forward	Table-Top	Total	p value
Neovessel n° (%)	15 (42)	4 (11)	9 (25)	8 (22)	36 (100)	
Partial regression n° (%)	11 (73.3)	3 (75)	8 (88.9)	2 (25)	24 (66.7)	**0.03¶**
Complete regression n° (%)	4 (26.7)	1 (25)	1 (11.1)	6 (75)	12 (33.3)	
Area Baseline Median mm² (IQR)	1 (0.4, 2.8)	0.5 (0.3, 1.1)	2.5 (1.9, 3.7)	7.4 (2.1, 8.8)	2 (0.6, 3.9)	**<0.001 ***
Area 3 Months Median mm² (IQR)	0.6 (0.3, 1.8)	0.4 (0.3, 0.7)	2 (1.4, 3.1)	3.2 (1.2, 5.5)	1.4 (0.4, 2.7)	
Area Change Mean mm² (SD)	0.45 (0.50)	0.25 (0.43)	0.68 (0.40)	3.91 (5.01)	1.26 (2.69)	**0.01 #**
Perimeter Baseline mm (IQR)	5.4 (3.3, 11.4)	4.5 (3.3, 6.9)	10.7 (10.3, 17.8)	17.2 (12.3, 21.5)	10.2 (5.2, 14.6)	**<0.001 ***
Perimeter 3 Months mm (IQR)	5.2 (0.3, 9.8)	3.9 (0.3, 5.5)	10.1 (1.4, 13.4)	11.5 (1.2, 15.6)	7.9 (0.4, 11.9)	
Perimeter Change Mean mm² (SD)	1.25 (2.55)	0.97 (0.86)	1.90 (1.22)	4.47 (4.06)	2.10 (2.84)	**0.016 #**
Vessel Density Baseline Mean (SD)	46.8 (17.9)	28.1 (8.7)	32.9 (12.3)	35.8 (10.3)	$	**<0.001 §**
Vessel Density 3 Months Mean (SD)	15 (10.7)	15.4 (4.3)	16.8 (8.9)	8.3 (9.2)	14 (9.6)	
VD Change Mean (SD)	31.81 (24.26)	12.64 (6.62)	16.09 (14.33)	27.54 (8.68)	24.80 (8.98)	0.32 #

¶Fisher's exact test; **Wilcoxon signed rank exact test* referred to the total; * ANOVA analysis referred to all the subgroups; §*Paired t-test* referred to the total



Example of response to 3 IVI of anti-VEGF

Retinal neovessel (NV) detected using fluorescein angiography (A). The same NV is well seen on color fungus photography (B). The corresponding B-scan OCT (C) and OCT-Angiography (D) show a clear flow signal with visualization of the NV architecture. Pre-retinal hemorrhage (red arrow) create a false flow signal and are visualized on enface OCT-A as a grayish halo. After treatment, B-scan and enface OCT-A show any detectable remaining NV (E,F).

Abstract 191

COMBINATION OF ULTRA-WIDE-FIELD COLOUR FUNDUS PHOTOGRAPHY AND OPTICAL COHERENCE TOMOGRAPHY ANGIOGRAPHY DEMONSTRATE DIFFERENT SUBTYPES OF NON-PROLIFERATIVE DIABETIC RETINOPATHY

Oral

Almeida A.*[1], Santos A.[1], Rocha A.[1], Marques I.[1], Figueira J.[2], Santos T.[1], Cunha--Vaz J.[1]

[1]1 - AIBILI - Association for Innovation and Biomedical Research on Light and Image ~ Coimbra ~ Portugal, [2]2 - Department of Ophthalmology, Centro Hospitalar Universitário de Coimbra (CHUC) ~ Coimbra ~ Portugal

Purpose:

To identify changes in central vascular density (VD) using Optical Coherence Tomography Angiography (OCTA) in diabetic patients with and without peripheral lesions identified on ultra-wide-field fundus photography (UWF-FP).

Methods:

A cross-sectional observational study in patients with Diabetes Type I and II. All patients underwent UWF 200º examinations with OPTOS California (Optos, Dunfermline,UK) and central 3x3mm Zeiss Angioplex acquisitions (Cirrus HD-OCT 5000, Zeiss Meditec Inc.). UWF images were graded based on the presence and location of DR lesions: A-eyes without lesions; B-eyes with lesions inside the 7-ETDRS fields area; C-eyes with lesions inside and outside the 7-ETDRS fields area; and D-eyes with peripherical lesions only (outside 7-ETDRS fields area). OCTA metrics such as, vascular density (VD) and perfusion density (PD) were computed with Carl Zeiss Meditec Density Exerciser (version:10.0.12787).

Results:

730 diabetic eyes were considered. 142 (19.5%) presented visible lesions in UWF-FP while 588 (80.5%) showed no visible lesions. From the 142 eyes with visible lesions, 26 (18%) showed only lesions inside the 7-ETDRS fields area, 42 (30%) presented visible lesions inside and outside the 7-ETDRS fields area and 74 (52%) presented visible lesions only in the peripheral retina.
Values of VD and PD on SD-OCTA were significantly decreased in all groups ($p<0.001$). The group with lesions both inside and outside the 7-fields ETDRS area showed the most significant decrease of VD and PD ($p=0.012$ and $P=0.010$, respectively).

Conclusions:

Central retinal VD and PD show changes in macular vessel density in eyes of diabetic individuals without visible lesions or with visible lesions only in the periphery of the retina. These findings suggest the need for OCTA and UWF-FP to characterize different phenotypes and subtypes of DR.

Abstract 70

COMPARISON OF THE EFFECT OF PAN-RETINAL PHOTOCOAGULATION VERSUS INTRAVITREAL ANTI-VASCULAR ENDOTHELIAL GROWTH FACTOR INJECTION ON THE FOVEAL VASCULATURE USING OPTICAL COHERENCE TOMOGRAPHY ANGIOGRAPHY

Oral

Riazi Esfahani H.*, Khalili Pour E., Ahmadi A., Mirghorbani M., Gharehbaghi G., Ghassemi F., Zarei M., Faghihi H., Mirshahi A.

Farabi eye hospital, Tehran university of medical sciences ~ Tehran ~ Iran, Islamic Republic of

Purpose:

To evaluate and compare macular vasculature changes in 1 and 3-months after initiating treatment with either panretinal photocoagulation (PRP) or Intravitreal bevacizumab (IVB) injection.

Methods:

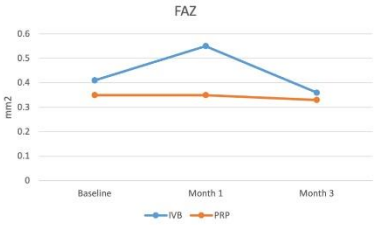
A total of 62 eyes from 33 diabetic patients without macular edema were included in this prospective case series. Of these, thirty-nine eyes (21 patients) were allocated to the PRP group, while 23 eyes (12 patients) were treated with IVB. Optical tomography angiography (OCTA) was performed to measure foveal avascular zone (FAZ) characteristics as well as superficial (SCP) and deep vascular plexus (DCP) densities.

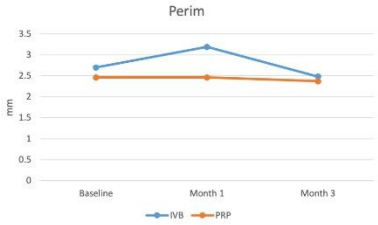
Results:

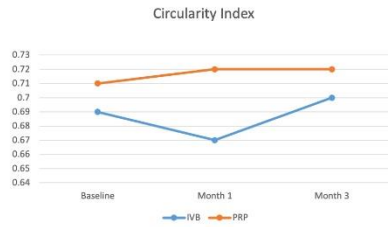
After the initiation of IVB injections, the FAZ area expanded modestly at month 1 but returned to baseline level after three months. In the PRP group, however, FAZ was rather steady. FAZ area changes were significantly different between treatment groups at month 1 ($p=0.02$), but not at month3 ($p=0.31$). The foveal vessel density changes in the SCP were not statistically significant between the two groups, at both month 1 and 3 (all $P>0.05$). A comparison of two treatment arms based on mean DCP density change revealed a significant difference at month 1, but not at month 3 ($p=0.01$ and $p=0.49$).

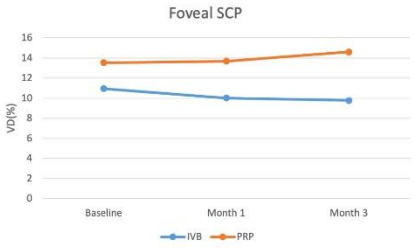
Conclusions:

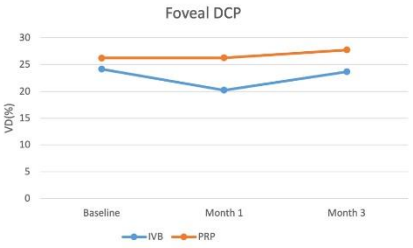
Some vascular metrics changes in OCTA (FAZ area, Perim, Foveal DCP vascular density) may be significantly different between two types of therapies in the very early short-term (1 month) after treatment initiation. In the third month following treatment, all of these differences diminished to insignificance.


FAZ
mm2
0.6
0.5
0.4
0.3
0.2
0.1
0
Baseline
Month 1
Month 3
IVB
PRP


Perim
mm
3.5
3
2.5
2
1.5
1
0.5
0
Baseline
Month 1
Month 3
IVB
PRP


Circularity Index
0.73
0.72
0.71
0.7
0.69
0.68
0.67
0.66
0.65
0.64
Baseline
Month 1
Month 3
IVB
PRP


Foveal SCP
VD(%)
16
14
12
10
8
6
4
2
0
Baseline
Month 1
Month 3
IVB
PRP


Foveal DCP
VD(%)
30
25
20
15
10
5
0
Baseline
Month 1
Month 3
IVB
PRP

Abstract 206

RETINAL MICROVASCULAR AND NEURONAL CHANGES IN ADOLESCENTS WITH TYPE 1 DIABETES

Oral

Pilotto E.*[1], Torresin T.[1], Coppola M.[1], Moretti C.[2], Midena E.[1]

[1]Department of Neuroscience-Ophthalmology, University of Padova, Italy ~ Padova ~ Italy, [2]Pediatric Diabetes Unit, Department of Women's and Children's Health, University of Padova ~ Padova ~ Italy

Purpose:

Type 1 diabetes (T1D) is the most common metabolic disorder of childhood and adolescence. Early identification of retinal changes in young patients may be of clinical value for monitoring diabetic retinopathy (DR) development. The aim of this study was to investigate retinal morphology and vascularization changes in T1D adolescents

Methods:

Adolescents with childhood-onset, long lasting (> 10 years) T1D were consecutively enrolled in this cross-sectional study. A group of healthy age-matched subjects served as healthy controls (HC). Patients and controls underwent optical coherence tomography (OCT) and OCT-angiography (OCTA). The following parameters were considered: retinal thickness and volume for each macular layer, peripapillary retinal nerve fiber layer thickness (pRNFL), and vascular parameters (vessel area density (VAD), vessel length fraction (VLF) and vessel diameter index (VDI)) of macular superficial vascular (SVP), intermediate (ICP), deep (DCP) and radial peripapillary capillary plexuses (RPCP) were quantified.

Results:

Thirty-nine patients (5 with (DR group) and 34 without (noDR group) diabetic retinopathy) and 20 HC were enrolled. The pRNFL and ganglion cell layer (GCL) were thicker in noDR compared to HC and DR, reaching statistically significant values versus HC for some sectors. At the macular level, VAD and VLF were reduced in DR versus HC in all plexuses, and versus noDR in SVP ($p < 0.005$ for all). At the RPCP level, VAD and VDI were increased in noDR versus HC, significantly for VDI ($p = 0.0067$). Glycemic indices correlated to retinal parameters.

Conclusions:

Microvascular and neuronal retinal changes are present in T1D adolescents after long-lasting disease, even in the absence of clinical signs of DR. These changes modify when clinical retinopathy develops. The precocious identification of specific OCT and OCTA changes may be a hallmark of subsequent overt retinopathy.

Abstract 172

SELECTING A DISCRIMINATING THRESHOLD FOR THE SEVERITY OF DIABETIC RETINOPATHY: RELEVANCE OF THE ROC CURVE

Poster

Saidane R.*, Falfoul Y., El Matri K., Ben Zineb F., Hassairi A., El Matri L.

B Department, Hedi Rais Institute of Ophthalmology ~ Tunis ~ Tunisia

Purpose:

To identify the discriminating thresholds of the vascular density index (VDI) and lacunarity measured in OCT-Angiography in relation to the severity of diabetic retinopathy (DR) and to determine their likelihood ratios and predictive values according to a predefined prevalence level.

Methods:

Retrospective case-control study conducted from January to December 2019. Eyes were divided into a group with severe non proliferative or proliferative DR and a control group with absent, minimal or moderate DR. We used the ROC curve from which we determined the most discriminative threshold value of VDI and lacunarity with the best pair {sensitivity (Se), specificity (Sp)} using the Youden index (YI). We calculated the area under the curve (AUC), the likelihood positive (LR+) and negative (LR -) ratios and the positive (PPV) and negative (NPV) predictive values of these tests, using Bayes' theorem (BT) and Fagan's nomogram (FN).

Results:

A total of 56 eyes were included in the study (18 cases;38 controls). The cut-off value for the VDI was 2.41 (YI =0.659). The AUC was 0.852 [p=0.001]. The LR+ and the LR- were 3.636 and 0.121, respectively. The PPV and the NPV were 42% and 0,96% according to BT and 45% and 0,6% using FN. The threshold value for the lacunarity was 0.347 (YI =0.526). The AUC was 0.809 [p=0.014]. The LR+ and the LR – were 2.801 and 0.257, respectively. The PPV and the NPV were 48% and 0.92% according to BT and 49% and 0.25% using FN.

Conclusions:

ROC curves play a significant role in determining the best threshold of the VDI and lacunarity to discriminate between eyes with severe and less severe damage. Thus, in the epidemiological context of diabetes and its potentially retinal impairment, OCT-A could represent a non-invasive biomarker of the severity of DR.

Abstract 72

TREATMENT-NAÏVE DIABETIC MACULAR EDEMA: PRELIMINARY RESULTS FROM THE CLINICAL STUDY “FOVEA”.

Oral

Serra R.[1], Coscas F.*[2], Boulet J.F.[6], Tran T.H.C.[3], Pinna A.[4], Lupidi M.[5]

[1]Department of Surgical and Biomedical Sciences, University of Sassari, Sassari, Italy ~ Sassari ~ Italy, [2]Centre Ophtalmologique de l’Odéon, 113 bd Saint Germain, Paris, France ~ Paris ~ France, [3]Ophthalmology Department, Lille Catholic Hospitals, Lille Catholic University, INSERM U1172, France ~ Lille ~ France, [4]Department of Medical, Surgical, and Experimental Sciences, Ophthalmology Unit, University of Sassari, Sassari, Italy ~ Sassari ~ Italy, [5]Eye Clinic, Department of Experimental and Clinical Medicine, Polytechnic University of Marche, Ancona, Italy ~ Ancona ~ Italy, [6]Paris VI University, 361 rue Clément Ader, Bâtiment C, 27000 EVREUX, France ~ Evreux ~ France

Purpose:

To assess retinal changes in treatment-naïve diabetic macular edema (DME) under Aflibercept therapy for 12 months follow-up.

Methods:

Sixty-six eyes with treatment-naïveDME were included in the FOVEA study and evaluated using both traditional multimodal retinal imaging and optical coherence tomography angiography(OCTA). Best corrected visual acuity (BCVA) was also measured, at baseline and last follow-up. Specifically, the presence of intra- and sub-retinal fluid, and central macular thickness (CMT) were assessed on spectral domain optical coherence tomography (SD-OCT), whereas diabetic retinopathy (DR) features, including microaneurysms, intraretinal microvascular abnormalities and retinal neovascular lesions, were investigated by fluorescein angiography.
Fractal analysis of OCTA slabs of both superficial and deep capillary plexus was carried-out to estimate vascular perfusion density (VPD) and lacunarity (LAC).

Results:

At the last follow-up, BCVA significantly improved in all patients (from 64.77±12.73 to 73.01±10.72 ETDRS letters; p=0.004). There was also a substantial anatomic improvement in terms of intra- and sub-retinal fluid, CMT and DR features, on traditional multimodal imaging. However, no statistically significant differences were found in terms of quantitative OCTA parameters, such as VPD and LAC , between baseline and last follow-up examinations.

Conclusions:

Aflibercept is an effective first-line treatment for DME, allowing for significant anatomical improvements and visual gain, after 12 months of follow-up.

Abstract 197

COLOCALIZATION OF ELLIPSOID ZONE DISRUPTION IN ENFACE OCT WITH CAPILLARY NON-PERFUSION ON DIFFERENT RETINAL VASCULAR LAYERS AND CHORIOCAPILLARIS OF DIABETIC PATIENTS

Oral

Mirshahi R.*[1], Ghasemi Falavarjani K.[1], Ahmadi M.J.[2], Rahdar A.[2], Nekoozadeh S.[1]

[1]Iran University of Medical Sciences ~ Tehran ~ Iran, Islamic Republic of, [2]Chashmyar Company ~ Tehran ~ Iran, Islamic Republic of

Purpose:

To assess the colocalization of ellipsoid zone (EZ) disruption with capillary non perfusion of choriocapillaris (CC), retinal superficial (SCP) and deep capillary plexus (DCP) in diabetic patients using enface OCT and OCTA

Methods:

Macular OCT and OCTA scans (3x3 mm) of 41 diabetic patients were obtained using RTVue XR 100 Avanti instrument. After removing the shadow artifacts, ellipsoid zone integrity was assessed in enface OCT slab using Gaussian mixture model clustering method compared with corresponding EZ enface OCT of 10 age matched normal patients. Similar technique was used for detection of capillary non perfusion in CC enface OCTA. Geometric perfusion density (GPD) maps were also generated for SCP and DCP. Maps of capillary non perfusion in CC, SCP and DCP were compared pixel by pixel with the map generated from EZ disruption.

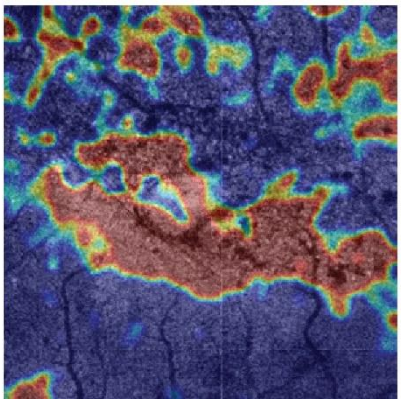
Results:

Twenty-one patients with diabetic macular edema (DME) and 20 patients with diabetic retinopathy without DME were included. In both groups, the overlap of EZ disruption was significantly higher with choriocapillaris non perfusion in comparison to non-perfusion in SCP and DCP (Dry macular group: 33.15% with CC vs. 0.85% with SCP vs. 0.41% with DCP, p value <0.001; DME group: 29.81% with CC vs. 0.55% with SCP vs. 0.45% with DCP, p value <0.001). In linear regression model, there was a statistically significant correlation between logMAR visual acuity and EZ disruption in the dry macular group only (B: 0.473,p value: 0.045).

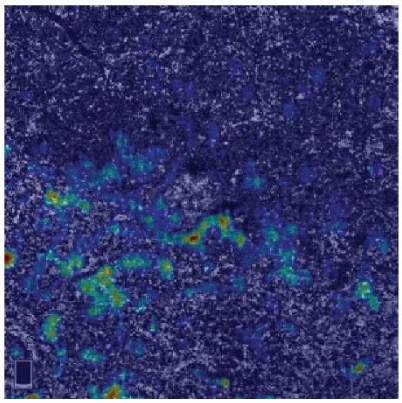
Conclusions:

In patients with diabetic retinopathy, choriocapillaris non-perfusion may have a more significant role in photoreceptor loss than retinal non-perfusion.

EZ disruption heatmap on corresponding enface OCT
(Shadow artifacts were excluded before generating the map)



CC nonperfusion heatmap on corresponding enface OCTA
(Shadow artifacts were excluded before generating the map)



The areas of overlap between EZ disruption and
CC nonperfusion are highlighted in white

Abstract 6

AUTOMATIC MEASUREMENT OF CHOROIDAL THICKNESS WITH SWEPT-SOURCE OPTICAL COHERENCE TOMOGRAPHY IN CHRONIC VOGT-KOYANAGI-HARADA DISEASE: 3 YEARS' FOLLOW-UP

Oral

Yamamoto Rodríguez L.*, García García O., Mediavilla Vallespín R., Anduaga Beramendi L.A.A., Caminal Mitjana J.M.

Hospital of Bellvitge ~ Barcelona ~ Spain

Purpose:

The follow-up of Vogt-Koyanagi-Harada (VKH) disease is traditionally determined qualitatively using indocyanine green angiography (ICGA) and enhanced-depth imaging optical coherence tomography (EDI-OCT). We analysed the value of introducing a quantitative automated measurement by use of swept-source optical coherence tomography (SS-OCT) to measure choroidal thickness in chronic VKH patients.

Methods:

This was a prospective, 3 year longitudinal case-control study at a tertiary hospital. The study included 23 chronic VKH patients (9 convalescent and 14 quiescent) and 17 age-matched controls. SS-OCT was employed to produce automated measurements of choroidal thickness.

Results:

Patients who were receiving treatment for VKH showed choroidal thinning and improved vision while increasing thickness and worsening vision were associated with posterior relapse. Additionally, 41.6% of asymptomatic (no change in visual acuity) recurrences in the convalescent group and 25% of recurrences in the quiescent group were detected by SS-OCT. All recurrences diagnosed with SS-OCT showed signs of inflammation on ICGA.

Conclusions:

SS-OCT is a valuable tool to incorporate in chronic VKH patient follow-up, providing automated measurements of choroidal thickness in a rapid, non-invasive manner to detect posterior segment recurrences even in asymptomatic patients and monitoring treatment response; potentially displacing the need for angiography, a more invasive and time-consuming imaging modality.

Abstract 174

ASSESSMENT OF STRUCTURAL AND VOLUMETRIC CHOROIDAL AND RETINAL INDICES IN EYES WITH VOGT KOYANAGI HARADA DISEASE

Poster

Hassan M.*[1], Ormaechea M.S.[2], Mahajan S.[1], Uludag G.[1], Schlaen A.[2], Nguyen Q.D.[1]

[1]Byers Eye Institute, Stanford University ~ Palo Alto ~ United States of America, [2]Hospital Universitario Austral ~ Buenos Aires ~ Argentina

Purpose:

The ocular disease in Vogt Koyanagi Harada (VKH) is classically divided into four phases (Prodromal, Acute Uveitis, Chronic or Convalescent, and Recurrent). The purpose of this study was To compare retinal and choroidal indices among patients with active (acute and chronic recurrent) and inactive stages of VKH disease.

Methods:

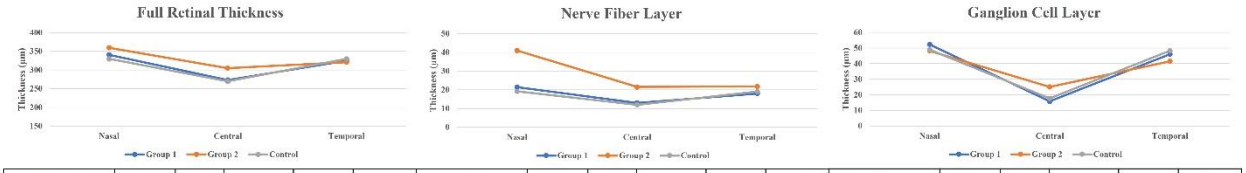
Patients with VKH (2009-2017) were divided into: Group1=Active (acute/chronic recurrent VKH); Group2=Inactive. A third group composed of normal controls was also included in the study. SD-OCT scans were segmented into 1) Full Retina (FR); 2) Retinal Nerve Fiber Layer (RNFL); 3) Ganglion Cell Layer (GCL); 4) Inner Plexiform Layer (IPL); 5) Inner Nuclear Layer (INL); 6) Outer Plexiform Layer (OPL); 7) Outer Nuclear Layer (ONL); 8) Photoreceptor Layer (PRL); 9) Retinal Pigment Epithelium (RPE). Manual segmentation of the choroid was also performed. Mean thickness and volume for segmented layers were compared between two groups and controls.

Results:

Forty-two eyes (22 patients) with VKH disease were enrolled. 32 eyes were in Group 1, 10 eyes in Group 2, and 22 eyes in control group. A comparison of thickness and volume for segmented layers is shown in Figure. An increase in RPE and choroidal indices was noted in Group 1. Whereas, an increase in NFL and INL, and a decrease in PRL, and choroidal indices were noted in Group 2. A sub-analysis was performed where Group 1 was subdivided into acute and chronic recurrent groups. There was no difference between the two groups for both retinal and choroidal indices.

Conclusions:

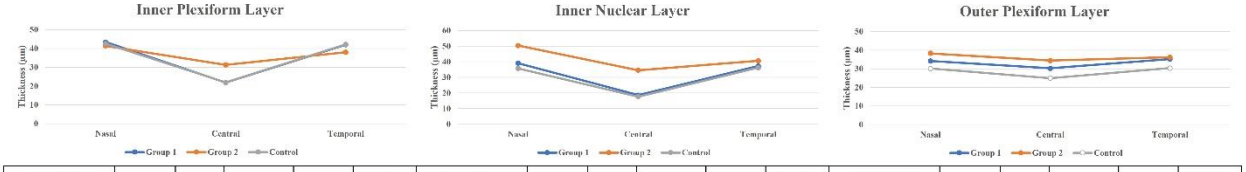
VKH significantly affects retina and choroid. RPE thickening during active VKH points to active inflammatory damage with resultant RPE and PRL thinning in chronic VKH. Choroidal volume and thickness can serve as biomarkers for disease activity in VKH even in chronic recurrent phase where inflammation commonly manifests in anterior segment.



Retinal Layer					P-Value
Full Retinal(FR) Thickness	Group 1	312.89 (21.78)	328.5 (64.50)	Group 2	0.23
			309.71 (17.95)	Control	0.56
			0.20		P-Value
Full Retinal (FR) Volume	Group 1	1.26 (0.09)	1.31 (0.25)	Group 2	0.34
			1.25 (0.07)	Control	0.59
			0.30		

Retinal Layer					P-Value
Retinal Nerve Fiber Layer (RNFL) Thickness	Group 1	17.49 (1.34)	28.10 (14.12)	Group 2	<0.001
			16.73 (2.02)	Control	0.131
			<0.001		P-Value
Retinal Nerve Fiber Layer (RNFL) Volume	Group 1	0.07 (0.01)	0.12 (0.05)	Group 2	<0.001
			0.07 (0.01)	Control	0.121
			<0.001		

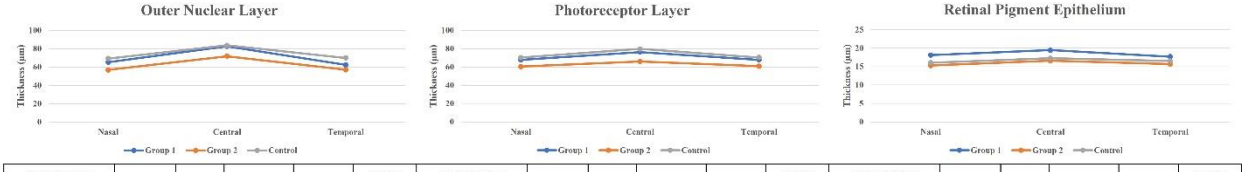
Retinal Layer					P-Value
Ganglion Cell Layer (GCL) Thickness	Group 1	38.06 (4.42)	38.27 (15.92)	Group 2	0.95
			38.27 (3.71)	Control	0.86
			0.99		P-Value
Ganglion Cell Layer (GCL) Thickness	Group 1	38.06 (4.42)	38.27 (15.92)	Group 2	0.73
			38.27 (3.71)	Control	0.88
			0.79		



Retinal Layer					P-Value
Inner Plexiform layer (IPL) Thickness	Group 1	35.77 (2.53)	36.90 (13.39)	Group 2	0.65
			35.58 (2.88)	Control	0.79
			0.66		P-Value
Inner Plexiform layer (IPL) Volume	Group 1	0.15 (0.05)	0.24 (0.06)	Group 2	0.74
			0.15 (0.01)	Control	0.59
			0.90		

Retinal Layer					P-Value
Inner Nuclear Layer (INL)Thickness	Group 1	31.69 (3.25)	41.87 (6.57)	Group 2	<0.001
			29.89 (3.48)	Control	0.06
			<0.001		P-Value
Inner Nuclear Layer (INL) Volume	Group 1	0.14 (0.02)	0.17 (0.03)	Group 2	<0.001
			0.13 (0.02)	Control	0.36
			0.009		

Retinal Layer1					P-Value
Outer Plexiform Layer (OPL) Thickness	Group 1	33.22 (4.06)	36.30 (11.12)	Group 2	0.36
			28.48 (4.82)	Control	<0.001
			0.009		P-Value
Outer Plexiform Layer (OPL) Volume	Group 1	0.13 (0.01) b	0.14 (0.05)	Group 2	0.24
			0.11 (0.02)	Control	0.002
			0.013		

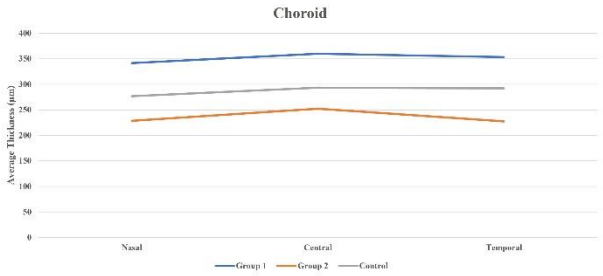


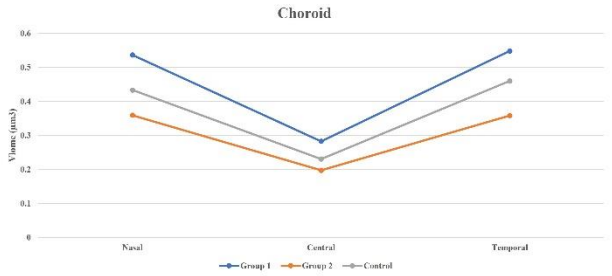
Retinal Layer					P-Value
Outer Nuclear Layer (ONL) Thickness	Group 1	70.16 (16.39)	61.93 (18.99)	Group 2	0.19
			74.33 (12.33)	Control	
			0.034		P-Value
Outer Nuclear Layer (ONL) Volume	Group 1	0.27 (0.07)	0.24 (0.07)	Group 2	0.19
			0.28 (0.05)	Control	0.34
			0.02		

Retinal Layer					P-Value
Photoreceptor Layer (PRL) Thickness	Group 1	70.68 (9.00)	62.5 (14.20)	Group 2	0.036
			73.50 (3.47)	Control	0.12
			0.0016		P-Value
Photoreceptor Layer (PRL) Volume	Group 1	0.28 (0.01)	0.24 (0.06)	Group 2	0.03
			0.28 (0.01)	Control	0.17
			0.0027		

Retinal Layer					P-Value
Retinal Pigment Epithelium (RPE) Thickness	Group 1	18.43 (1.83)	15.87 (1.49)	Group 2	<0.001
			16.62 (1.50)	Control	<0.001
			0.195		P-Value
Retinal Pigment Epithelium (RPE) Volume	Group 1	1.37 (0.27)	0.06 (0.01)	Group 2	0.0013
			0.07 (0.01)	Control	0.0028
			0.27		

Figure 1. Comparison of retinal indices of various retinal layers in VKH patients with active disease (Group1), inactive disease (Group 2), and controls.





Retinal Layer					P-Value
Average Choroidal Thickness	Group 1	351 (68.01)	235.17 (65.53)	Group 2	<0.001
			287.54 (82.19)	Control	0.004
			0.09		

Retinal Layer					P-Value
Average Choroidal Volume	Group 1	1.37 (0.27)	0.92 (0.25)	Group 2	<0.001
			1.13 (0.32)	Control	0.005
			0.19		

	Group 1	Group 2	Control
Central Choroidal Thickness (Mean (SD))	360.07 (70.94) a,b	252.3 (68.98) a	293.67 (86.37) b

a:Significant difference between Group 1 and Group 2; b:Significant difference between Group 1 and Control; c:Significant difference between Group 2 and Control

Figure 2. Comparison of choroidal indices in VKH patients with active disease (Group1), inactive disease (Group 2), and controls.

Abstract 121

OPTICAL COHERENCE TOMOGRAPHY ANGIOGRAPHY MICROVASCULAR ALTERATIONS IN PATIENTS WITH JUVENILE SYSTEMIC LUPUS ERYTHEMATOSUS

Oral

Mapelli C.*, Leone G., Nassisi M., Filocamo G., Minoia F., Mastrangelo A., Serafinelli J., Viola F.

Fondazione IRCCS Ca' Granda Ospedale Maggiore Policlinico ~ Milan ~ Italy

Purpose:

Systemic lupus erythematosus (SLE) has been reported to cause subclinical macular microvascular alterations in adult patients, detected with optical coherence tomography angiography (OCTA). Aim of this study is to check whether vascular alterations are also present in juvenile SLE.

Methods:

Consecutive patients with juvenile SLE were enrolled at the Ca' Granda Foundation Ospedale Maggiore Policlinico, Milan, Italy, in a 1-year period. Both eyes from each patient were scanned with 3x3 mm OCTA acquisitions centered on the fovea. Superficial capillary plexus (SCP) and deep capillary plexus (DCP) angiograms were collected and analyzed using ImageJ software: perfusion density (PD) and vessel density (VD) were calculated after binarization and skeletonization, respectively. The foveal avascular zone (FAZ) was also measured. All data were compared with a group of age-matched healthy subjects using generalized estimating equation.

Results:

24 eyes of 12 patients (9 females; median age: 17,5 years; range: 12-22 years) were analyzed. Patients with jSLE had significantly lower PD (30.13 ± 3.23 %) and VD (10.77 ± 1.48 mm-1) in the SCP compared to age-matched heathy subjects (34.069 ± 2.22 %, $p<0.01$ and 13.7 ± 1 mm-1, $p<0.01$, respectively). Both parameters did not differ for DCP in the two groups. Furthermore, FAZ was the same between jSLE eyes and healthy controls.

Conclusions:

Superficial microvascular changes in LES are present also in the juvenile form of the disease. The significance and the prognostic value of these data need further longitudinal studies with larger cohorts to be confirmed.

Abstract 180

OCT AS A DIAGNOSTIC TOOL IN MULTIFOCAL CHOROIDOPATY

Poster

Cekic S.*[1], Risimic D.[2], Vujanovic M.[3]

[1]Department for Ophthalmology Medical faculty, University of Nis, Serbia ~ Niš ~ Serbia, [2]Departent for Ophthalmology, Medical Faculty University of Belgrade, Serbia ~ Belgrade ~ Serbia, [3]Private Practice Optotim Nis, Serbia ~ Nis ~ Serbia

Purpose:

The aim of this study was to present the results of OCT image in diagnosis ad prognosis in patients with multifocal choroiditis -punctate inner choroidopathy , birdshot chorioretinopathy, acute posterior multifocal placid pigment epitheliopathy, multiple evanescent white dot syndrome, and serpiginous choroiditis and to estimate their diagnostic and prognostic value.

Methods:

Standard ophthalmological examination was performed in patients diagnosed with multifocal choroiditis at the Ophthalmology Clinic, University Clinical Center Niš: visual acuity, slit lamp biomicroscopy, applanation tonometry, indirect ophthalmoscopy, photo documentation and fluorescein angiography (FA), high definition, standard domain, optical coherence tomography (SD OCT Cirrus and RTVue 100) and ultrasonography B scan in indicated cases. The imaging methods, FA and SD OCT were done under the same condition and repeated during the treatment of the disease. Standard laboratory examination, immunological examination, and HLA typing were also performed.

Results:

In the case of PIC, acute lesions appeared as nodular collections under the retinal pigment epithelium and presented as solid inflammatory retinal pigment detachment (PED) on OCT. These solid PED appeared to be ruptured leading to inflammatory infiltration. In patients with AMPPE hyperreflectivity of the outer retinal layers, inflammatory PED with the presence of inflammatory cells was present. The IS/OS disruption and atrophy of RPE can persist. Accumulation of hyperreflective material that rested on RPE, and extended through the interdigital zone, ellipsoid zone, and outer nuclear layer was observed by OCT in patients with MEWDS.

Conclusions:

OCT examination is easy to perform and noninvasive method. However, some limitations of OCT examination are present. Corneal opacification, dense cataracts, significant vitreous haze, or eye hemorrhage are limiting factors for OCT examination.

Abstract 163

CHOROIDAL VASCULARITY INDEX IN CENTRAL AND BRANCH RETINAL VEIN OCCLUSION

Oral

Loiudice P.*[1], Covello G.[1], Figus M.[1], Posarelli C.[1], Sartini M.S.[2], Casini G.[2]

[1]Pisa University ~ Pisa ~ Italy, [2]Pisa University Hospital ~ Pisa ~ Italy

Purpose:

To evaluate choroidal vascularity change in eyes with central and branch retinal vein occlusion (RVO)

Methods:

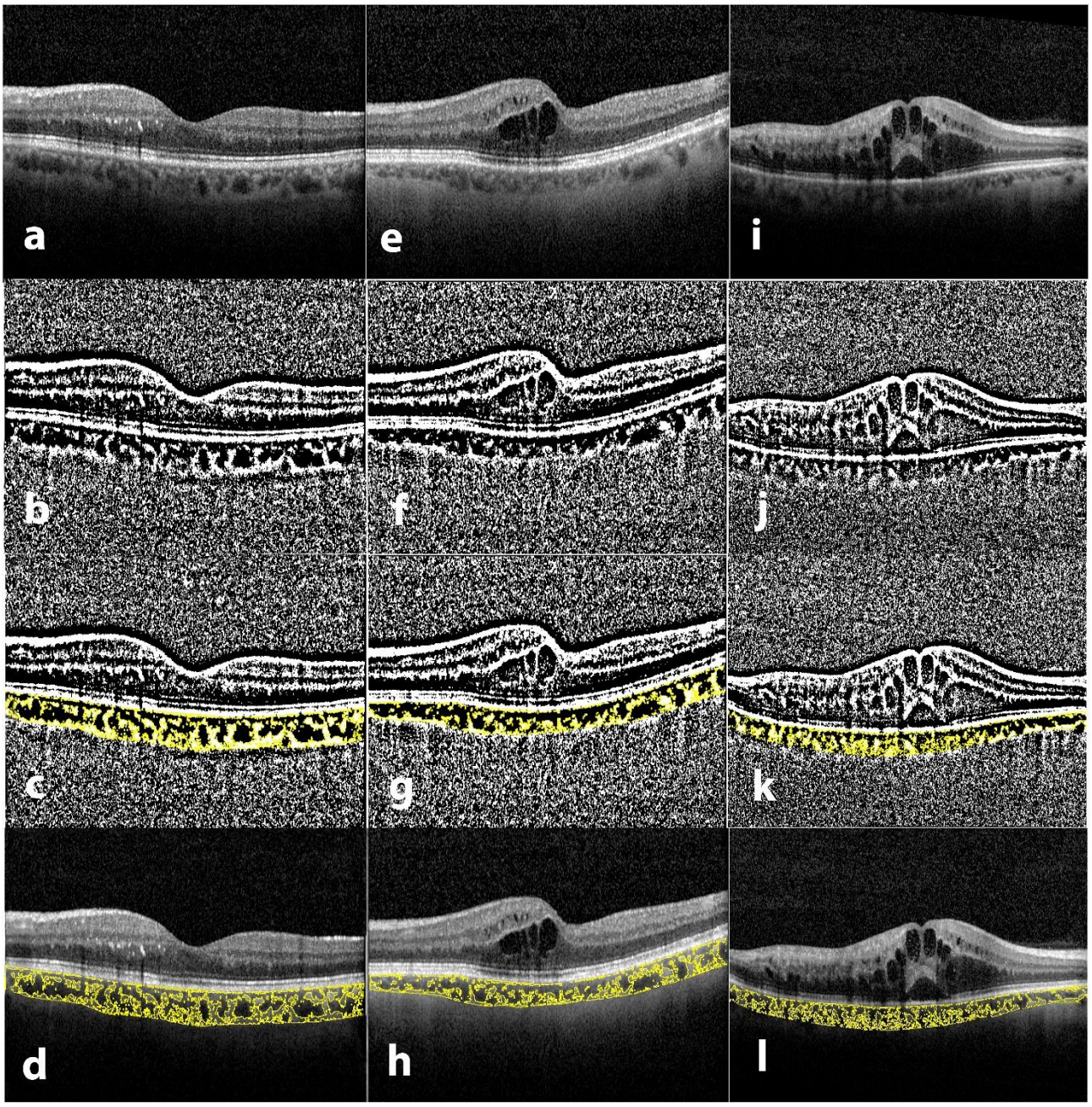
In this retrospective cross-sectional study, we reviewed the records of 47 patients with recent-onset, naïve, unilateral retinal vein occlusion. Enhanced-depth optical coherence tomography scans were binarized using the ImageJ software; luminal area (LA) and total choroidal area (TCA) were measured. The choroidal vascularity index (CVI) was calculated as the proportion of LA to TCA. Depending on the pattern of macular edema, eyes were classified as having no macular edema (nME), cystoid macular edema (CME), cystoid macular edema with serous retinal detachment (mixed).

Results:

CVI, TCA and LA were greater in eyes with RVO than in fellow, unaffected eyes. No difference was found between central and branch RVO except for central macular thickness (CMT). When compared with controls, eyes with CME presented a significant increase in subfoveal choroidal thickness, CMT, TCA, LA and CVI; eyes with mixed macular edema had greater CMT and CVI than contralateral eyes; no significant differences in any of the considered parameters were observed in eyes with nME.

Conclusions:

The results suggest that RVO alters the vascularity of the choroid that varies according to the type of macular edema.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Abstract 1

PUNCTATE INNER CHOROIDOPATHY/IDIOPATHIC MULTIFOCAL CHOROIDITIS-LIKE LESIONS IN UNRELATED RETINAL DISEASES

Oral

Cicinelli M.V.*, Marchese A., Miserocchi E., Battaglia Parodi M., Bandello F.

IRCCS San Raffaele Scientific Institut ~ Milan ~ Italy

Purpose:

To report a cohort of patients with punctate inner choroidopathy/idiopathic multifocal choroiditis (PIC/iMFC)-like lesions and concurrent, unrelated, chorioretinal disorders.

Methods:

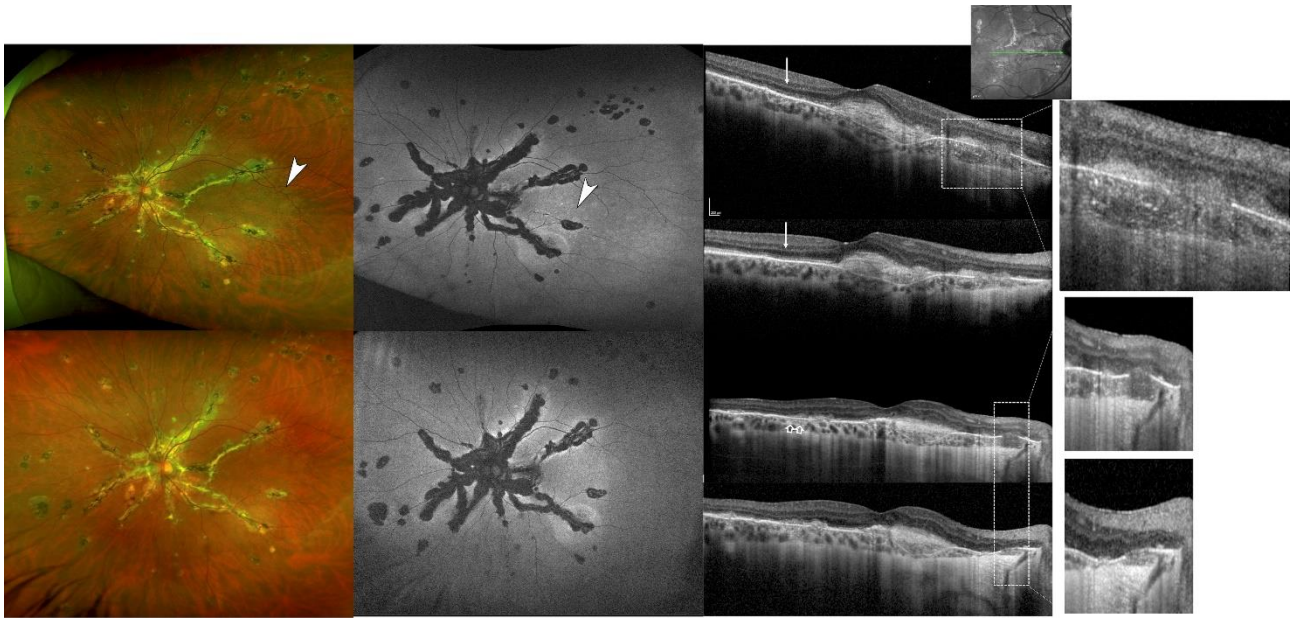
Retrospective observational study of patients seen at two referral centers with lesions resembling PIC/iMFC on multimodal imaging. Active PIC/iMFC-like lesions appeared as focal hyperreflective lesions splitting the retinal pigment epithelium/Bruch membrane (RPE/BrM) complex on optical coherence tomography. Chronic PIC/iMFC-like lesions included subretinal fibrosis, multifocal punched-out chorioretinal atrophy, and curvilinear streaks. Patients' demographics, additional imaging features, and treatment responses were collected and summarized.

Results:

Twenty-two eyes of 16 patients with PIC/iMFC-like lesions were included (75% females; median age 40 years). Underlying diagnoses included hereditary retinal conditions (10 patients, 63%) and acquired etiologies, all characterized by RPE/BrM or outer retinal disruption. Fifteen eyes (68%) had active PIC/iMFC-like lesions; 7 eyes (32%) had chronic PIC/iMFC-like lesions. Active PIC/iMFC-like lesions regressed with time and responded to systemic steroids. Subretinal fibrosis (3 eyes, 20%), macular atrophy (3 eyes, 20%), and concomitant subretinal fibrosis and macular atrophy (5 eyes, 33%) developed on follow-up. Recurrences occurred in 5 eyes (23%).

Conclusions:

RPE/BrM or outer retina disruption may trigger PIC/iMFC-like lesions in susceptible patients, presumably due to loss of immune privilege. The PIC/iMFC-like lesions may influence the clinical progression and the visual prognosis of the primary chorioretinal disease.



Abstract 55

SWEPT SOURCE OCT AND SWEPT SOURCE OCT ANGIOGRAPHY FINDINGS IN A CASE OF CYTOMEGALOVIRUS RETINITIS

Oral

Rym M.*, Safa B.A., Zeineb G., Meriem O., Monia C.

Hospital Habib Thameur ~ Tunis ~ Tunisia

Purpose:

To describe Swept source OCT (SS-OCT) and SS-OCT angiography (SS-OCT A) characteristics in a case of Cytomegalovirus (CMV) retinitis.

Methods:

A single case report documented with multimodal imaging

Results:

A 59-year-old male, with medical history of dermatomyositis treated with immunosuppressive therapy, complains of floaters in the right eye (OD) for 3 months. Visual acuity in OD was 20/20. Slit lamp examination revealed 1+ vitreous haze. Fundoscopy showed nasal vascular sheathing and wedge-shaped area of whitening associated with localized hemorrhage and small dot like lesions. Nasal SS-OCT demonstrated cavernous appearance. Nasal SS-OCT A showed absence of the flow in the superficial retinal plexus. Polymerase chain reaction analysis of the anterior chamber aqueous fluid was positive for CMV DNA. Follow-up was marked by the stabilization in clinical examination and SS-OCT.

Conclusions:

Opportunistic CMV retinitis in non-HIV immune-suppressed patient comes in an indolent form with two patterns of retinal necrosis in SS-OCT: “full-thickness necrosis” and “cavernous necrosis”. As in our case, both patterns can co-exist. SS-OCT A shows the exact limits of the sudden stop of flow in the superficial retinal plexus.

Abstract 12

NEW QUANTITATIVE OCTA METRICS FOR THE ASSESSMENT OF THE GROWTH AND ACTIVITY OF MACULAR NEOVASCULARIZATION SECONDARY TO AGE-RELATED MACULAR DEGENERATION.

Oral

Arrigo A.*, Aragona E., Bianco L., Antropoli A., Berni A., Saladino A., Battaglia Parodi M., Bandello F.

IRCCS San Raffaele Scientific Institute ~ Milan ~ Italy

Purpose:

To perform an optical coherence tomography angiography (OCTA) assessment of macular neovascularization (MNV) secondary to age-related macular degeneration (AMD) to test novel quantitative metrics and to provide new insights regarding the patterns of growth and activity of the neovascular network.

Methods:

We collected data from consecutive patients affected by type 1, type 2 or mixed MNV type secondary to AMD. All the lesions were never treated before the inclusion into the study and underwent anti-VEGF treatments by a loading dose of three-monthly injections followed by a treat-and-extend regimen. All the included patients underwent complete ophthalmologic and multimodal imaging assessments. Quantitative OCTA metrics included MNV vessel tortuosity (VT), MNV reflectivity, and MNV high resolution/high speed OCTA gap. The planned follow-up was at least of 1-year. All the clinical and imaging data were statistically analyzed to unveil significant differences and correlations.

Results:

We included 60 MNV eyes (60 patients). Baseline BCVA was 0.51±0.48 LogMAR, improved to 0.30±0.29 LogMAR at the end of the follow-up. MNV VT cutoff value of 8.40 was able to detect two different MNV subgroups, characterized by different outcome and atrophy onset. MNV reflectivity was a useful metric to predict the growth rate and the direction of the expansion of the MNV network. Furthermore, MNV high resolution/high speed OCTA gap metric was useful to detect neovascular capillaries characterized by different filling patterns. All the three metrics significantly correlated with the activity of the MNV lesions and the visual outcome.

Conclusions:

MNV VT, MNV reflectivity and MNV high resolution/high speed OCTA gap resulted clinically relevant OCTA metrics for a deeper assessment of MNV features and clinical course. These advanced quantitative analyses highlighted the need of novel classification strategies of MNV lesions, to customize anti-VEGF treatments, optimizing the long-term morpho-functional outcome.

Abstract 67

OCTA FINDINGS IN MIGRAINE PATIENTS WITH AND WITHOUT AURA

Oral

Cuffaro G.*, Savastano M.C., Savino G.

Fondazione Policlinico Universitario Agostino Gemelli IRCCS ~ Rome ~ Italy

Purpose:

The aim of this study is to evaluate the microvasculature of the macula and the optic nerve in patients affected by migraine with aura (MA) and without aura (MO) by optical coherence tomography angiography (OCTA), comparing the findings with healthy controls (HC).

Methods:

We collected data from ocular and orthotic examinations, including eye motility, intraocular pressure measurement, best-corrected visual acuity (BCVA) measurement, objective refraction measurement, fundus examination, macular and optic disk OCTA examination. All subjects were imaged with Solix Fullrange OCT. The following OCTA parameters were recorded: macular vessel density (VD), inside disc VD, peripapillary VD, peripapillary thickness, disc whole image VD, fovea choriocapillaris VD, fovea VD, parafovea VD, fovea thickness, parafovea thickness, macular Full Retinal Thickness, measured from ILM to retinal pigment epithelium and foveal avascular zone (FAZ) parameters. Clinical and demographical data about migraine patients were collected by a neurologist.

Results:

We included 56 eyes from 28 patients with a diagnosis of MO, 32 eyes from 16 patients with a diagnosis of MA, and 32 eyes from 16 healthy control subjects. The FAZ area was 0.230 ± 0.099 mm 2 in the MO group, 0.248 ± 0.091 mm 2 in the MA group and 0.184 ± 0.061 mm 2 in the control group. The FAZ area was significantly larger in the MA group than in the HC group (p=0.007). The foveal choriocapillaris VD was significantly lower in MA patients (63.6 ± 2.49%) when compared with MO patients (65.27 ± 3.29%) (p=0.02).

Conclusions:

An initial impairment of retinal microcirculation can be detected in patients with MA. The study of choroid circulation may early reveal microvascular damage in patients with migraine. OCTA is a useful non-invasive screening tool for the detection of microcirculatory disturbance in patients with migraine.

Abstract 207

ANALYSIS OF SUPRA-RPE GRANULAR DEPOSITS IN FULL THICKNESS MACULAR HOLES USING ADAPTIVE OPTICS IMAGING

Oral

Bacherini D.[1], Govetto A.[2], Mercuri S.*[1], Savastano A.[3], Caporossi T.[3], Faraldi F.[4], Rizzo S.[3], Giansanti F.[1]

[1]Department of Neurosciences, Psychology, Drug Research, and Child Health, Eye Clinic, University of Florence, AOU Careggi ~ Florence ~ Italy, [2]Ophthalmology Department, Asst-Settelaghi, University of Insubria ~ Varese ~ Italy, [3]Ophthalmology Unit, "Fondazione Policlinico Universitario A. Gemelli IRCSS" ~ Rome ~ Italy, [4]Torino, Eye clinic, 18152 ASL Torino ~ Turin ~ Italy

Purpose:

To describe morphology of supra-RPE granular deposits found at the base of Full Thickness Macular Hole (FTMH) by means of a multimodal imaging approach including Adaptive Optics

Methods:

Eyes with diagnosis of FTHM underwent multimodal imaging including Optic Coherence Tomography (OCT), 3x3 mm En-Face OCT through OCT-Angiography and Adaptive Optics (AO) Imaging. Supra-RPE granular deposits were isolated with En-Face OCT through segmentation at FTMH base. Acquisitions were binarized and compared to findings at AO to determine topographical correspondence. Mean reflectivity of Supra-RPE granular deposits was measured compared to background at AO. Identification of these findings was assessed in 2 areas: within the projection of minimum MH diameter (inner FTMH base area); between the inner FTMH base area and the outer base of the FTMH (outer FTMH base area)

Results:

26 eyes from 24 patients were recruited in the study, with 18 eyes displaying presence of distinct supra-RPE granular deposits (69%). At AO imaging, supra-RPE granular deposits appeared as dense hyper-reflective structures, distinct from background of RPE, and corresponded topographically to imaging at En-face OCT and OCT B-scan. Supra-RPE granular deposits were distinguishable from RPE dystrophy by discontinuity with RPE band and intense hyper-reflectivity at AO.
Supra-RPE granular deposits were mostly found within the inner MH width (84%) and their presence corresponded to focal defects at the outer retinal layers and a bumpy morphology of FTMH edges.

Conclusions:

Supra-RPE granular deposits are distinct structures that can be identified at multimodal imaging with high accuracy. Most were found within inner FTMH base area and may represent photoreceptors remnants after FTMH formation as they have high reflectivity at AO. These may be linked to poorer visual outcomes after vitreoretinal surgery.

Abstract 54

PERFUSION CHANGES IN OPTIC DISC IN GLAUCOMA PATIENTS – AN OPTIC COHERENCE TOMOGRAPHY-ANGIOGRAPHY STUDY

Oral

Kirkova R.*[1], Tanev I.[2]

[1]IRCCS Humanitas Research Hospital ~ Milan ~ Italy, [2]Eye Clinic "ZRENIETO", Professor Tanev's Team ~ Sofia ~ Bulgaria

Purpose:

The aim of our study is to compare the perfusion of optic disc head of patients with glaucoma and another control group of young, healthy individuals.

Methods:

Our study includes 30 patients, divided into two groups: 15 patients with glaucoma (subdivided additionally according to the stage of glaucomatous process) and 15 healthy individuals, under the age of 35 years with no ophthalmic and systemic pathologies. They went full ophthalmic examination, tonometry, gonioscopy and OCT-angiography. We compared each glaucomatous patient with a healthy person with the same excavation of the optic disc.

Results:

Our study found significant difference in the vessel density of the optic disc of patients with glaucoma and healthy individuals.
Patients with glaucoma in the initial stage have the same vessel density of the optic disc, as the healthy individuals. Patients with advanced glaucoma have 19% less perfusion, compared to healthy controls.

Conclusions:

OCT-A is helpful and objective, non-invasive tool in assessment of the progression of glaucomatous process. It has enormous advantage in assessment of the disease in patients with additional retinal pathology (age-related macular degeneration, myopic degeneration, diabetic retinopathy)

Abstract 92

THE INFLUENCE OF TOPICAL MYDRIATICS ON PERIPAPILLARY AND MACULAR MICROVASCULATURE MEASURED BY OPTICAL COHERENCE TOMOGRAPHY ANGIOGRAPHY IN HEALTHY SUBJECTS AND DIABETIC PATIENTS WITHOUT DIABETIC RETINOPATHY

Oral

Moleiro A.F.*, Ribeiro M., Vilares--Morgado R., Falcão--Reis F., Rocha--Sousa A., Barbosa--Breda J.

São João University Hospital Center ~ Porto ~ Portugal

Purpose:

Mydriasis does not influence the microvasculature of healthy patients, measured by optical coherence tomography angiography (OCT-A). No studies exist on patients with vascular diseases and many require mydriasis for good-quality scans.
We evaluated the influence of topical tropicamide and phenylephrine on OCT-A measured microvasculature of diabetic patients without diabetic retinopathy.

Methods:

A total of 20 healthy volunteers (healthy group) and 20 diabetic patients without diabetic retinopathy (diabetic group) were enrolled.
All patients had an axial length between 20 and 26 mm, intra-ocular pressures below 21 mmHg (iCare Tonometry®) and best corrected visual acuity of at least 20/25.
Patients underwent OCT-A (peripapillary and macular 6x6mm OCT-A scans, Cirrus HD-OCT 5000, Carl Zeiss Meditec®) at baseline, 20 minutes after tropicamide (10mg/mL) instillation on the left eye, and a third time 20 minutes after phenylephrine (100 mg/ml) instillation also on the left eye. The right eye was used as control.

Results:

In the healthy group, peripapillary and macular superficial vessel densities (VD), as well as Foveolar Avascular Zone (FAZ) area and perimeter, were not different after the instillation of tropicamide ($p>0,05$ for all the parameters) and phenylephrine ($p>0,05$ for all the parameters).
Regarding the diabetic group, macular VD increased significantly after the installation of tropicamide (16.4+-2.2 vs 17.3+-1.4 mm-1; $p = 0,042$). The further instillation of phenylephrine did not induce further changes in macular VD, nor in FAZ parameters. Peripapillary vascularity was not affected by mydriasis.
No significant differences were found in the fellow eyes of any of the groups.

Conclusions:

Mydriasis can introduce a bias in OCT-A measurements. Tropicamide significantly increases superficial macular VD in diabetic patients without diabetic retinopathy, while it has no significant influence on healthy controls. Subsequent phenylephrine has no significant impact on VD. Further studies should be done to assess the impact of isolated phenylephrine.

Abstract 154

BILATERAL PAPILLEDEMA ASSOCIATED WITH RETINAL HEMORRHAGIC APPEARANCE AS EARLIEST SIGN OF SPINAL CORD TUMOR

Poster

Giannuzzi F.*, Carlà M.M., Boselli F., Caputo C.G., Fossataro C., Gambini G., Caporossi T., De Vico U., Rizzo S.

università Cattolica del Sacro Cuore ~ Rome ~ Italy

Purpose:

To report a case of a 57-years-old female patient who presented with prominent bilateral proptosis and swollen disks.

Methods:

A 57-year-old obese patient admitted to our ophthalmic department complaining of bilateral sense of eye swelling and mild blurring vision. The anterior segment and pupillary reflex were normal on ophthalmological testing. Likewise, eye movements were preserved and she did not report diplopia in any position of gaze. Dilated fundus examination revealed bilateral hemorrhagic papilledema, pre-retinal hemorrhages in both eyes, dot and blot hemorrhages in the peripheral retina. Visual acuity was 20/20 in bot eyes.

Results:

Routine hematological investigations revealed increased both Von Willebrand factor and ristocetin factor and LAC positivity. The lumbar puncture (LP) showed elevated cerebrospinal fluid (CSF) proteins. Magnetic resonance imaging (MRI) with contrast of brain and spinal cord showed signs of intracranial hypertension and the presence of two lesions in continuity with each other respectively located at T12-L1 and L1-L2. Radiologic features were compatible with the diagnosis of shwannoma. A surgical procedure was conducted and confirmed the diagnosis after anatomical pathology analysis.

Conclusions:

Although rare, bilateral hemorrhagic swollen disks could be an early sign of spinal cord tumors, in particular shwannomas.

Abstract 59

SMALL-SIZED DISCS AND OCT NORMATIVE DATABASES IN CHILDREN

Oral

Gama R.*[1], Costa R.[2], Nom T.[2]

[1]Hospital da Luz, Gama Eye Care ~ Lisbon ~ Portugal, [2]Hospital da Luz ~ Lisbon ~ Portugal

Purpose:

To compare the parameters of the optic nerve head (ONH) and inner retinal layers thickness between children and adults with small-sized discs (SSD) and normal-sized discs (NSD) using optical coherence tomography (OCT).

Methods:

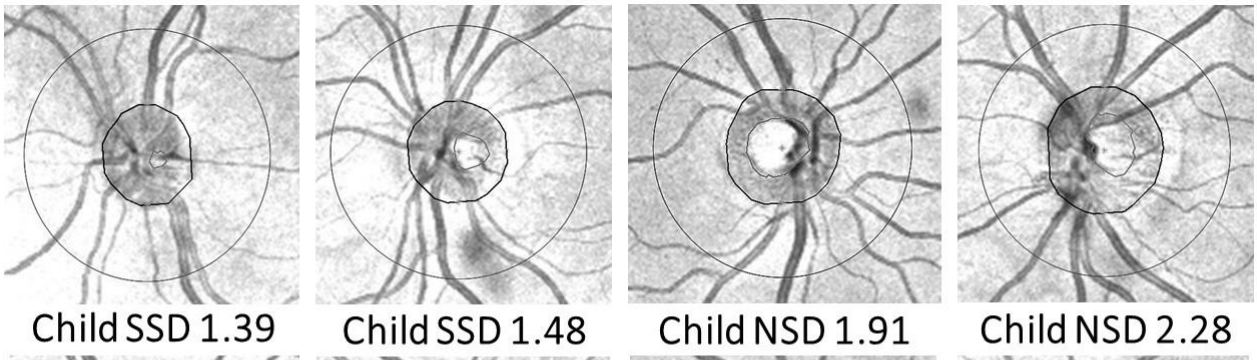
Case-control study that included 172 eyes. Four groups of patients were created: Forty-one children with SSD (disc size between 1.42 and 1.60 mm2), 41 adults with SSD, 45 children with NSD (disc size between 1.80 and 2.20 mm2) and 45 adults with NSD.
All subjects were imaged with spectral domain OCT. Rim area, cup/disc ratio (CDR) and cup volume, peripapillary retinal nerve fiber layer (pRNFL) thickness and ganglion cell-inner plexiform layer (GCIPL) thickness were obtained.

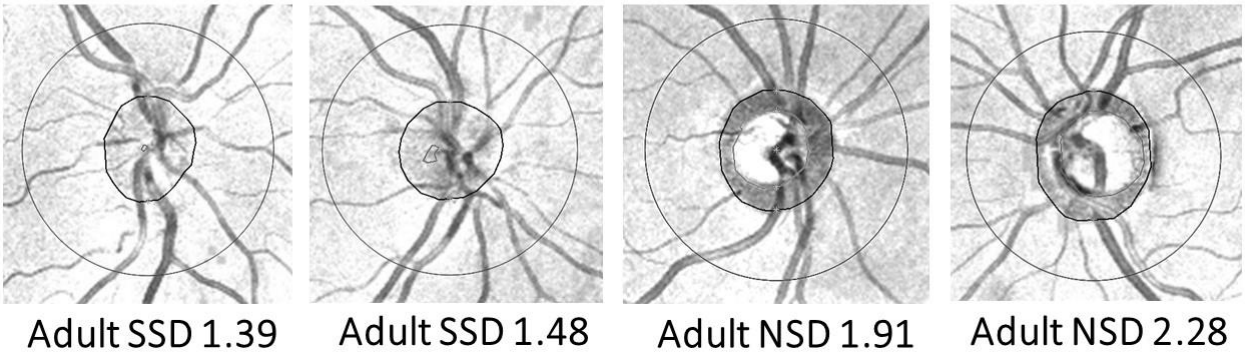
Results:

There were no differences in CDR, cup volume, pRNFL and GCIPL thicknesses between children and adults with SSD, except for the rim area and nasal pRNFL thickness (p=0.009 and 0.010, respectively). There was a statistical difference in all the parameters between children and adults with NSD, except for the GCIPL thickness.

Conclusions:

SSD belonging to children do not have significant differences in ONH parameters and thickness pRNFL and GCIPL thicknesses comparing with adults. According to this study, the normative databases created for the evaluation of the cup volume and CDR in adults can be used in children with SSD.


Child SSD 1.39
Child SSD 1.48
Child NSD 1.91
Child NSD 2.28


Adult SSD 1.39
Adult SSD 1.48
Adult NSD 1.91
Adult NSD 2.28

Abstract 153

STRUCTURAL AND FUNCTIONAL OPHTHALMOLOGICAL FOLLOW-UP OF A PRETERM POPULATION: REPORT AT SIX YEARS OF AGE

Oral

Lepore D., Giannuzzi F.*, Orazi L., Amorelli G., Hu L., Barresi C., Caproli B., Gallini F., Ricci D., Petrianni M., Amore F., Vento G.

Università Cattolica del Sacro Cuore ~ Rome ~ Italy

Purpose:

The aim of the study was to analyse structural and functional ophthalmological outcomes at six years of age in a population of children born with ≤32 weeks of gestational age (GA) and/or ≤1000grams of birth weight (BW) at the A. Gemelli University Hospital in Rome.

Methods:

Per protocol, all preterm babies screened for acute ROP undergo at six year of age a full ophthalmologic examination. Neurodevelopmental aspects were assessed By means of the Wechsler Intelligence Scale for Children (WISC). Recently wide-field fundus retinography and oral ultra widefield fluorescein angiography (OPTOS Inc USA) and OCT and OCT-A (Carl Zeiss, D) imaging were introduced in the protocol. Peripheral retinal vascular features highlighted by UWFFA. Peripheral avascular retina (PAR) was also observed and classified form 1 to 3 based on its extent. Foveal Avascular Zone (FAZ) was observed with both OCT-A and UWFFA and correlated with visual acuity (VA).

Results:

45 preterm infants examined at a mean age of 6 years and 5 months. 72 eyes were previously diagnosed by various ROP stages. ETDRS LogMar visual acuity ranged from 2 to 0. Peripheral retinal vasculature showed at WFFA a dichotomous pattern in 67% (n=55, shunting pattern in 21% (n=17) and finger-like pattern in 12% (n=10). One eye only showed a light leakage at the junction between vascular and avascular retina. PAR was present in 63% (n=29). FAZ was absent on 28,5% (n=24) of the OCTA images with a good accordance with WFFA images. No significant correlation was found with VA.

Conclusions:

Dichotomous branching pattern and PAR are common peripheral vascular features in our population. These findings suggest the importance of a long term follow up in preterm children, especially those with specific peripheral vascular retinal features.

Abstract 140

OPTIC NERVE DRUSEN EVALUATION: A COMPARISON BETWEEN ULTRASOUND AND OCT

Oral

Cione F.*[1], De Bernardo M.[1], Abbinante G.[1], Vecchio G.[1], Capasso L.[2], Rosa N.[1]

[1]University of Salerno ~ Salerno ~ Italy, [2]ASL Napoli 1 ~ Napoli ~ Italy

Purpose:

To compare optic coherence tomography (OCT) and B-scan in the detection of optic disc drusen.

Methods:

In this observational study, eighty-six eyes of 50 patients with optic disc drusen (ODD), 36 bilateral, with a mean age of 34.68 ± 23.81 years, and 54 eyes of 27 patients with papilledema, with a mean age of 35.42 ± 17.47 years, were examined. Patients with ODD, diagnosed with ultrasound, underwent spectral-domain OCT evaluation.

Results:

With US, 28 ODD cases were classified as large (4 buried and 24 superficial), 58 were classified as point-like (6 buried, 49 superficial and 3 mixed). Then, all patients underwent OCT. OCT was able to detect the presence of ODD and/or peripapillary
hyperreflective ovoid mass structure (PHOMS) in 69 eyes ($p<0.001$). In particular, 7 eyes (8.14%) showed the presence of ODD alone, 25 eyes (29.07%) showed only PHOMS, and 37 eyes (43.02%) showed ODD and PHOMS. In 17 eyes (19.77%) no ODD or PHOMS were detected. In the papilledema group, no ODDs were observed with both US and OCT.

Conclusions:

OCT showed the presence of drusen or similar lesions in only 80.23% of the cases highlighted by the US scan, so it does not allow for certain ODD diagnoses, especially in the case of buried ODD.

Abstract 118

CIRCUMSCRIBED CHOROIDAL HEMANGIOMA ASSOCIATED WITH PERIPHERAL CHOROIDAL LESIONS

Oral

Guglielmi A.*, Maggiore G.P., Loiodice S., Iaculli C., Bux A.V.

Policlinico Riuniti di Foggia ~ Foggia ~ Italy

Purpose:

We describe a case of circumscribed choroidal hemangioma (CCH), associated with peripheral choroidal lesions. CCH is well-demarcated reddish-orange solitary lesion, usually located posterior to the equator and typically around the optic nerve head or involved the macula, without any systemic association.

Methods:

A 57 year-old male was referred to our Clinic for decreasing visual acuity in left eye for the past 1 month. The patient refers hypertriglyceridemia, without other systemic diseases, previous right eye inflammation, not documented, treated with oral prednisolone. He underwent complete evaluation including fundus examination, ultrasonography (USG), enhance depth imaging optical coherence tomography (EDI-OCT), optical coherence tomography angiography (OCT-A), fluorescein angiography (FA), indocyanine green angiography (ICGA), that diagnosticate CCH in left eye. The patient was treated with an intravitreal injection of anti-vascular endothelial growth factor (VEGF) and therefore photodynamic therapy (PDT) session. The patient was followed at 3 months.

Results:

All exams confirmed the diagnosis of CCH. Furthermore, FA highlighted peripheral hyperfluorescent lesion and localized vascular hyperfluorescence in temporal quadrant and hyperfluorescent lesion in inferior quadrant in right eye, and peripheral hypofluorescent lesions, surrounded by an hyperfluorescent halo in left eye, hypofluorescence in ICGA in both eyes. The intravitreal injection of Ranibizumab (0.5mg/0.05mL) results in a increase of BCVA, but with a persistent subretinal fluid at the macula. So it was performed PDT over the area of the CCH with a consequent progressive functional and anatomical improvements and also the reduction of CCH thickness.

Conclusions:

To the best of our knowledge, this is the first report on CCH associated with peripheral choroidal lesions. In every case of CCH, it’s important to perform a complete evaluation of both eyes to esclude peripheral lesions.

Abstract 141

CASE REPORT: MULTIMODAL IMAGING IN THE DIAGNOSIS AND FOLLOW-UP OF RETINAL ARTERIAL MACROANEURYSM WITH BRANCH RETINAL ARTERY OCCLUSION

Poster

Ben Jemaa Y.*, Sammouda T., Krifa H., Kharrat M., Zbiba W.

Ophthalmology department, Mohamed Taher Maamouri Hospital, Nabeul ~ Nabeul ~ Tunisia

Purpose:

To describe multimodal imaging findings in retinal arterial macroaneuvrysm (RAM) associated with a branch retinal artery occlusion and to correlate OCTA findings with conventional multimodal imaging.

Methods:

The clinical course, conventional multimodal imaging findings including fundus color photography, swept source optical coherence tomography, fluorescein angiography, and OCTA findings were collected at baseline and during the follow-up of one eye (one patient) with symptomatic RAM.

Results:

A 66-year-old male patient with unremarkable ocular or medical history presented with acute visual decline in his right eye. Best-corrected visual acuity was 3/10. Fundus examination disclosed an elevated yellowish lesion along the superotemporal retinal artery surrounded by flame hemorrhages and exsudates. OCT showed a fusiform intraretinal hyperreflectivity with focal retinal edema. The lesion was hypofluorescent in FA with late leakage and delayed arterial filling. OCT-A showed active blood flow. The patient was diagnosed with hypertension. No treatment was given. At 6-month follow-up, his BCVA raised to 10/10 with no flow on OCTA.

Conclusions:

Retinal Arterial Macroaneurysms are rarely associated with Branch Retinal Artery Occlusion. Multimodal imaging helps in its diagnosis and follow-up. Optical coherence tomography angiography allows the detection of flow signal within RAMs, which may both decrease the need for dye angiography in selected cases and help in treatment decision making.

Abstract 56

SWEPT SOURCE OPTICAL COHERENCE TOMOGRAPHY ANGIOGRAPHY IN VALSALVA-LIKE RETINOPATHY: A CASE REPORT

Poster

Rym M.*, Safa B.A., Slim N., Meriem O., Monia C.

Hospital Habib Thameur Tunis ~ Tunis ~ Tunisia

Purpose:

To describe Swept source optical coherence tomography (SS-OCT) and SS-OCT angiography (SS-OCT A) characteristics in a case of Valsalva-like retinopathy

Methods:

A single case report documented with multimodal imaging

Results:

A 15-year-old female with a history of metastatic follicular lymphoma, presented for a sudden visual loss in her right eye (OD). Fundus examination of OD revealed pre-retinal hemorrhage. SS-OCT showed a sub-internal limiting membrane dome-shaped elevated hyperreflectivity and flow voids in the choriocapillaris with perilesional hypervascularity in the density maps. Patient systemic evaluation revealed the presence of paraneoplastic dermatomyositis with swallowing problems and gastric tube rendering impossible the Valsalva maneuver. Complete blood count revealed severe anemia and thrombocytopenia. The diagnosis of Valsalva-like hemorrhage was made. One-month follow-up was marked by clinical improvement. SS-OCT demonstrated subtotal regression of the initial patterns.

Conclusions:

SS-OCT A can provide useful findings to understand the real physiopathology and monitor the hemorrhage. Larger studies are required to codify the exact vascular retinal and choroidal microstructural modifications during Valsalva-like retinopathy.

Abstract 229

A CASE OF CILIARETINAL ARTERY OCCLUSION: DIAGNOSTIC PROCEDURES

Oral

Rizzo C.*[1], Savastano A.[2], Savastano M.C.[2], Rizzo S.[2], Borin S.[1]

[1]University of Verona ~ Verona ~ Italy, [2]Fondazione Policlinico Universitario A. Gemelli IRCCS ~ Rome ~ Italy

Purpose:

The purpose of this report was to evaluate characteristic findings and functional outcome of Cilioretinal Artery Occlusion (CLRAO), a rare type of retinal vascular occlusion.

Methods:

A 70-year-old woman with history of type 2 diabetes mellitus, controlled hypertension and oligoarthritis presented with sudden vision loss in her left eye. Visual acuity on presentation was 20/32 in her right eye and 20/200 in her left eye, and funduscopic examination revealed an isolated CLRAO in her left eye. Fundus fluorescein angiography, OCT-A and OCT were also performed.

Results:

Our findings led us to the diagnosis of CLRAO in a suspected case of Horton's disease.
Fundus examination of the left eye revealed ischemic retinal whitening in the area supplied by the CLRA.
Optical coherence tomography revealed a hyperreflective, thickened retinal area temporally to the optic disk.
Fundus fluorescein angiography revealed an hyperfluorescent area in the temporal sector of the optic disk with an adjacent hypofluorescent zone.
Finally, on OCT-A we observed a hypoperfused retina corresponding to the zone of CLRA-distribution.
The patient was ultimately sent for a rheumatologist consult and a Color Doppler-Ultrasound of the epiaortic vessels was programmed.

Conclusions:

CLRAO is a rare event (5-7% of retinal artery occlusions) which has been reported in association with various other ocular conditions such as central retinal vein occlusion or anterior ischemic optic neuropathy. Less commonly, CLRAOs may occur as an isolated phenomenon. These cases usually have a better visual prognosis.

Abstract 213

EVALUATION OF SUBCLINICAL POSTERIOR SEGMENT INVOLVEMENT IN MUCOPOLYSACCHARIDOS TYPE II- HUNTER SYNDROME BY SPECTRAL-DOMAIN OPTICAL COHERENCE TOMOGRAPHY

Poster

Kadayifcilar S.*, Karas Y., Bezci Aygun F.

Hacettepe University ~ Ankara ~ Turkey

Purpose:

Mucopolysaccharidosis type II, also known as Hunter Syndrome, results in accumulation of dermatan sulfate and heparan sulfate. Patients with Hunter syndrome typically have clear corneas, but cystoid changes in the macula and clinically pigmentary retinopathy have been reported.

Methods:

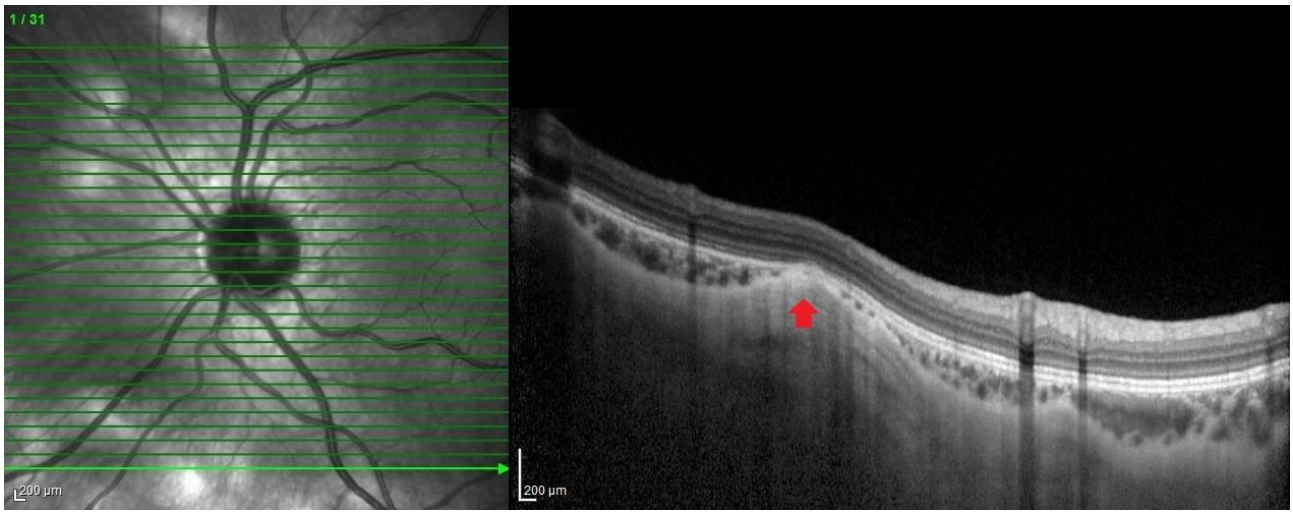
Ocular examination and spectral domain OCT (Heidelberg Spectralis) findings of an asymptomatic 12 year old Hunter case are presented.

Results:

A 12 year old male patient, diagnosed with Hunter syndrome at the age of 5 and followed up with enzyme replacement therapy, had bilateral visual acuity of 0.8 with normal anterior segments. Fundus examination revealed hypopigmented areas nasally. Optical coherence tomography (OCT) showed marked thickening of the external limiting membrane at the macula, when compared to the maculae of same aged children. EDI-OCT showed focal thickening of the sclera with prominent compression of the choroid at the site of nasal hypopigmented area, however the RPE seemed intact.

Conclusions:

In pre-OCT time, hypopigmentation of fundus in Hunter Syndrome was thought to be due to RPE atrophy. In our case, EDI-OCT revealed focal scleral thickening and choroidal compression with no overlying RPE changes. SD-OCT is an important aid in evaluating subclinical ocular changes in the early stages of Hunter syndrome.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Abstract 17

UNIQUE MULTI-MODAL IMAGING FEATURES OF GIANT, SUBFOVEAL CHOROIDAL LIPID GLOBULE

Oral

Weinberger Y.*, Meshi A., Gal--Or O.

Ophthalmology devision, Rabin medical center ~ Petah Tiqva ~ Israel

Purpose:

To report a case of a patient with an asymptomatic, giant, subfoveal, choroidal findings consistent with lipid globule. The case was followed over a year, using multimodal imaging.

Methods:

A case report.

Results:

A 69-year-old asymptomatic female presented with a flat, round, subfoveal lightly orange choroidal structure on routine exam. Optical coherence tomography- enhanced depth imaging revealed a large, hyporeflective cavernous structure, with defined borders, a prominent hyper transmission tail with an intact RPE and retinal layers. Indocyanine green angiography revealed macular hypofluorescent lesion with a dilated choroidal intervortex anastomosis at its lower border and hyperpermeability surrounding the lesion. En face OCT angiography reconstruction at the level of choroid revealed absence of flow signal at the location of the lesion. B-scan ultrasonography demonstrated a flat hypoechogenic structure in the macular location.

Conclusions:

Choroidal lipid globules are a newly recognized OCT signatures that could be misdiagnosed. We present a case of the largest lipid globule ever reported with a review of unique imaging features.

Abstract 210

THE USE OF OCT-A IN THE DETECTION OF PATHOLOGICAL PERIPAPILLARY MICROCIRCULATION AND THE EVALUATION OF ITS TREATMENT.

Oral

Tsigkos D.*[1], Theodorou C.[2], Gkogkou K.[2], Zouzoulas E.[3], Tsigkos V.[2]

[1]Ophthalmiatreion Athinon ~ Athens ~ Greece, [2]Ophthalmological Clinic C'est la Vue ~ Athens ~ Greece, [3]Naval Hospital ~ Athens ~ Greece

Purpose:

To highlight the key contribution of OCT-Angiography (OCT-A) in the early diagnosis and monitoring of pathological microcirculation and to point out the value of enhancing the microcirculation of the optic nerve head, with a combination (cocktail) of vasodilators.

Methods:

Patient 1(P1) 68F
POH: Ischemic optic nerve (OD)
Rx: no stable antiglaucomatic treatment(adv.effects). Acetazolamide ¼ x1 and vasodilating supplements (CoQ10, Bilberry extract / Pinus Pinaster)
Presents with a significantly paler optic disc(OD) and incipient VF defects.
BCVA OU: Logmar 0.1
IOP OD/OS: 18/10 mmHg
RNFL: OD/OS 74/103μm

Significant decrease in peripapillary vascular density OD/OS: 37.3%
Rx': Ginkgo Biloba added + transcleral diode cyclophotocoagulation 180 °.

Patient 2 (P2)78M
Is presented with significant pale optic nerves(OU)
PMH: Sleep apnoea
BCVA: 0,2 logMar(nuclear catarract)
IOP OD/OS: 20/18 mmHg
Peripapillary vascular density OD/OS: 38,7%/40,2%
Rx: e.d. Latanoprost,Brimonidine + p.o Ginkgo Biloba,CoQ10, Bilberry extract / Pinus Pinaster

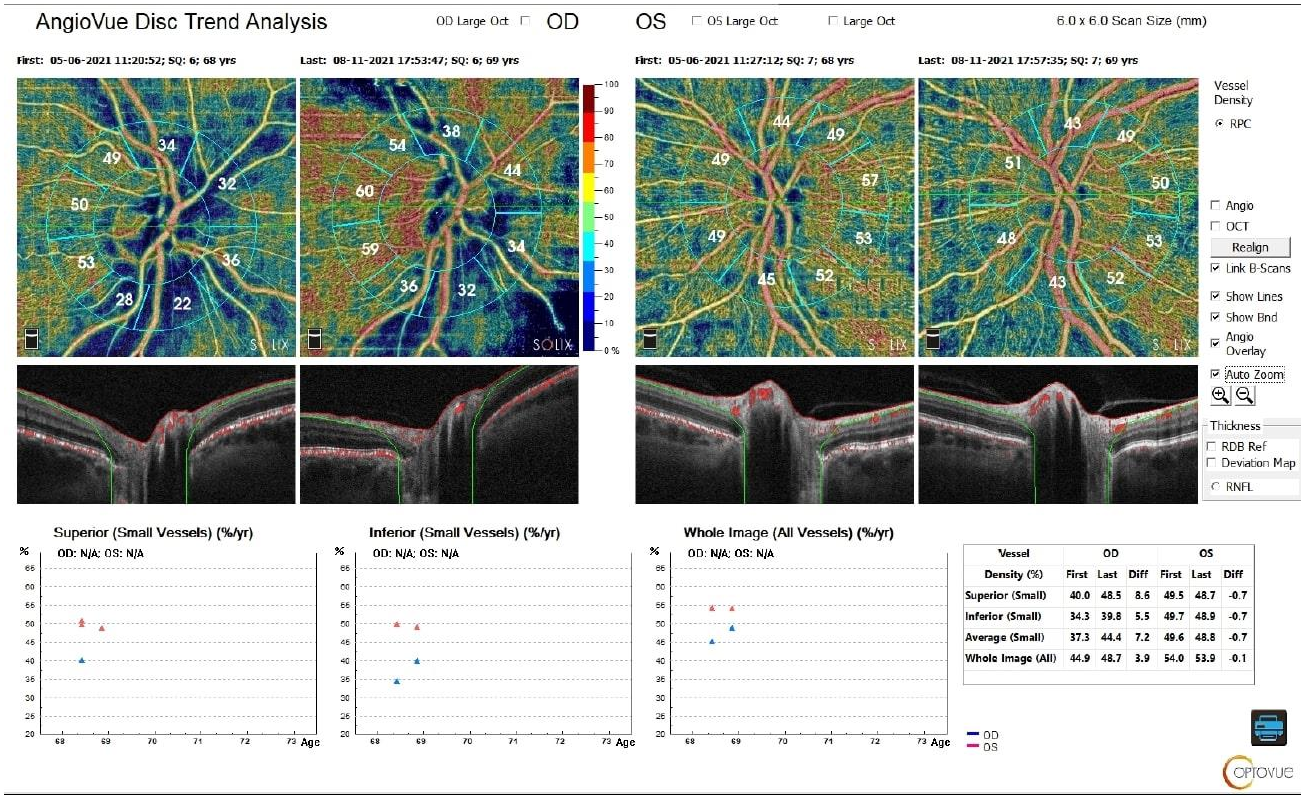
Results:

Both patients have significantly improved peripapillary microcirculation in the affected eye in the follow-up OCT-As.
P1
6 months follow-up(OD):
Controlled IOP:11-14mmHg.
Stable VA,VF
RNFL: Slightly improved: 78-80μm
Peripapillary Vascular Density: OD
OCT-A significant improvement in the peripapillary vascular density:37.3%> 44.4%
P2
IOP OD/OS: 8/10mmHg
Stable BCVA OU

OCT-A significant improvement in the peripapillary vascular density >OD/OS 44,6%/45,7%

Conclusions:

Apart from the detection of patients with poor optic nerve microcirculation, OCT-A can be a highly valuable tool in assessing the possible beneficial effect of controlled IOP and the combination of vasodilating nutraceuticals in the peripapillary microvasculature.



Vessel	OD			OS		
Density (%)	First	Last	Diff	First	Last	Diff
Superior (Small)	40.0	48.5	8.6	49.5	48.7	-0.7
Inferior (Small)	34.3	39.8	5.5	49.7	48.9	-0.7
Average (Small)	37.3	44.4	7.2	49.6	48.8	-0.7
Whole Image (All)	44.9	48.7	3.9	54.0	53.9	-0.1

Abstract 215

OCULAR DECOMPRESSION RETINOPATHY: A RARE COMPLICATION OF GLAUCOMA DRAINAGE SURGERY

Oral

Fahy E.*, Aguilar Munoa S., Barton K.

Moorfields Eye Hospital ~ London ~ United Kingdom

Purpose:

To present two cases of ocular decompression retinopathy which followed glaucoma drainage surgery, with multimodal imaging, and to present a review of the relevant literature.

Methods:

Clinical information was reviewed and information on diagnosis, listing intraocular pressure (IOP), surgical approach and postoperative course compiled. Intraoperative images and video, as well as postoperative widefield retinal imaging and macular optical coherence tomography (OCT) scans were included.

Results:

Case 1 is a 65-year-old male who underwent a right eye trabeculectomy for uncontrolled pseudoexfoliation glaucoma and a preoperative IOP of 45 mmHg. Postoperatively, IOP was 2 mmHg and widespread intraretinal haemorrhages were noted in the right fundus.

Case 2 is a 48-year-old female with a background of scleritis and steroid response glaucoma who underwent a left eye aqueous shunt insertion (Paul Glaucoma Implant). The preoperative IOP was 68 mmHg, and postoperative IOP 11 mmHg. Unilateral intraretinal haemorrhages were noted in the left eye.

In both cases the diagnosis of ocular decompression retinopathy was made.

Conclusions:

Ocular decompression retinopathy is a rare complication of glaucoma drainage surgery, which can occur when high preoperative IOP is rapidly decreased to physiologic or sub-physiologic levels. In both the cases described, the macula was spared and postoperative visual acuity was similar to preoperative levels.

Abstract 40

CLINICAL CASE OF LONG-TERM OBSERVATION OF PARACENTRAL ACUTE MIDDLE MACULOPATHY

Poster

Lutsenko N.*[1], Rudycheva O.[1], Isakova O.[1], Kyrylova T.[1], Yatsun G.[2]

[1]Medical Academy of Postgraduate Education ~ Zaporizhzhia ~ Ukraine, [2]Regional Hospital ~ Zaporizhzhia ~ Ukraine

Purpose:

to describe the possibility of optical coherence tomography (OCT) and OCT-angiography (OCTA) in the diagnosis and long-term monitoring of pathological changes in Paracentral Acute Middle Maculopathy (PAMM).

Methods:

A 37-year-old female patient reported decreased vision and the appearance of dark spot in the left eye, after a hemodialysis session. Her medical history included chronic renal failure. Best-corrected visual acuity was 20/20 in the right eye and 20/32 in the left eye. Funduscopy of the left eye revealed a dark grey lesion along the inferior temporal branch in the parafoveolar region, and normal funduscopy of the right eye. Both OCT and OCT-angiography (Optovue RTVue 100 XR Avanti) have been used to study retinal changes. The patient has been followed up for 4 years.

Results:

Hyperreflective band-like lesion was determined in the middle retina of the left eye (IPL, INL, OPL). OCTA showed a significant decreasing of flow in the deep capillary plexus in the focus area. In a month OCT showed that hyperreflective band was no longer present. OCTA revealed increasing of the blood flow density in these zones. Further observation showed thinning of the INL, IPL and OPL, and after a year, areas with the loss of these layers were formed. OCTA images showed normal blood flow in the SCP and a decreased flow in the DCP in the lesion area.

Conclusions:

The present case outlines the importance of OCT and OCTA in diagnostic of isolated PAMM, monitoring morphological and vascular retinal changes. Long term evaluation showed decreased flow in the DCP in the area of PAMM. There were no new PAMM zones at OCT during the observation.

Abstract 184

HYPERREFLECTIVE RETINAL FOCI IN MULTIPLE SCLEROSIS

Oral

Torresin T.*[1], Pilotto E.[1], Puthenparampil M.[2], Gallo P.[2], Midena E.[1]

[1]Department of Neuroscience-Ophthalmology, University of Padova, Padova, Italy ~ Padua ~ Italy, [2]Multiple Sclerosis Centre, Department of Neuroscience-Neurology, University of Padova, Padova, Italy ~ Padua ~ Italy

Purpose:

Optical coherence tomography (OCT) allows us to identify hyperreflective retinal foci (HRF) which seems to represent clusters of activated microglia. Central nervous tissue microglia is dramatically activated in multiple sclerosis (MS). We aimed to investigate HRF association with cerebrospinal fluid (CSF) cytokines and MRI parameters in relapsing-remitting MS (RRMS).

Methods:

Nineteen patients with RRMS at clinical onset underwent brain 3 Tesla MRI and CSF examination. Cytokines and chemokines in the CSF were analyzed by multiplex technology. OCT analysis, including HRF count, was performed on all patients.

Results:

In RRMS, HRF at the level of the ganglion cell layer (GCL) and the inner nuclear layer (INL) correlated well with soluble markers of microglial origin in CSF and MRI parameters of cortical pathology.

Conclusions:

The association of HRF with intrathecally produced monocyte/microglia-derived cytokines confirms their microglial origin and suggests they are worth of further evaluation. HRF appear to be promising biomarkers for assessing and monitoring in vivo the mechanisms behind microglial activation and proliferation in inflammatory and neurodegenerative brain disorders.

Abstract 35

IMAGING BIOMARKERS OF LEUKEMIC CHOROIDOPATHY

Oral

Menean M.*[1], Apuzzo A.[1], Mastaglio S.[2], Bernardi M.[2], Ciceri F.[2], Modorati G.[1], Miserocchi E.[1], Cicinelli M.V.[1], Bandello F.[1]

[1]Department of Ophthalmology, IRCCS Ospedale San Raffaele ~ Milan ~ Italy, [2]Hematology and Bone Marrow Transplant Unit, IRCCS Ospedale San Raffaele ~ Milan ~ Italy

Purpose:

To investigate the presence of subclinical leukemic choroidopathy in patients with acute leukemia (AL). Primary aim was to compare choroidal metrics between AL patients and healthy controls and longitudinally explore choroidal changes before and after disease remission. Secondary aim was to correlate choroidal metrics in AL patients with systemic parameters.

Methods:

This was a prospective longitudinal study of 26 eyes of 14 AL patients. All patients underwent optical coherence tomography (OCT) and OCT-angiography at baseline. Subfoveal choroidal thickness (SCT), total, luminal and vascular choroidal area (TCA, LCA, VCA), choroidal vascularity index (CVI) and flow deficit (FD) were the choroidal parameters considered in the study. With the hypothesis that choroidal hyperreflective foci (HRF) may represent an indirect sign of choroidal infiltration, we included the assessment of HRF in the analyses. OCT and OCT-angiography were repeated when patients reached AL remission. For each included patient an age- and gender-matched healthy control was imaged.

Results:

The TCA, LCA, SCA and choroidal HRF number were significantly higher in patients than controls (p=0.03; p= 0.04; p= 0.02; p=0.001 respectively). Lower hemoglobin levels were associated with lower SCT values (p=0.008). Higher D-dimer values were associated with lower TCA values (p=0.008), lower LCA (p=0.01) values, higher cFD density (p=0.04) and higher number of choroidal HRF (p=0.03). A higher cFD density was associated with a higher WBC count (p=0.04). The SCT, TCA, SCA, and choroidal HRF number significantly reduced after AL remission (p<0.001, p=0.047, p=0.007, p=0.002 respectively). The CVI increased significantly compared to the active phase (p=0.01). See attached table.
Sei

Conclusions:

The study demonstrates a subclinical choroidal involvement in AL patients, with stromal thickening during AL and normalization after remission. We identified choroidal HRF as biomarker of leukemic choroidopathy, and we hypothesized they could have either an inflammatory or neoplastic nature. Choroidal vascular metrics were correlated with a systemic pro-coagulant state.

Choroidal parameters in patients with acute leukemia and controls.

	Acute leukemia patients (n=26 eyes)	Controls (n=26 eyes)	p-value
Subfoveal CT (µm)	330±82	275±73	0.2
TCA (mm^2)	1.65±0.43	1.38±0.41	0.03*
LCA (mm^2)	1.06±0.27	0.91±0.26	0.04*
SCA (mm^2)	0.59±0.19	0.48±0.17	0.02*
CVI	0.64±0.04	0.66±0.04	0.2
cFD density (%)	27.87±2.77	27.89±3.05	0.9
Choroidal HRF (n)	88±24	67±15	0.001*

Choroidal parameters in patients with active acute leukemia and after clinical remission.

	Active leukemia	Post leukemia remission	p-value
Subfoveal CT (µm)	367±88	303±72	0.001*
TCA (mm^2)	1.86±0.31	1.65±0.35	0.047*
LCA (mm^2)	1.16±0.18	1.08±0.22	0.21
SCA (mm^2)	0.70±0.15	0.58±0.14	0.007*
CVI	0.63±0.03	0.65±0.01	0.01*
cFD density (%)	27.89±3.0	28.68±2.89	0.31
choroidal-HRF (n)	75±23	47±11	0.002*

Abstract 20

HIGH RESOLUTION/HIGH SPEED (HR/HS) GAP: A NOVEL QUANTITATIVE METRIC IN OPTICAL COHERENCE TOMOGRAPHY ANGIOGRAPHY

Oral

Arrigo A., Antropoli A.*, Bianco L., Berni A., Cappuccio G., Saladino A., Bandello F., Battaglia Parodi M.

IRCCS San Raffaele Hospital ~ Milan ~ Italy

Purpose:

Recent advances allow the acquisition of two kinds of OCTA scans: high-resolution (HR) which is slower but with greater detail, and high-speed (HS), faster but with lower resolution. The aim of our study is to assess differences between HR and HS OCTA scans in a healthy cohort of subjects.

Methods:

The following quantitative OCTA parameters were evaluated on HS and HR images: vessel tortuosity (VT), vessel dispersion (VDisp), vessel rarefaction (VR) and choriocapillaris (CC) porosity. Furthermore, we developed a new metric, namely HR/HS overlapping gap, which can quantitatively assess the different amount of blood flow detected by both acquisitions.

Results:

We found HR and HS similar in terms of VD, VDisp and VR values. On the contrary, HR OCTA showed significantly higher VT values and vessel diameter, together with lower CC porosity. HR/HS overlapping gap was at least of 20% for intraretinal capillaries and at least 5% for CC.

Conclusions:

Our data support the reliability of HS OCTA for cases characterized by poor collaboration or fixation issues. We also hypothesize that HR OCTA is able to detect wider range of flow signal with respect to HS OCTA. HR/HS overlapping gap might represent a novel quantitative metric for progression risk stratification.

Abstract 39

OPTICAL COHERENCE TOMOGRAPHY POTENTIAL SOLO ROLE IN THE DIFFERENTIATION BETWEEN MYOPIC MACULAR HEMORRHAGES DUE TO MACULAR NEOVASCULARIZATION OR TO SPONTANEOUS BRUCH'S MEMBRANE RUPTURE

Oral

Battista M.*, Mularoni C., Sacconi R., Crepaldi A., Servillo A., Querques G., Bandello F.

San Raffaele Hospital ~ Milan ~ Italy

Purpose:

To evaluate the sensitivity and specificity of optical coherence tomography (OCT) in discerning between macular hemorrhages due to myopic choroidal neovascularization (m-CNV) and idiopathic macular hemorrhage (IMH) in patients with high myopia (HM), in comparison to the angiographic exams, as OCT-angiography (OCTA).

Methods:

In this retrospective study, 53 eyes from 53 patients affected by macular haemorrhage due to HM were included. All patients underwent OCT and OCTA at the time of macular hemorrhage.

Results:

By means of OCT, 30 out of 53 eyes with macular hemorrhage (56.6%) were diagnosed as type 2 m-CNV, whereas 23 eyes (43.4%) as IMH. OCTA displayed the presence of a neovascular network in 32 cases out of 53 eyes (60.4%), comprising all the CNV cases identified by OCT. OCT demonstrated an optimum profile in terms of sensitivity (94%) and specificity (91%).

Conclusions:

OCT demonstrated a great diagnostic value in differentiating with excellent reliability between the presence of m-CNV in HM patients presenting with a new macular haemorrhage and an IMH. This add relevance to this technique, which could be considered in a committed clinical setting as a solo tool.

Abstract 155

SEAGULL WINGS APPEARANCE ON OPTICAL COHERENCE TOMOGRAPHY: A CASE OF PERIPAPILLARY DETACHMENT IN PATHOLOGIC MYOPIA

Poster

Giannuzzi F.*, Boselli F., Kilian R., Savastano M.C., Savastano A., Rizzo S.

università Cattolica del Sacro Cuore ~ rome ~ Italy

Purpose:

To report the case of a patient who presented with a peripapillary retinal detachment caused by pathological myopia.

Methods:

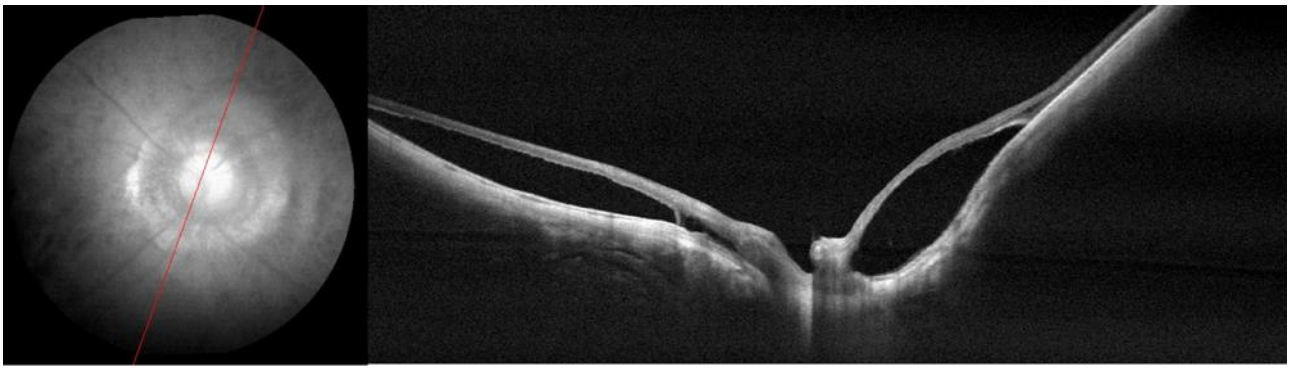
A 73-year-old female with a clinical history of high myopia was admitted to our ophthalmic department complaining of vision loss in her right eye. Best-corrected visual acuity was 20/25 in the right eye and 20/400 in the left eye. The refractive error was -9.00 D in both eyes. Dilated fundus examination revealed myopic retinopathy in both eyes and a yellow peripapillary lesion, distinct from the myopic conus and encircling almost the whole optic disc, in her right eye. The left eye displayed macular atrophy with macular pigmentation due to a previous myopic choroidal neovascularization.

Results:

Optical coherence tomography showed a localized retinal detachment in the peripapillary area, adjacent to the inferior edge of the optic disc, giving a strange “seagull wings” appearance.

Conclusions:

The presence of peripapillary detachment in pathologic myopia (PDPM) should always be excluded in high myopic patients. Further research is due in order to better understand this clinical entity’s pathogenesis and prognosis.



Abstract 96

MYOPIC MACULOPATHY WITHOUT MYOPIA

Poster

Pomytkina N., Bushnina L.*, Sorokin E., Kolenko O.

The S. Fyodorov Eye Microsurgery Federal State Institution, the Khabarovsk Branch ~ Khabarovsk ~ Russian Federation

Purpose:

to analyze the possibilities of using OCT to detect myopic maculopathy in difficult cases of diagnosis. A 25-year-old patient admitted with a diagnosis of central serous choriopathy of the left eye was examined. Vision has been reduced since childhood, and has not been observed to have deteriorated in recent years.

Methods:

Visus OD 20/32corr., OS 20/50corr. Refraction OD sph-0.75D cyl-0.75D ax33□, OS cyl+2.5D ax70□. Ophthalmometry OD 39,36/38,91, OS 39,42/39,01, Axial length OD=26.31mm, OS=25.05mm. Anterior segment of both eyes was not changed, eye's structures were transparent, oblique entry of optic nerve disc was determined in fundus of the right eye, no pathology was detected in macula; optic nerve disc was pale pink in left eye, myopic cone was determined, neuroepithelial detachment was detected in macula , zones of "lattice" dystrophy were determined on periphery of both eyes. OCT-machine: Miranta and RTVue XR Avanti with Macular map and Line 15 mm scanning protocols.

Results:

OCT revealed deep peripapillary myopic staphylomas in both eyes. In the left eye, the macular zone was located on the slope of the staphyloma and had a prominent dome-shaped profile, more pronounced in the vertical direction; detachment of the neuroepithelium and local subfoveal thickening of the choroid were determined. OCTA of the left eye: choroidal neovascularization was not detected. Based on the axial length and OCT data, a diagnosis of dome-shaped macula with detachment of the neuroepithelium of the left eye against the background of latent pathological high-grade myopia was established.

Conclusions:

OCT revealed myopic staphyloma and myopic maculopathy in the eye of a patient with hypermetropic refraction with latent pathological myopia.

Abstract 145

ASSESSMENT OF AN ARTERY-VEIN COMPLEX (AVC) IN MYOPIC CHOROIDAL NEOVASCULARIZATION WITH OCT-A. ROLE IN MYOPIC NEOVASCULARIZATION ACTIVITY.

Oral

Almazán--Alonso E.*, Puertas Ruiz--Falco M., Ruiz--Medrano J., Flores--Moreno I., García--Zamora M., Ruiz--Moreno J.M.

hospital Puerta de Hierro-Majadahonda ~ Madrid ~ Spain

Purpose:

Optical coherence tomography angiography (OCTA) study of dilated choroidal veins (DCV) and perforating scleral vessels (PSV) conforming an artery-vein complex (AVC) and their relationship with myopic choroidal neovascularization and its activity (mCNV) in patients with high myopia.

Methods:

Retrospective analysis of patients with high myopia (≥ -6 D or ≥ 26 mm of axial length) using multimodal imaging. The presence of PSVs, DCVs and mCNV was assessed using structural sweep-source optical coherence tomography (SS-OCT) and AOCT images (TRITON, Topcon Corporation, Japan).

Results:

51 eyes of highly myopic patients with mCNV were studied. 39 of 51(76.5%) showed PSVs under or in contact with the mCNV. 21 out of 51(41.2%) showed an AVC under the mCNV. The mean number of intravitreal injections(IVI) received was 0,06±0.05 along 52,49±53,24(0-161) months of follow-up in the group of patients with AVC. The mean number of relapses was 2,29±2,69 and the mean number of relapses/year was 0,506±0,575. The eyes with ACV need less injections/year ($p<0.05$), showed less relapses/year($p<0.01$) and less relapses during the first year ($p<0.05$). Moreover, they have less choroidal thickness than those without the ACV (p $p<0.05$).

Conclusions:

The patients with artery-vein complex formed by the DCV, the PSV and the myopic neovascular membrane are more prone to relapses than those without it.

Abstract 77

EVALUATION OF RADIATION MACULOPATHY AFTER TREATMENT OF CHOROIDAL MELANOMA WITH RUTHENIUM-106 USING OPTICAL COHERENCE TOMOGRAPHY ANGIOGRAPHY

Oral

Riazi Esfahani H.*, Ghassemi F., Khalili Pour E., Masoomian B., Arjmand M., Zarei M., Faghihi H.

Farabi Eye Hospital, Tehran University of Medical Sciences. ~ Tehran ~ Iran, Islamic Republic of

Purpose:

To assess the impact of brachytherapy on macular microvasculature utilizing optical coherence tomography angiography (OCTA) in treated choroidal melanoma.

Methods:

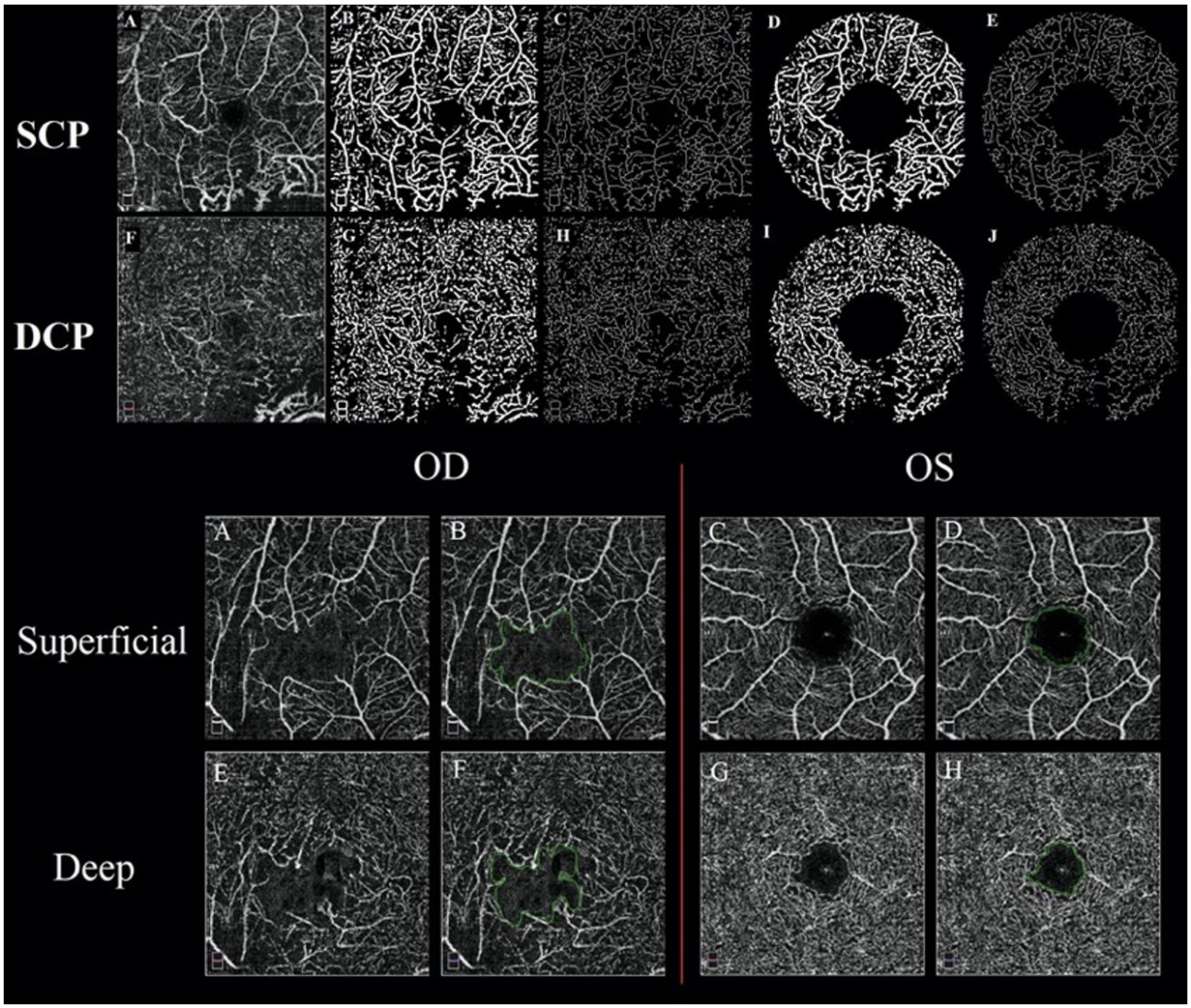
In this retrospective observational case series, we reviewed the recorded data of the patients with unilateral extramacular choroidal melanoma treated with ruthenium − 106 (106Ru) plaque radiotherapy with a followup period of more than 6 months. Automatically measured OCTA retinal parameters were analysed after image
processing. All images were exported to MATLAB software R2019a after noise reduction, vessel area density (VAD) and vessel and skeleton density (VSD) was calculated. The FAZ area extraction algorithm was implemented in python using OpenCV and skimage libraries.

Results:

Thirty-one eyes of 31 patients with the mean age of 51.1 years were recruited. Non-irradiated fellow eyes from the enrolled patients were considered as the control group. Foveal and parafoveal vascular area density (VAD) and vascular skeleton density (VSD) in both superficial and deep capillary plexus (SCP and DCP) were decreased in all irradiated eyes in comparison with non-irradiated fellow eyes ($P < 0.001$). Compared with non-irradiated fellow eyes, irradiated eyes without RM had significantly lower VAD and VSD at foveal and parafoveal DCP (all $P < 0.02$). However, these differences at SCP were not statistically significant.

Conclusions:

The OCTA is a valuable tool for evaluating RM. Initial subclinical microvascular insult after 106Ru brachytherapy is more likely to occur in DCP. The deep FAZ area was identified as a more critical biomarker of BCVA than superficial FAZ in these patients.


SCP
DCP
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Superficial
Deep
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Abstract 227

MULTIMODAL IMAGING OF COMBINED HAMARTOMA OF THE RETINA AND RETINAL PIGMENT EPITHELIUM

Poster

Saidane R.*, El Matri K., Lazreg R., Marzouk G., Falfoul Y., El Matri L.

B Department, Hedi Rais Institute of Ophthalmology ~ Tunis ~ Tunisia

Purpose:

We aim to study multimodal imaging features of combined hamartoma of the retina and retinal pigment epithelium (CHRRPE) through a case report.

Methods:

A patient with CHRRPE who underwent extensive ocular examination including best visual acuity (BVA), fundus autofluorescence (FAF), fluorescein angiography (FFA), Swept Source optical coherence tomography (SS-OCT) and OCT-Angiography (OCT-A).

Results:

A 47-year-old woman consulted for progressive visual blurring in her left eye. Fundus examination revealed an ill-defined polygonal grayish lesion located on the optic nerve, extending to the peripapillary area. FAF displayed hypoautofluorescence at the lesion site. FFA revealed central hypo-fluorescence associated to an early punctate hyper-fluorescence. SS-OCT showed epiretinal membrane (ERM), and disorganization of the neurosensory retina, along with disruption of ellipsoid zone and RPE irregularity. En face OCT-A showed vascular rarefication in the SCP and a high-density filigree pattern of flow signal in the DCP. The patient was diagnosed with CHRRPE, and ERM surgical procedure was indicated.

Conclusions:

Multimodal imaging analyses allowed a fine qualitative and quantitative analyses of CHRRPE features. It may be useful in establishing their diagnosis, aiding management, and informing prognosis.

Abstract 8

PROGRESSION OF PACHYCHOROID NEOVASCULOPATHY INTO ANEURYSMAL TYPE 1 CHOROIDAL NEOVASCULARIZATION OR POLYPOIDAL CHOROIDAL VASCULOPATHY

Oral

Siedlecki J.*, Schworm B., Priglinger S.

University Eye Hospital Munich, LMU ~ Munich ~ Germany

Purpose:

To describe the progression of pachychoroid neovasculopathy (PNV) into pachychoroid aneurysmal type 1 choroidal neovascularization (PAT1) / polypoidal choroidal vasculopathy (PCV).

Methods:

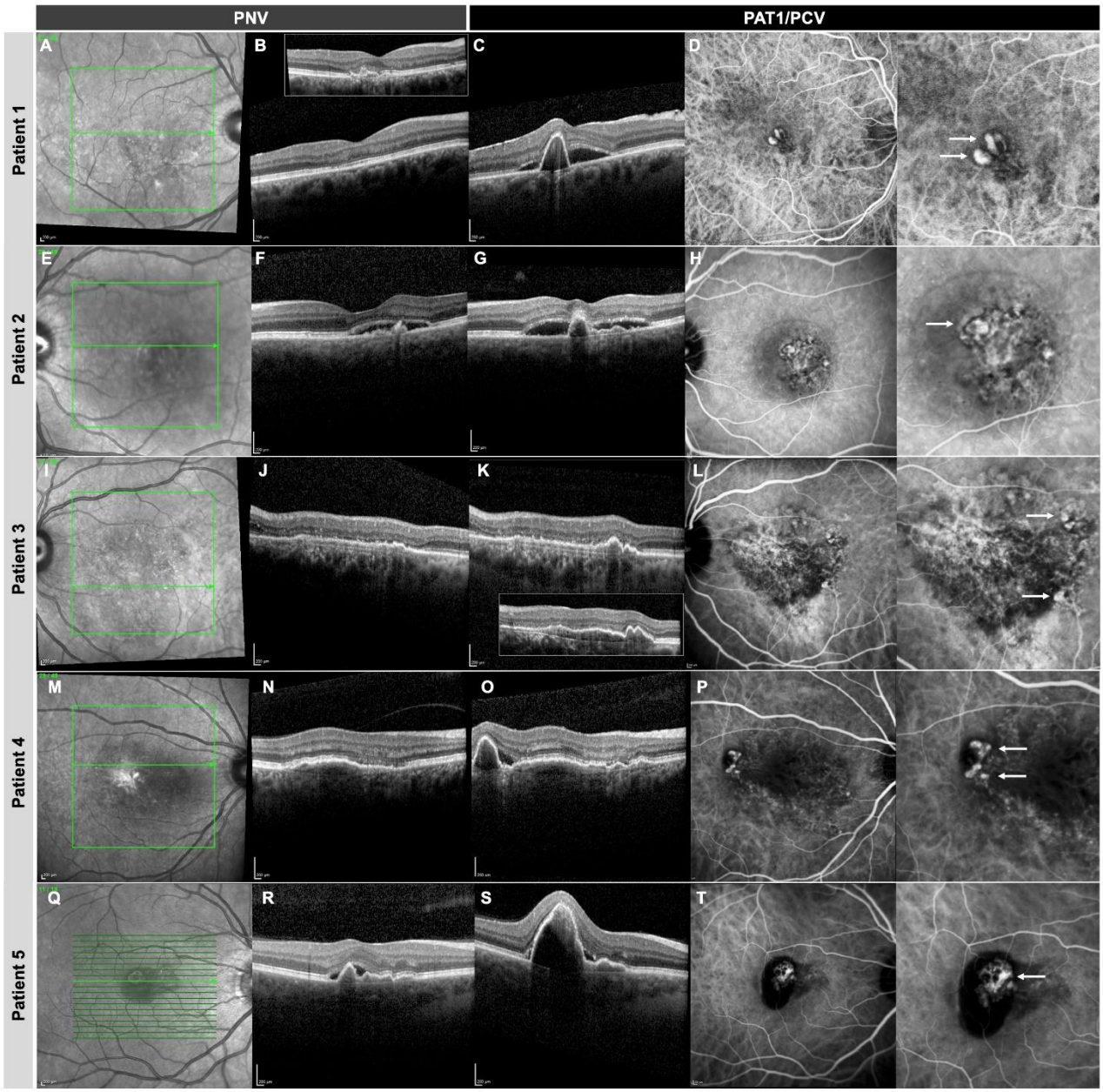
For this retrospective cohort study, the database of the Department of Ophthalmology, Ludwig Maximilians University, Munich, was screened for patients diagnosed with and treated for PNV with a follow-up of ≥ 2 years. Multimodal imaging, including optical coherence tomography and fluorescein and indocyanine green angiography, was reviewed for the presence of choroidal neovascularization (CNV), aneurysms within/at the margins of the CNV and sub-foveal choroidal thickness (SFCT) at first diagnosis and during follow-up.

Results:

In total, 37 PNV eyes of 32 patients with a mean follow-up of 3.3±1.1 (2.0–5.2) years were included in the study. At PNV diagnosis, mean age was 59.7±8.7 (38.5–78.0) years and mean SFCT was 357±92 (185–589) µm. During follow-up, 5 eyes (13.5 %) developed aneurysms after a mean 3.4±0.8 years (2.3–4.2 years) years, defining PAT1/PCV. Risk of PAT1/PCV conversion was 7.4 %, 13.6 % and 30.7 % at years 3, 4 and 5. Lower age at PNV diagnosis (p=0.025) and sustained choroidal thickening (p=0.0025) were identified as risk factors.

Conclusions:

PNV can develop aneurysms within its type 1 CNV, defining conversion to PAT1/PCV. In this study, Kaplan Meier estimates of risk for conversion were 7.4 %, 13.6 % and 30.7 % at years 3, 4 and 5. Younger age at PNV diagnosis and sustained choroidal thickening might represent risk factors.


PNV
PAT1/PCV
Patient 1
Patient 2
Patient 3
Patient 4
Patient 5
A
B
C
D
E
F
G
H
I
J
K
L
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R
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Abstract 105

MULTIMODAL ULTRA WIDE FIELD AND RETRO MODE IMAGING IN A BENIGN CONCENTRIC ANNULAR MACULAR DYSTROPHY

Oral

Romualdi G.*

University of Florence ~ Florence ~ Italy

Purpose:

We present a case of a benign concentric annular macular dystrophy (BCAMD). BCAMD is a progressive autosomal dominant macular dystrophy characterized by parafoveal hypopigmentation and a bull's eye configuration.

Methods:

A 62-year-old woman presented with blurring of vision in the left eye during the last years, with no history of hemeralopia, nyctalopia, photophobia, no significant family history, no current or recent pharmacological therapies. The patient underwent a comprehensive ocular examination, a multimodal ultra wide field and retro mode imaging, FAF and retinography. We also requested the electroretinogram (ERG), a Goldmann visual field and a genetic counseling.

Results:

BCVA in the right eye (OD) was 20/20 and left eye (OS) was 20/25. Fundus examination showed in both eyes a bull's eye maculopathy with foveal sparing followed by hyperplasia of RPE in the temporal sector in OS.Fundus autofluorescence showed foveal hyperautofluorescence followed by annular hypoautofluorescence and hyperautofluorescence. Spectral domain optical coherence tomography (SD-OCT) of both eyes showed foveal thinning, loss of outer nuclear layer, outer plexiform layer,ellipsoid zone in the parafoveal area,saving a small island of ellipsoid at the fovea (flying saucer sign).Multicolor imaging showing concentric annular areas of hypopigmentation and hyperpigmentation around fovea.ERG was normal.Genetic test was negative.

Conclusions:

BCAMD is a rare macular dystrophy,caused by mutation in the interphotoreceptor matrix. In our case,for the first time,retromodal and ultra wide field imaging allows us to describe BCAMD.Their role was of a fundamental importance to demonstrate the central over functioning of the underlying RPE as the parafoveal RPE was atrophic.

Abstract 156

A NOVEL APPROACH TO ESTIMATING CHOROIDAL LESION THICKNESS USING 2D ULTRA-WIDEFIELD OPTOMAP IMAGES

Poster

Yu M.*, Ghoraba H., Mruthyunjaya P.

Stanford University ~ Palo Alto, CA ~ United States of America

Purpose:

Tumor thickness is an established risk factor for transformation of choroidal nevus (CN) into choroidal melanoma (CM) and plays an important role in risk stratification of melanocytic choroidal lesions (MCL). We describe a novel technique for estimating tumor thickness from 2D ultra-widefield (UWF) Optomap images (Optos PLC, Dunfermline, Scotland, UK).

Methods:

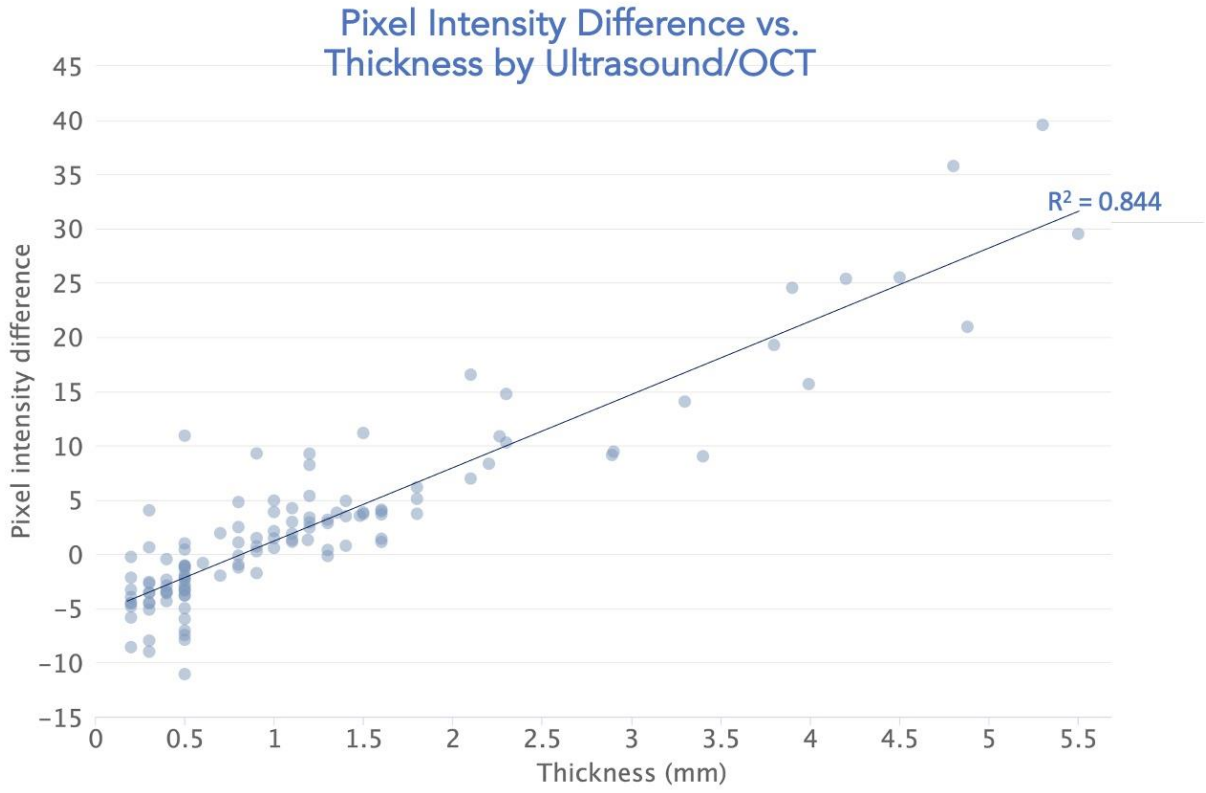
Patients seen by the Ocular Oncology Service (Byers Eye Institute, Stanford University) with clinically-diagnosed MCL underwent clinical examination, UWF imaging, and standardized B-scan ultrasonography (Eye Cubed, Australia). UWF images were post-processed to isolate the green-wavelength-only image. Using ImageJ (National Institutes of Health, USA), average pixel intensities within the lesion and of the adjacent retina were obtained, and the difference between both values calculated ("pixel intensity difference"; average lesion intensity minus average adjacent retina intensity). Pixel intensity difference was plotted against tumor thickness as measured by ultrasonography. The significance of the relationship between both variables was assessed by linear regression analysis.

Results:

A total of 153 MCL (28 CM and 125 CN) of 153 patients were evaluated. Mean ultrasonographic thickness was 1.2 mm (median: 0.9, range: 0.5-5.5). Mean pixel intensity difference was 2.8 (median: 3.8, range: -11.1–39.6). The linear correlation coefficient for tumor thickness to intensity difference was 0.918 ($p<0.001$), indicating a strong positive correlation between tumor thickness and tumor brightness on green-wavelength imaging. Coefficient of determination (R2) was 0.844. A pixel intensity difference threshold of >5.0 conferred a 100.0% sensitivity and 85% specificity for detection of tumors with thickness >2.0 mm.

Conclusions:

Lesion hyperintensity (brightness) on Optos green-channel correlates with tumor thickness. Choroidal tumor thickness can be rapidly and reliably estimated using 2D UWF images. With additional validation, this method could augment future high-throughput screening and risk stratification of MCL with UWF images alone.


Pixel Intensity Difference vs.
Thickness by Ultrasound/OCT
Pixel intensity difference
Thickness (mm)
R² = 0.844
45
40
35
30
25
20
15
10
5
0
−5
−10
−15
0
0.5
1
1.5
2
2.5
3
3.5
4
4.5
5
5.5

Abstract 142

CHOROIDAL THICKNESS IN HEALTHY EYES MEASURED BY ULTRA-WIDEFIELD OPTICAL COHERENCE TOMOGRAPHY.

Oral

Eslava B.*, Bryan S., Puertas M., Ruiz Medrano J., Ruiz Moreno J.M.

Puerta de Hierro Universitary Hospital ~ Madrid ~ Spain

Purpose:

To analyse choroidal thickness in healthy eyes by Ultra-Widefield swept-source optical coherence tomography (UW-OCT).

Methods:

Cross-sectional study. Exclusion criteria were axial length (AL) > 26mm and previous ocular or systemic pathology. Posterior pole choroidal thickness (subfoveal, nasal, temporal, superior and inferior quadrants) was manually measured at 2000µ intervals along 23mm of B-scan images using Xephilio UW-OCT (Canon, Japan) by two masked observers.

Results:

Out of the total 150 eyes, 66,6% were women, mean age was 41,03 ±21,82 years-old (18-72), mean AL 24,09 ±1,11mm(22,56-25,82). Mean subfoveal choroidal thickness
303,33 ±80,195µm (172-474).
Female choroidal thickness was higher compared to men in subfoveal region and each quadrant ($p<0.05$). Strong positive lineal correlation was found between subfoveal choroidal thickness and the 4 quadrants at 2000µm, obtaining Pearson's r equal to 0.75 (nasal), 0.63 (temporal), 0.59 (superior) and 0.766 (inferior)($p<0.05$). No statistically differences were found regarding age nor AL . Intraclass correlation coefficient was 0.862 in subfoveal measure, 0.744 in nasal quadrant, 0.873 temporal, 0.813 superior and 0.838 inferior.

Conclusions:

Choroidal thickness in female patients was thicker than male patients. Subfoveal choroidal thickness was strong linearly correlated with choroidal thickness in the 4 quadrants, decreasing as it distanced from foveal region. To the best of our knowledge this is the first choroidal analysis made by UW-OCT in healthy eyes.

Abstract 89

SPONTANEOUS CLOSURE OF FULL-THICKNESS MACULAR HOLE AFTER VITRECTOMY FOR RETINAL DETACHMENT: EVIDENCE OF ELLIPSOID ZONE RESTORATION

Oral

Pellegrini F.[1], Fossataro F.*[2], Fossataro C.[3], Rizzo C.[4], Rizzo S.[3]

[1]ASFO - DEPARTMENT OF OPHTHALMOLOGY PORDENONE ~ PORDENONE ~ Italy, [2]DEPARTMENT OF OPHTHALMOLOGY - MELEGNANO ~ MELEGNANO (MI) ~ Italy, [3]Department of Ophthalmology, Fondazione Policlinico A. Gemelli, IRCCS ~ ROME ~ Italy, [4]Department of Ophthalmology, Università di Verona, Verona – Italy ~ Verona ~ Italy

Purpose:

To describe a case of spontaneous full thickness macular hole (FTMH) generation and spontaneous closure after pars plana vitrectomy (PPV) for a macula sparing rhegmatogenous retinal detachment (RRD), and discuss the current evidence of ellipsoid zone (EZ) restoration.

Methods:

retrospective single case report

Results:

A pseudophakic 69-year-old man underwent PPV for a macula-sparing superior RRD in the right eye (RE). Best corrected visual acuity (BCVA) was 20/20 before surgery. Three weeks later, the patient complained about visual impairment, and a FTMH was detected at fundus examination and confirmed by optical coherence tomography (OCT) scan. The patient was scheduled for a repeated surgery, but FTMH spontaneously closed after eighteen days. During the follow up, the visual acuity progressively improved along with the EZ restoration, until a complete functional and morphological recovery. When the EZ was completely restored, the BCVA was

Conclusions:

To the best of our knowledge, this is the most rapid case of FTMH generation and spontaneous closure after macula-sparing RRD repair reported in the scientific literature. Moreover, it provides evidence of EZ restoration after spontaneous FTMH closure.

Abstract 91

DESIGN OF A GLOBAL PHASE 2 RANDOMIZED, PLACEBO-CONTROLLED TRIAL OF THE ORAL FACTOR D INHIBITOR DANICOPAN IN GEOGRAPHIC ATROPHY

Poster

Bandello F.*[1], Moshfeghi D.[2], Lad E.[3], Brown D.[4], Jingbo L.[5], Vardi M.[5], Gao A.[5], Sadda S.[6], Holz F.[7], Jaffe G.[3]

[1]Università Vita-Salute San Raffaele ~ Milan ~ Italy, [2]Stanford University School of Medicine ~ Palo Alto ~ United States of America, [3]Department of Ophthalmology, Duke University ~ Durham ~ United States of America, [4]Retina Consultants ~ Houston ~ United States of America, [5]Alexion, AstraZeneca Rare Disease ~ Boston ~ United States of America, [6]Doheny Eye Institute, Department of Ophthalmology, UCLA ~ Pasadena ~ United States of America, [7]Department of Ophthalmology, University of Bonn ~ Bonn ~ Germany

Purpose:

Geographic atrophy (GA) secondary to age-related macular degeneration (AMD) is a progressive degenerative disease leading to vision loss that lacks approved therapies. A randomized, placebo-controlled trial (RCT) is evaluating the efficacy and safety of the oral complement factor D inhibitor danicopan in patients with GA.

Methods:

A global phase 2 RCT with 6-week screening and 104-week double-masked treatment is enrolling 332 patients ≥60 years with non-center involving GA in ≥1 eye (lesions: 0.5-17.76 mm2) and without neovascular AMD in the study eye (EudraCT: 2021-001198-22). Randomization is 1:1:1:1 to danicopan 100 or 200 mg BID, 400 mg QD, or placebo. The primary endpoint is change from baseline in square root of total GA lesion area at week 52. The trial includes a range of secondary outcome measures, including best-corrected and low-luminance visual acuity scores, and incidence rates of treatment-related adverse events.

Results:

The RCT is currently enrolling participants in multiple countries.

Conclusions:

This is the first global phase 2 RCT to evaluate the efficacy and safety of an oral factor D inhibitor in patients with GA.

Abstract 53

CAPTURING THE TRANSITION FROM INTERMEDIATE TO NEOVASCULAR AMD: LONGITUDINAL INNER RETINAL THINNING AND FACTORS ASSOCIATED WITH NEURONAL LOSS

Oral

Barresi C.*[1], Borrelli E.[1], Lari G.[1], Berni A.[1], Battista M.[1], Reibaldi M.[2], Cascavilla M.L.[1], Bandello F.[1]

[1]Vita-Salute San Raffaele University ~ Milan ~ Italy, [2]Department of Ophthalmology, University of Turin ~ Turin ~ Italy

Purpose:

To estimate the impact of transition from intermediate to exudative neovascular age-related macular degeneration (AMD) on the inner retina and to assess the relationship of clinical characteristics and optical coherence tomography (OCT) findings with inner retinal changes.

Methods:

A total of 80 participants (80 eyes) with intermediate AMD at baseline who developed neovascular AMD within 3 months were included in the analysis. OCT scans at follow-up visits (after transition to neovascular AMD) were compared with values at the latest visit with evidence of intermediate AMD to quantify longitudinal inner retinal changes. OCT images were also reviewed for qualitative features reflecting a distress of the outer retina or retinal pigment epithelium and for presence and characteristics of exudation.

Results:

The parafoveal and perifoveal inner retinal thicknesses were 97.6±12.9 µm and 103.5±16.2 µm at baseline and a significant increase in values was detected at the visit with first evidence of neovascular AMD (99.0±12.8 µm, p=0.025; 107.9±19.0 µm, p<0.0001). Conversely, the inner retina was significantly thinner at the 12-month follow-up visit following the initiation of anti-VEGF therapy (90.3±14.8 µm, p<0.0001; 92.0±21.3 µm, p<0.0001). At the 12-month follow-up visit, OCT evidence of alterations of the external limiting membrane and history of previous intraretinal fluid were associated with a greater inner retinal thinning.

Conclusions:

The development of exudative neovascularization is associated with significant neuronal loss that may be detected once the exudation is resolved. OCT analysis demonstrated a significant relationship between morphological alterations detected using structural OCT and the amount of inner neuronal loss.

Abstract 216

TREAT AND EXTEND VERSUS PRO RE NATA (PRN) TREATMENT MODALITIES IN POLYPOIDAL CHOROIDAL VASCULOPATHY

Poster

Rouvas A.[1], Bouratzis N.*[2], Gouliopoulos N.[1]

[1]2nd Department of Ophthalmology, Attikon Hospital, National and Kapodistrian University of Athens, Athens, Greece ~ Athens ~ Greece, [2]Specialized Eye Hospital Ophthalmiatreion Athinon ~ Athens ~ Greece

Purpose:

To determine the preferable treatment regimen (treat-and-extend and pro re nata (PRN) with aflibercept) in the maintenance phase of polypoidal choroidal vasculopathy (PCV), by comparing the 1-year outcomes of visual acuity (VA), rates of recurrence and developed fibrosis, and the number of intravitreal injections

Methods:

Naive and previously untreated PCV patients were included in our prospective study. The loading phase consisted of a session of photodynamic therapy (PDT) and three monthly intravitreal injections of 2.0 mg aflibercept (IAIs) (38 eyes) Afterwards, the eyes were re-examined and 30 of them without any exudative phenomena were included in the study. They were divided in 2 groups; in the first one (16 patients) the PRN treatment modality was applied, while in the second one (14 patients) the treat-and-extend regimen was applied.

Results:

Over the study period (12 months), VA significantly improved in treat-and-extend group and remained stable in the PRN group. Moreover, the patients of treat-and-extend group did not encounter development/progression of fibrosis or any recurrent episodes, whereas the patients of PRN group faced significantly more recurrent episodes and the frequency of development/progression of fibrosis was significantly higher. However, the treat-and-extend treatment regimen was accompanied by a significantly elevated number of IAIs.

Conclusions:

We underlined the efficacy and superiority of treat-and-extend regime with IAIs, which seems to yield better functional outcomes since it was accompanied by lower recurrence and subfoveal fibrosis rates, although a greater number of injections was required.

Abstract 119

INTRARETINAL FLUID IN INTERMEDIATE AGE-RELATED MACULAR DEGENERATION

Oral

Servillo A.*[1], Kesim C.[4], Sacconi R.[1], Fragiotta S.[2], Parravano M.[3], Capuano V.[5], Souied E.[5], Bandello F.[1], Querques G.[1]

[1]IRCCS San raffaele ~ Milan ~ Italy, [2]UniCamillus university ~ Roma ~ Italy, [3]Fondazione Bietti ~ Rome ~ Italy, [4]Koç University School of Medicine ~ Istanbul ~ Turkey, [5]Centre Hospitalier Intercommunal ~ Cretèil ~ France

Purpose:

To describe the occurrence of intraretinal fluid (IRF) in intermediate age-related macular degeneration (iAMD)

Methods:

A retrospective study was designed to include consecutive cases with iAMD associated with IRF. Multimodal imaging (MMI) was used to confirm diagnosis of IRF in iAMD along with absence of macular neovascularization (MNV). MMI included color fundus photograph (CFP), fundus autofluorescence (FAF), fluorescein angiography (FA), indocyanine green angiography (ICGA), optical coherence tomography (OCT) and OCT angiography (OCT-A)

Results:

Six eyes of 6 patients (2 males and 4 females, ages 66-75) showing IRF in iAMD were included in the study. Mean best-corrected visual acuity was 0.14 FA, ICGA, OCT and OCT-A demonstrated the absence of MNV in all cases; OCT-A did not detect any abnormal flow signal associated with IRF. Three out of 6 eyes presented large drusenoid retinal pigment epithelial detachment, 1 out of 6 eyes presented isolate large drusen, and 2 out of 6 eyes presented confluent large drusen. Reticular pseudodrusen were detected in 1 out of 2 eyes with confluent large drusen.

Conclusions:

Intraretinal fluid in non-neovascular AMD is a novel, distinctive feature that is characterized by the presence of IRF with no evidence of MNV. The definite diagnosis of this condition within the spectrum of AMD disorders and the assessment of its clinical impact requires further studies with thorough application of MMI

Abstract 23

PATIENTS' SATISFACTION ASSESSMENT IN WAMD MANAGEMENT: AN ITALIAN PATIENT SURVEY (THE SWAN STUDY)

Oral

Peiretti E.*[1], Bandello F.[2], Boscia F.[3], Staurenghi G.[4], Varano M.[5], Ascardi C.[6], Bartezaghi M.[6], De Santi L.[6]

[1]Clinica Oculistica, San Giovanni di Dio Hospital, Azienda Ospedaliera Universitaria di Cagliari ~ Cagliari ~ Italy, [2]Department of Ophthalmology, San Raffaele Scientific Institute, Vita-Salute University ~ Milan ~ Italy, [3]Department of Medical Science, Neuroscience and Sense Organs, Eye Clinic, University of Bari, Azienda Ospedaliero-Universitaria Policlinico Bari ~ Bari ~ Italy, [4]Ophthalmology Clinic, Department of Biomedical and Clinical Sciences "Luigi Sacco," Luigi Sacco Hospital, University of Milan ~ Milan ~ Italy, [5]IRCCS G.B. Bietti Foundation ~ Rome ~ Italy, [6]Novartis Farma S.p.A ~ Milan ~ Italy

Purpose:

Despite anti-VEGF proven clinical efficacy in wAMD, the number of follow up visits as well as frequency of injections represent a substantial burden for patients, caregivers, physicians and the healthcare system.
Patients' satisfaction in the whole disease management is crucial to increase their engagement in treatment and ultimately clinical outcomes.

Methods:

SWAN study is a cross-sectional real-world evidence study to assess the satisfaction of patients treated with currently available anti-VEGFs in Italy. Two questionnaires were used to explore patient's satisfaction: Macular Disease Treatment Satisfaction Questionnaire (MacTSQ) and a new Novartis-developed tailored Treatment Satisfaction questionnaire (NVS -TTSQ). This one was specifically created for the SWAN study involving a focus group of wAMD patients and expert patients as advisors. Both questionnaires were administered during a phone call, leveraging an innovative artificial intelligence digital system, able to collect patient's answers and convert it into measurable data.

Results:

181 patients in five centers across Italy were enrolled into the study. According to NVS – TTSQ, patients were satisfied on their disease management especially on how they were diagnosed and on they were informed about treatment administration [median (min-max): 41 (20-54)]. Patients treated > 1 year reported more need to ask for advice on their disease management especially than patients treated < 1 year [median 5 vs 3]. Patients that have received less than 6 IVIs declared less need to discuss about disease management than patients that have received more than 6 injections [median 4.5 vs 3].

Conclusions:

Italian patients are overall satisfied about disease management. Nevertheless, patients treated for more than one year, who received more than six injections expressed the need for additional information on their disease. This highlights how communicating chronicity and management of a chronic condition like wAMD might be further improved.

Abstract 71

TREAT AND EXTEND VERSUS PRO RE NATA REGIMENS IN NEOVASCULAR AGE-RELATED MACULAR DEGENERATION: RETROSPECTIVE COMPARATIVE STUDY IN A CLINICAL PRACTICE SETTING.

Oral

Monaco P.*[1], Del Borrello M.[1], Airaldi M.[2], Tozzi L.[1], De Robertis D.[1], Tollot L.[1], Invernizzi A.[2]

[1]Ophthalmology Department, San Martino Hospital ~ Belluno ~ Italy, [2]Eye Clinic - Department of Biomedical and Clinical Science "Luigi Sacco" ~ Milano ~ Italy

Purpose:

To compare efficacy of anti-Vascular Endothelial Growth Factor (VEGF) medications following pro re nata (PRN, injections only in case of active disease) or treat and extend (T&E, extension of treatment intervals up to 12 weeks depending on the clinical findings) protocols in real-practice conditions throughout two years.

Methods:

89 treatment-naïve eyes from 78 exudative age-related macular degeneration patients enrolled in the Fight Retinal Blindness! registry were identified and retrospectively reviewed: 47 eyes (PRN group) and 42 eyes (T&E group). Subjects having a follow-up of at least 24 months were defined as completers. The primary outcome was visual acuity (VA) change at 2 years, other outcomes included number of intravitreal anti-VEGF injections, proportion of active visits and incidence of macular atrophy and subretinal fibrosis. Calculation of visual outcomes over 24 months used the last-observation-carried-forward (LOCF) for non-completers.

Results:

Final VA using LOCF for non-completers was similar (median [IQR], 65 [55, 75] vs. 62 [35, 71.5] LogMAR letters, p = .35), as well as adjusted VA change from baseline (mean [95% CI], 0.6 [-4.4, 5.7] vs. -2.2 [-7.4, 3] letters, p = .44). T&E patients received significantly more injections (median [IQR], 7.5 [5, 9.2] vs. 10.5 [8.8, 12], p < .001). T&E was significantly associated with fibrosis compared to PRN (31% vs 63% at 2 years, HR = 4, p < .001) but not with macular atrophy (12% vs. 52% at 2 years, HR = 1.8, p = .28).

Conclusions:

In our study the T&E protocol permitted a reduction of the evaluations improving the patient's compliance. The mean change in VA was similar with a dropping after 18 months in the T&E group. VA trend was more stable with less variations until 18 months in the T&E.

Abstract 133

FIRST REAL-LIVE DATA ON EFFICACY AND SAFETY OF FARICIMAB IN NEOVASCULAR AGE-RELATED MACULAR DEGENERATION (NAMD) AND DIABETIC MACULAR EDEMA (DME) IN SWITZERLAND

Oral

Daniel Rudolf M.*, Sandrine Anne Z.

Department of Ophthalmology, University Hospital Zurich, University of Zurich, Switzerland ~ Zurich ~ Switzerland

Purpose:

To evaluate efficacy and safety of Faricimab (Roche Vabysmo®) under real life conditions in patients with persistent activity of neovascular AMD or DME after switch from anti-VEGF treatment with Aflibercept (Bayer Eylea®) or Ranibizumab (Novartis Lucentis®).

Methods:

Single-center, retrospective, clinical study conducted at the Department of Ophthalmology, University Hospital Zurich. Patients that had been treated with Faricimab from 07/2022 until 09/2022 were enrolled. Inclusion criteria were persistent disease activity under anti-VEGF treatment with Aflibercept or Ranibizumab. The previous treatment interval had to be 6 weeks or shorter. The following parameters were assessed and evaluated at baseline and 4 weeks after the first Faricimab injection: Central subfield thickness (CST) intraretinal and subretinal fluid as recorded by optical coherence tomography (OCT), clinical signs of anterior or posterior segment inflammation or retinal vasculitis and change in best-corrected visual acuity (BCVA).

Results:

16 eyes/patients were included, divided into two groups by diagnosis: AMD (nAMD=10), DME (nDME=6). Mean number of antiVEGF injections at baseline was 36±15 (range:20-60) for AMD and 14±6 (range:8-24) for DME. Mean treatment interval before switch was 5.0±1.2 for AMD and 4.0±0.0 weeks for DME. Mean BCVA change baseline-week4 was +1.1±5.2 for AMD and +3.2±4.5 letters for DME, which was not significant (Wilcoxon: AMD: p=0.28450; DME: p=0.14413). Mean CST change baseline-week4 was of -29.6±40.7µm for AMD and -33.2±19.7µm for DME. The CST change was statistically significant (Wilcoxon: AMD: p=0.04685; DME: p=0.04311). No adverse events related to Faricimab were recorded.

Conclusions:

To our knowledge, we present the first real-live data on intravitreal Faricimab in Switzerland. In our dataset, no complications occurred, CST was significantly reduced, BCVA-change was insignificant at week 4. If Faricimab proves to be significantly more effective in a real-life setting must be subject of subsequent long-term studies.

Abstract 87

EFFICACY OF INTRAVITREAL PEGCETACOPLAN IN GEOGRAPHIC ATROPHY: 24-MONTH RESULTS FROM THE OAKS AND DERBY PHASE 3 TRIALS

Oral

Gale R.*[1], Holz F.G.[2], Lad E.G.[3], Staurenghi G.[4], Bliss C.[5], Ribeiro R.[5]

[1]University of York ~ York ~ United Kingdom, [2]University of Bonn ~ Bonn ~ Germany, [3]Duke Eye Center ~ Durham ~ United States of America, [4]Luigi Sacco Hospital ~ Milan ~ Italy, [5]Apellis Pharmaceuticals ~ Waltham ~ United States of America

Purpose:

To report final 24-month efficacy results of two phase 3, randomized, double-masked, sham-controlled clinical trials comparing the efficacy and safety of monthly or every-other-month (EOM) intravitreal pegcetacoplan with sham in patients with geographic atrophy (GA) secondary to age-related macular degeneration.

Methods:

Patients are ≥60 years old, have best-corrected visual acuity (BCVA) ≥24 letters, and GA area between 2.5–17.5mm2 or one focal lesion ≥1.25mm2 if multifocal GA was present at baseline. Change in GA lesion size, as measured by fundus autofluorescence, from baseline to Month 12 (primary endpoint) and from baseline to Month 24 were assessed. Other key endpoints at Month 24 include reading speed; mean Functional Reading Independence index score and normal luminance-BCVA. Additionally, change from baseline in mean threshold sensitivity was assessed by microperimetry at Month 24 in OAKS.

Results:

The primary efficacy endpoint at Month 12 was met in OAKS but not DERBY. At Month 12, OAKS showed a statistically significant reduction in GA lesion growth vs sham in the monthly and EOM arms by 21% (p=0.0004) and 16% (p=0.0055), respectively. DERBY did not reach statistical significance; pegcetacoplan decreased GA lesion growth vs sham by 12% (p=0.0609, monthly) and 11% (p=0.0853, EOM). Month 18 data were generally consistent with Month 12 data, with effects in DERBY over Months 6–18 more closely resembling those in OAKS. Final 24-month efficacy results from OAKS and DERBY will be presented here.

Conclusions:

Pegcetacoplan met the primary endpoint in OAKS, demonstrating a significant reduction in GA lesion growth compared with sham. In DERBY, the reduction in GA lesion growth did not meet statistical significance. Twenty-four-month efficacy results will be presented here.

Abstract 165

ASSOCIATION OF AGE-RELATED MACULAR DEGENERATION ON ALZHEIMER OR PARKINSON DISEASE

Oral

Jee D.*

St. Vincent Hospital, The School of Medicine, The Catholic University of Korea ~ Suwon, Seoul ~ Korea, Republic of

Purpose:

To determine the association of age-related macular degeneration (AMD) with Alzheimer disease (AD) and Parkinson disease (PD).

Methods:

The study population consisted of 308,340 participants aged 50 years or older from the Korean National Health Insurance Service-Health Screening Cohort. After exclusion of participants with AMD during 2002, participants were detected for AMD during 2003-2005. Starting from January 1, 2006, all participants were followed up for AD and PD until December 31, 2013. Multivariate Cox proportional hazards regression was used to calculate the adjusted hazard ratios (aHRs) and 95% confidence intervals (CIs) for AD and PD risk.

Results:

Compared to non-AMD participants, AMD patients had higher risk for AD (aHR 1.48) and PD (aHR 1.46). The risk-increasing association of AMD with AD (aHR 2.25, 95% CI 1.39-3.66) and PD (aHR 2.02, 95% CI 1.00-4.08) were preserved among participants who were never-smokers, did not consume alcohol, and exercised regularly. Finally, AMD was associated with higher risk of AD (aHR 1.96, 95% CI 1.46-2.65 for age <70 years and aHR 1.53, 95% CI 1.26-1.86 for age ≥70 years) and PD (aHR 1.90, 95% CI 1.29-2.80 for age <70 years and aHR 1.47, 95% CI 1.06-2.04 for age ≥70 years).

Conclusions:

Compared to non-AMD participants, AMD patients had higher risk for AD and PD even among those with healthy lifestyle behaviors. Patients with AMD must be closely monitored for possible subsequent development of AD or PD.

Table 2. Hazard Ratios for Alzheimer Disease and Parkinson Disease According to Age-Related Macular Degeneration

Outcome	Without AMD	With AMD
Alzheimer disease		
Events	7,308	149
Person-years	2,319,449	15,710
aHR (95% CI)	1.00 (reference)	1.48 (1.25-1.74)
Parkinson disease		
Events	3,487	63
Person-years	2,341,484	16,164
aHR (95% CI)	1.00 (reference)	1.46 (1.14-1.88)

Table 3. Sensitivity Analysis on the Association of Age-Related Macular Degeneration With Alzheimer Disease and Parkinson Disease Among Participants With Healthy Lifestyle Behaviors

Outcome	Adjusted Hazard Ratio (95% Confidence Interval)	
	Without AMD	With AMD
Alzheimer disease		
Never-smokers	1.00 (reference)	1.57 (1.33-1.87)
Non–alcohol drinkers	1.00 (reference)	1.50 (1.25-1.79)
Regular exercise[a]	1.00 (reference)	1.79 (1.15-2.79)
Healthy lifestyle behaviors[b]	1.00 (reference)	2.25 (1.39-3.66)
Parkinson disease		
Never-smokers	1.00 (reference)	1.41 (1.07-1.86)
Non–alcohol drinkers	1.00 (reference)	1.44 (1.09-1.90)
Regular exercise[a]	1.00 (reference)	1.87 (1.02-3.40)
Healthy lifestyle behaviors[b]	1.00 (reference)	2.02 (1.00-4.08)

Table 4. Sensitivity and Stratified Analyses on the Association of Age-Related Macular Degeneration With Alzheimer Disease and Parkinson Disease After Excluding Participants Diagnosed With Alzheimer Disease or Parkinson Disease Within the First 3 Years of Follow-up and According to Age Group

Analysis	Adjusted Hazard Ratio (95% Confidence Interval)	
	AD	PD
Washout period		
1 year	1.47 (1.24-1.73)	1.49 (1.15-1.94)
2 years	1.48 (1.25-1.77)	1.61 (1.23-2.10)
3 years	1.48 (1.25-1.77)	1.61 (1.23-2.10)
Age, years		
<70	1.96 (1.46-2.65)	1.90 (1.29-2.80)
≥70	1.53 (1.26-1.86)	1.47 (1.06-2.04)

Abstract 86

TEN-YEAR INCIDENCE OF FIBROSIS AND RISK FACTORS FOR ITS DEVELOPMENT IN NEOVASCULAR AGE-RELATED MACULAR DEGENERATION.

Oral

Romano F.*[1], Cozzi E.[1], Airaldi M.[1], Nassisi M.[2], Viola F.[2], Aretti A.[2], Milella P.[2], Teo K.C.[3], Cheung G.[3], Staurenghi G.[1], Invernizzi A.[1]

[1]Luigi Sacco Hospital ~ Milan ~ Italy, [2]IRCCS Ca' Granda Ospedale Maggiore Policlinico ~ Milan ~ Italy, [3]Singapore National Eye Center ~ Singapore ~ Singapore

Purpose:

To report the cumulative incidence and risk factors for fibrosis at 10 years of follow-up in a large cohort of neovascular age-related macular degeneration (nAMD) patients at two referral centers in Milan.

Methods:

Retrospective, multicenter, observational study. We included 225 naïve nAMD eyes (207 patients) who underwent intravitreal anti-vascular endothelial growth factor (VEGF) treatment over 10 years. Clinical and imaging data on the characteristics of macular neovascularization (MNV) were reviewed at baseline. Visual acuity (VA), central subfield thickness (CST), lesion activity, number of injections and of submacular hemorrhages were collected on an annual basis. Fibrosis onset was defined clinically assessing color photographs, fundus descriptions or fluorescein angiograms. Optical coherence tomography (OCT) scans obtained at fibrosis onset were inspected by an external reading center and graded as sub-retinal pigment epithelium (RPE), mixed or sub-retinal.

Results:

Mean[SD] age at baseline was of 72.1[6.9] years. Incidence rate of fibrosis was estimated as 8.9 per 100 person-years with a cumulative incidence of 62.7% at 10 years. On OCT, 46.1% of fibrotic lesions were graded as sub-RPE, 29.8% as mixed and 22.7% as subretinal.
Independent factors associated with fibrosis included: larger CST variation ($p<0.001$), submacular hemorrhages ($p=0.008$), higher number of injections ($p=0.01$), lower baseline VA ($p=0.03$). Type 2 (classic) MNV was significantly associated with both mixed and sub-retinal fibrosis.
At 10 years VA declined of -16.4 letters from baseline, particularly in the presence of mixed and sub-retinal fibrosis ($p<0.001$).

Conclusions:

We found a 62.7% cumulative incidence of fibrosis in a large nAMD cohort at 10 years of follow-up. Fibrosis was more common with frequent reactivations and lower baseline VA; its onset significantly impacted on final visual outcomes. This supports the hypothesis that nAMD should be promptly treated with pro-active regimens.

Abstract 135

CAN ANTI-VEGF TREATMENT INFLUENCE CHOROIDAL THICKNESS? – A RETROSPECTIVE STUDY OF PATIENTS WITH EXUDATIVE AGE-RELATED MACULAR DEGENERATION

Oral

Moleiro A.F.*, Rodigues R., Vilares--Morgado R., Falcão--Reis F., Carneiro Â., Falcão M.

São João University Hospital Center ~ Porto ~ Portugal

Purpose:

To evaluate choroidal thickness (CT) progression over time in patients with exudative age-related macular degeneration (AMD) and its relation with anti-VEGF treatment.

Methods:

Retrospective case series study of patients observed between January 2022 and April 2022 at Ophthalmology Department of our center diagnosed with bilateral exudative AMD (eAMD) or unilateral eAMD and intermediate AMD (iAMD) in contralateral eye with a minimum previous follow up of two years. Subfoveal CT was measured in both eyes using cross-sectional spectral domain optical coherence tomography images, obtained every year during follow-up period. Statistical analysis was performed to correlate CT variation with number of intravitreal injections. 66 eyes with eAMD and 20 eyes with iAMD from 43 patients (mean age, 81.15□6.10 years) followed during 7.15□2.65 years were included.

Results:

eAMD eyes were treated with 54.83 (range 6-100 injections) anti-VEGF intravitreal injections. CT of eyes with eAMD decreased 56.65□11.66 µm over the follow-up period ($p<0.001$) at a rate of 6.49 µm per year. CT of eyes with iAMD decreased 29.30□22.07 µm over the follow-up period ($p>0.2$) at a slower rate of 0.68 µm per year. In the subgroup of patients with unilateral eAMD and contralateral iAMD (n=20) CT changes were significantly different between the two eyes ($p< 0.001$). Number of intravitreal injections correlated inversely with CT in eyes with eAMD ($r = −0.232$; $p<0.001$).

Conclusions:

A significant thinning of choroid in eyes with eAMD and an inverse correlation with number of anti-VEGF injections was observed, suggesting the influence of prolonged anti-VEGF suppression on choroidal thickness decrease. Further studies with a higher number of eyes are needed to validate our results.

Abstract 98

SAFETY OF INTRAVITREAL PEGCETACOPLAN IN GEOGRAPHIC ATROPHY: 24-MONTH RESULTS FROM THE OAKS AND DERBY PHASE 3 TRIALS

Oral

Tadayoni R.*[1], Bandello F.[2], Boyer D.S.[3], Wykoff C.C.[4], Bliss C.[5], Ribeiro R.[5]

[1]Université Paris Cité ~ Paris ~ France, [2]University Vita-Salute, Ospedale San Raffaele ~ Milan ~ Italy, [3]Retina-Vitreous Associates Medical Group ~ Los Angeles ~ United States of America, [4]Retina Consultants of Texas ~ Houston ~ United States of America, [5]Apellis Pharmaceuticals ~ Waltham ~ United States of America

Purpose:

To report the final 24-month safety results of two phase 3, randomized, double-masked, sham-controlled clinical trials comparing the efficacy and safety of monthly or every-other-month (EOM) intravitreal pegcetacoplan with sham in patients with geographic atrophy (GA) secondary to age-related macular degeneration (AMD).

Methods:

Included patients are ≥60 years old, have best-corrected visual acuity ≥24 letters, and GA area between 2.5 and 17.5 mm2; if multifocal GA was present at baseline, at least one focal lesion must be ≥1.25 mm2. Enrollment was completed in July 2020. The primary endpoint was change in GA lesion size measured by fundus autofluorescence from baseline to Month 12. Secondary endpoints, including functional outcomes, were measured up to Month 24. Key safety measures include incidences of ocular and systemic adverse events, and incidence of new-onset exudative AMD (eAMD) in the study eye.

Results:

At Month 12, the primary endpoint was met in OAKS but not in DERBY. Overall, pegcetacoplan was well tolerated with ocular treatment-emergent adverse events generally considered mild or moderate. The rate of eAMD was higher in pegcetacoplan-treated patients (6.0% monthly, 4.1% EOM arm) vs sham (2.4%). The rates of infectious endophthalmitis and intraocular inflammation per injection were 0.047% and 0.22%, respectively. The safety profile of pegcetacoplan at 18 months was consistent with that reported at 12 months. The 24-month safety data, including overall adverse events, new-onset eAMD, infectious endophthalmitis, and intraocular inflammation will be presented here.

Conclusions:

Pegcetacoplan was generally safe and well tolerated at Months 12 and 18. Twenty-four-month safety data will be presented.

Abstract 26

CRITICAL ANALYSIS OF TECHNIQUES AND MATERIALS USED IN SYRINGES AND NEEDLES USED FOR INTRAVITREAL INJECTIONS

Oral

Melo G.*[1], Meyer C.[2], Maia M.[1], Rodrigues E.[1]

[1]Federal University of São Paulo ~ São Paulo ~ Brazil, [2]Philipps University of Marburg ~ Marburg ~ Germany

Purpose:

Intravitreal injections are the most commonly performed intraocular treatment. Because they may induce adverse events, awareness of the materials and techniques are essential to reduce these sight-threatening complications. This review provides insights into the needles, syringes, silicone oil coating, syringe handling, anesthesia, and safety issues related to materials and techniques.

Methods:

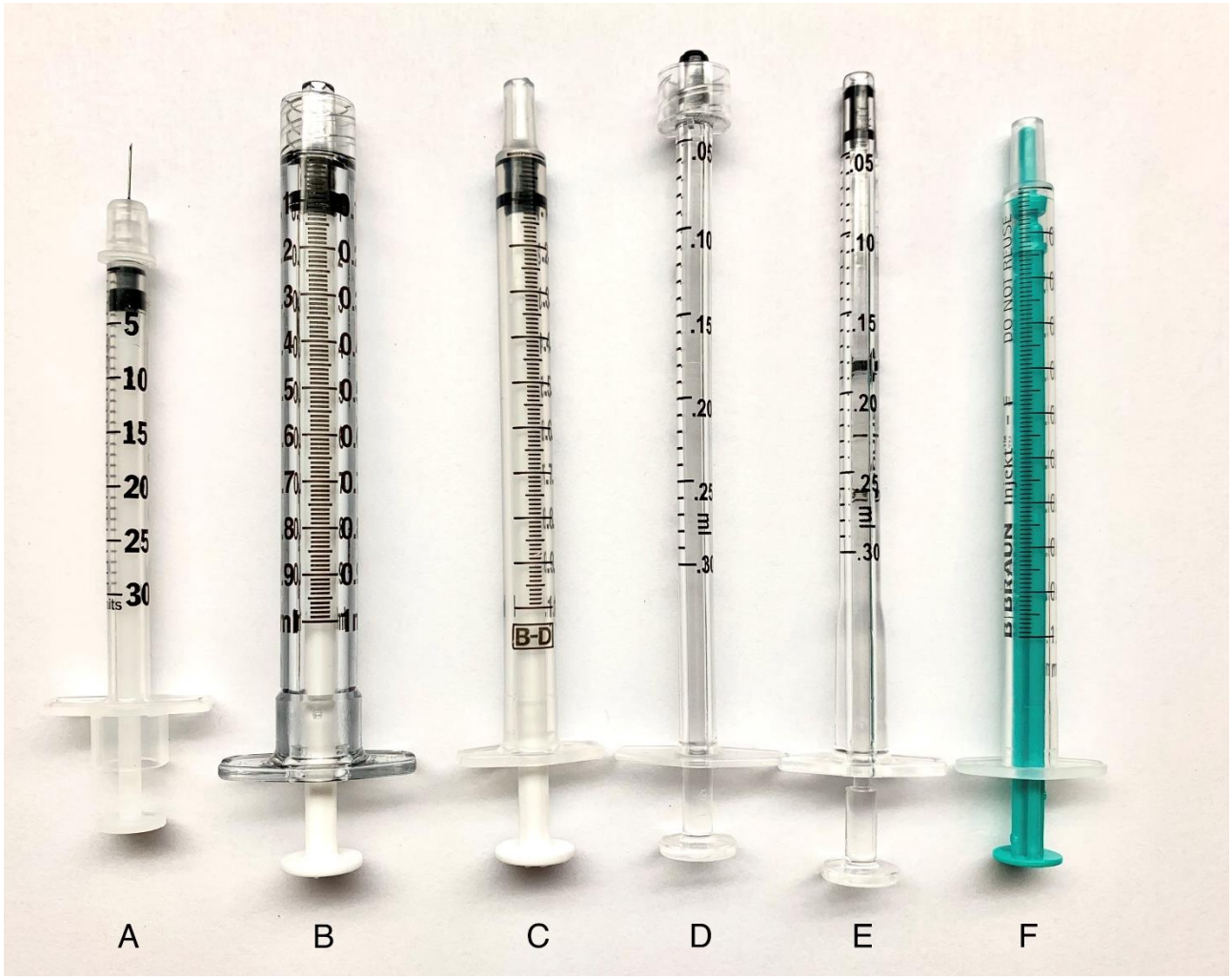
It is paramount that physicians be aware of every step involved in intravitreal injections and consider the roles and implications of all materials and techniques used. The ability to understand the theoretical and practical circumstances may definitely lead to state-of-the-art treatments delivered to patients. This is a review analysis of multiple facets of intravitreal injections, mainly focusing on materials and techniques.

Results:

The most important practical recommendations are: choosing syringes with as little silicone oil as possible, or, preferably, none; avoiding agitation of syringes; awareness that most biologics (e.g., antiangiogenic proteins) are susceptible to changes in molecular properties under some conditions, such as agitation and temperature variation; understanding that improper materials and techniques may lead to complications after intravitreal injections, e.g., inflammation; and recognizing that some devices may contribute to an enhanced, safer, and faster intravitreal injection technique.

Conclusions:

Choosing the most appropriate materials and employing the safest techniques are essential to delivering the best intravitreal injection to our patients.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Abstract 5

MACULAR THICKNESS AND VISUAL ACUITY ARE CHARACTERIZED BY A QUADRATIC NONLINEAR RELATION IN PREVIOUSLY TREATED NEOVASCULAR AMD EYES: RETINAL THICKNESS DEVIATION VALUES BETTER PREDICTS VISUAL FUNCTION.

Oral

Boscia G.B.*[1], Borrelli E.[2], Gelormini F.[1], Ricardi F.[1], Ghilardi A.[1], Reibaldi M.R.[1]

[1]Department of Ophthalmology, University of Turin ~ Turin ~ Italy, [2]Vita-Salute San Raffaele University ~ Milan ~ Italy

Purpose:

Importance: Although many clinical studies utilize retinal thickness to estimate the response in neovascular exudative age-related macular degeneration, relationship between this variable and visual acuity is unclear.
Purpose: To assess the associations between visual acuity and retinal thickness in neovascular AMD eyes previously treated with anti-vascular endothelial growth factor (VEGF) therapy.

Methods:

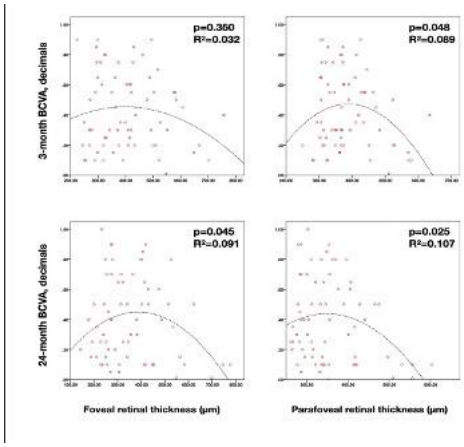
Design: Retrospective study.
Setting: Ophthalmology Department, University of Turin.
Participants: 68 patients (68 eyes) with exudative neovascular AMD undergoing anti-VEGF therapy with two years of follow-up imaging data after the initiation of treatment.
Exposure: Patients underwent a complete ophthalmologic evaluation, including imaging with structural OCT. Linear and nonlinear regression analyses with curve fitting estimation were performed to explore the relationship between visual acuity and OCT-based parameters at the 3-month and 24-month follow-up visits. Regression analyses were also performed between visual acuity and the retinal thickness deviation which was calculated as the absolute value of the difference between measured and normative retinal thickness values.

Results:

Results:In univariate analysis,the visual acuity was not associated with either the foveal(R2=0.011,β=-0.104 and p=0.401 at the 3-month follow-up visit;R2=0.032,β=-0.180 and p=0.142 at the 24-month follow-up visit)or parafoveal(R2=0.045, β=-0.231 and p=0.081 at the 3-month follow-up visit;R2=0.050,β=-.240 and p=0.055 at the 24-month follow-up visit) retinal thicknesses.However,compared with the linear models,a quadratic function yielded a relative increase in the R2 coefficients.In the univariate analysis,the visual acuity was linearly associated with foveal retinal thickness deviation (R2=0.041 and p=0.037 at the 24-month follow-up visit) and parafoveal retinal thickness deviation (R2=0.062 and p=0.040 at the 3-month follow-up visit;R2=0.088 and p=0.014 at the 24-month follow-up visit) values.

Conclusions:

Conclusions:These findings may reflect that early in the treatment course, visual acuity may improve as the retinal thickness decreases,but subsequently, further retinal thinning is associated with a decline in vision.This suggests that deviation-based parameters may be of benefit for structure-function correlations in the context of anti-VEGF therapy for neovascular AMD.


p=0.350
R²=0.032
p=0.048
R²=0.089
3-month BCVA, decimals
p=0.045
R²=0.091
p=0.025
R²=0.107
24-month BCVA, decimals
Foveal retinal thickness (µm)
Parafoveal retinal thickness (µm)

Abstract 178

BILATERAL BROLUCIZUMAB INTRAVITREAL INJECTIONS IN AMD PATIENTS: A BRIEF REPORT

Oral

Vitiello L.*, Abbinante G., Coppola A., Salerno G., Gagliardi V., Pellegrino A.

Eye Unit, "Luigi Curto" Hospital, Polla, ASL Salerno, Salerno, Italy ~ Polla ~ Italy

Purpose:

Brolucizumab is a latest-generation drug approved for age-related macular degeneration (AMD) treatment. Several studies have demonstrated its efficacy, but there is still little evidence on its safety in bilateral treatment. The purpose of this brief report is to evaluate safety and efficacy of bilateral Brolucizumab intravitreal injections in AMD patients.

Methods:

Four AMD patients treated bilaterally with Brolucizumab intravitreal injections were included in this brief report. All patients had a complete ophthalmological examination, including corrected visual acuity assessment, slit-lamp examination, intraocular pressure evaluation, fundus examination and OCT evaluation (Carl Zeiss Cirrus, model 5000). These appraisals were carried out one day before intravitreal injection and repeated the day after and one month later.

Results:

All included patients had three Brolucizumab intravitreal injections in each eye, alternating between the two eyes month by month. None of the patients showed ocular complications related to intravitreal treatment. All the patients had a visual acuity improvement of at least one optotype line for each treated eye, while no significant differences were found for intraocular pressure. At OCT evaluation, there was a significant decrease in intraretinal and subretinal fluid one month after the last injection.

Conclusions:

This brief report points out that bilateral treatment with Brolucizumab does not seem to present an increase in ocular adverse effects and shows a great improvement in the AMD edema. However, further studies are needed to confirm these results.

Abstract 147

BROLUCIZUMAB FOR WET AGE-RELATED MACULAR DEGENERATION: ONE-YEAR REAL-WORLD EXPERIENCE FROM A TERTIARY CENTER

Oral

Carlà M.M.*, Scupola A., Boselli F., Giannuzzi F., De Filippis A., Fossataro C., Minnella A.M., D"Amico G., Coppola G., Savastano M.C., Sammarco M.G., Rizzo S.

Ophthalmology Department, "Fondazione Policlinico Universitario A. Gemelli, IRCCS" ~ Rome ~ Italy

Purpose:

To explore the early efficacy and safety of treatment with intravitreal injections of brolucizumab in patients presenting neovascular age-related macular degeneration (nAMD) in a real-world setting.

Methods:

This retrospective study included 194 eyes of 180 patients with nAMD treated with standard 6 mg intravitreal injections (IVT) of brolucizumab by 4 retinal specialists of the same center between 11 March 2021 and 15 June 2022. Both treatment-naive (33 eyes) and switch-therapy patients (161 eyes) were included in the study. Best corrected visual acuity (BCVA), central subfield thickness (CST), retinal fluid distribution (classified as intraretinal fluid, IRF; subretinal fluid, SRF; under the pigmented epithelium fluid, sRPEF), treatment intervals and adverse event rate were collected for analysis.

Results:

Average follow-up time was 37.2±16.6 weeks. Mean baseline BCVA were 38.1±4.5 and 41.9±6.7 letters in the treatment-naive and switch-therapy groups, with a final gain of 16.0±4.9 ($p<0.0001$) and 10.7±5.9 ($p<0.0001$) letters in the two groups, respectively. Throughout the study period, CST significantly decreased in both treatment-naïve (from 352.0±129.4 to 284.2±93.8 µm; $p=0.0015$) and switch-therapy (from 369.9±140.5 to 307.4±123.5 µm; $p<0.0001$) groups. Significant fluid control rates were achieved at the end of the study period (45% and 27% eyes were completely free-of-fluid in naïve and switch groups, respectively). Five eyes in the switch-therapy group developed adverse events without affecting clinical results.

Conclusions:

Brolucizumab IVTs showed a very good anatomical and functional outcomes in both naive and switch patients in this real-world experience. The incidence of intraocular inflammation (IOI) reported rates were in line with post hoc safety analysis of HAWK and HARRIER data.

Localization	Treatment-Naïve	Therapy Switch
IRF	**n=28**	**n=96**
Resolved (%)	17 (61%)	42 (44%)
Reduction (%)	10 (36%)	26 (27%)
Stability (%)	0 (0%)	17 (18%)
Increase (%)	1 (3%)	11 (11%)
SRF	**n=19**	**n=82**
Resolved (%)	14 (74%)	39 (48%)
Reduction (%)	4 (21%)	28 (34%)
Stability (%)	0 (0%)	8 (10%)
Increase (%)	1 (5%)	7 (8%)
sRPEF	**n=22**	**n=134**
Resolved (%)	14 (64%)	58 (44%)
Reduction (%)	4 (18%)	35 (26%)
Stability (%)	4 (18%)	34 (25%)
Increase (%)	0 (0%)	7 (5%)

Table 3. Analysis of the OCT parameters of exudation.

OCT = optical coherence tomography; IRF = intra-retinal fluid; SRF = sub-retinal fluid; sRPEF = sub retinal pigmented epithelium fluid

Abstract 30

MECHANISMS OF STERILE INFLAMMATION AFTER INTRAVITREAL INJECTION OF ANTIANGIOGENIC DRUGS

Oral

Melo G.*[1], Anderson W.[2], Cruz N.[1], Lima L.[1], Rodrigues E.[1]

[1]Federal University of São Paulo ~ São Paulo ~ Brazil, [2]Saint Louis University ~ Saint Louis ~ United States of America

Purpose:

Intraocular inflammation is an uncommon but potentially vision-threatening adverse event related to anti-VEGF therapy. This is of increasing importance given both the volume of injections performed. Reviewing potential mechanisms and clinical differences of intraocular inflammation may assist clinicians and scientists in reducing the risk of these events in the future.

Methods:

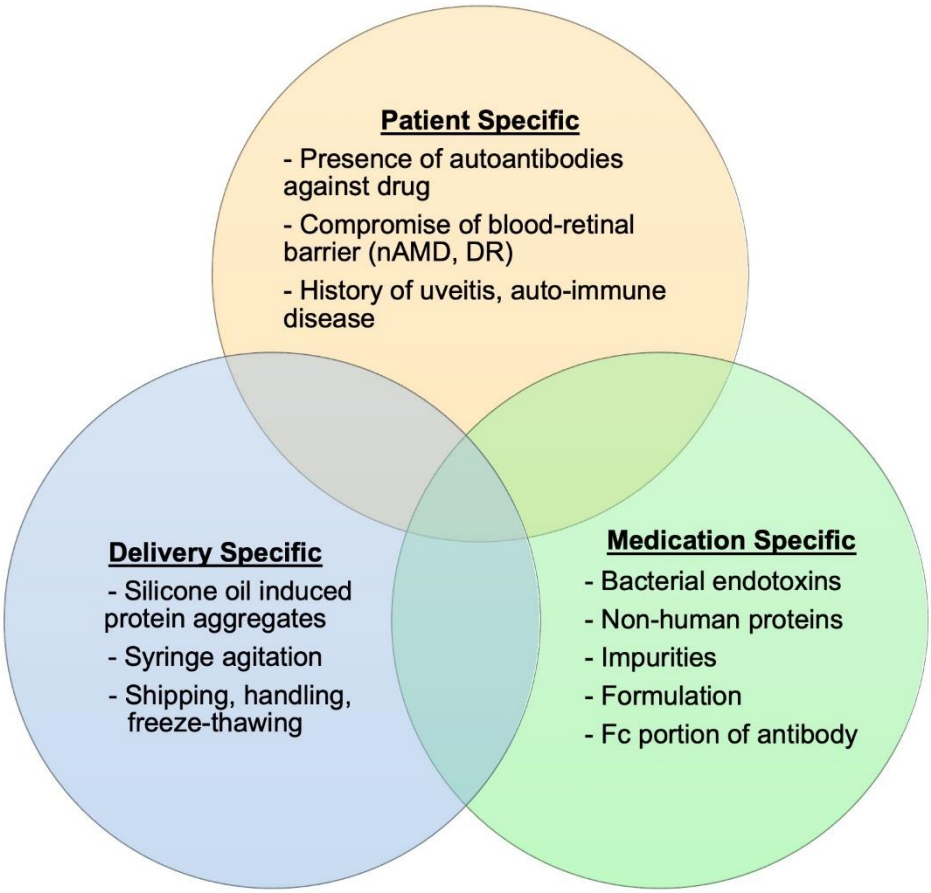
Literature review on the mechanisms of sterile inflammation after intravitreal injection of different antiangiogenic agents.

Results:

Two types of inflammation are seen with intravitreal injections, acute onset sterile inflammation and delayed onset inflammatory vasculitis. Acute onset inflammation can be subcategorized into subclinical anterior chamber inflammation and sterile uveitis/endophthalmitis. Subclinical anterior chamber inflammation can occur at rates as high as 19% after intravitreal anti-VEGF injection. Rates of sterile uveitis/endophthalmitis range from 0.05% to 4.4% depending on the anti-VEGF agent. Inflammatory vasculitis is only associated with brolucizumab. In addition, silicone oil from syringes can induce immunogenic protein aggregates. Agitation of the syringe, freeze thawing, shipping and improper storage may increase the amount of silicone oil.

Conclusions:

Inflammation might be patient-specific, medication-specific and delivery-specific. The majority of clinically significant inflammation seen after intravitreal injection is an acute onset inflammatory response. Avoiding temperature fluctuation, mechanical shock, agitation during transport and handling, and the use of silicone oil-free syringes may help minimize intraocular inflammation.


Patient Specific
- Presence of autoantibodies against drug
- Compromise of blood-retinal barrier (nAMD, DR)
- History of uveitis, auto-immune disease
Delivery Specific
- Silicone oil induced protein aggregates
- Syringe agitation
- Shipping, handling, freeze-thawing
Medication Specific
- Bacterial endotoxins
- Non-human proteins
- Impurities
- Formulation
- Fc portion of antibody

Abstract 79

REPEATABILITY OF READING PERFORMANCE MEASURES IN PATIENTS WITH NEOVASCULAR AGE-RELATED MACULAR DEGENERATION AND GOOD VISUAL ACUITY

Oral

Ricardi F.*[1], Boscia G.[1], Gelormini F.[1], Marica V.[1], Conte F.[1], Borrelli E.[2], Reibaldi M.[1]

[1]University of Turin ~ Turin ~ Italy, [2]Università Vita-Salute San Raffaele ~ Milan ~ Italy

Purpose:

The aim of this study was to assess the inter-session repeatability of reading performance measures in patients with previously treated neovascular age-related macular degeneration (AMD) and good BCVA (≥ 20/40 Snellen) and to investigate the relation between BCVA and reading parameters in patients on treatment for neovascular AMD

Methods:

Ninety-one patients (91 eyes) with a diagnosis of previously treated neovascular AMD and good BCVA (≥ 20/40 Snellen) were enrolled. Reading performance metrics were assessed using Radner charts. To test repeatability, we calculated the intraclass correlation coefficient (ICC), the 95% coefficient of repeatability (CR) and the coefficient of variation (CV) for each reading parameter: (i) reading acuity (RA-LogRAD); (ii) maximal reading speed (max RS-words per minute); (iii) reading acuity score (RA score-LogRAD); and (iv) critical print size (CPS-LogRAD). The results of the linear regression analysis of BCVA and reading performance were reported graphically as scatter plots.

Results:

Mean±SD BCVA was 0.129±0.0098 LogMAR [range: 0.00-0.30 LogMAR]. The ICC values indicated a good reliability for all the analyzed metrics (0.901 for RA; 0.859 for max RS; 0.906 for RA score; and 0.868 for CPS). The CR was 0.2 LogRAD for RA, 63.2 words per minute for max RS, 0.2 LogRAD for RA score, and 0.2 LogRAD for CPS. CV was 5.5% for RA, 8.9% for max RS, 5.8% for RA score and 6.9% for CPS. In the univariate analysis, a statistically significant relationship was found between the BCVA and RA , RA score, max RS and CPS.

Conclusions:

Reading performance metrics are characterized by good values of inter-session repeatability in neovascular AMD patients with good BCVA. Our findings may grant the employment of such measures in trials assessing the visual outcome in these patients.

Abstract 29

REAL-TIME DIAGNOSIS OF DIABETIC RETINOPATHY BY A HANDHELD RETINAL CAMERA, ARTIFICIAL INTELLIGENCE AND SIMULTANEOUS SPECIALIST CONFIRMATION: CLOSING THE GAP

Oral

Melo G.*[1], Cardoso V.[2], Chagas T.[3], Malerbi F.[1]

[1]Federal University of São Paulo ~ São Paulo ~ Brazil, [2]Hospital de Olhos de Sergipe ~ Aracaju ~ Brazil, [3]IOCM ~ Aracaju ~ Brazil

Purpose:

To report on the clinical use of a portable handheld retinal camera with an embedded artificial intelligence (AI) platform, and an instantaneous notification system for the screening of diabetic retinopathy (DR) in an underserved rural area.

Methods:

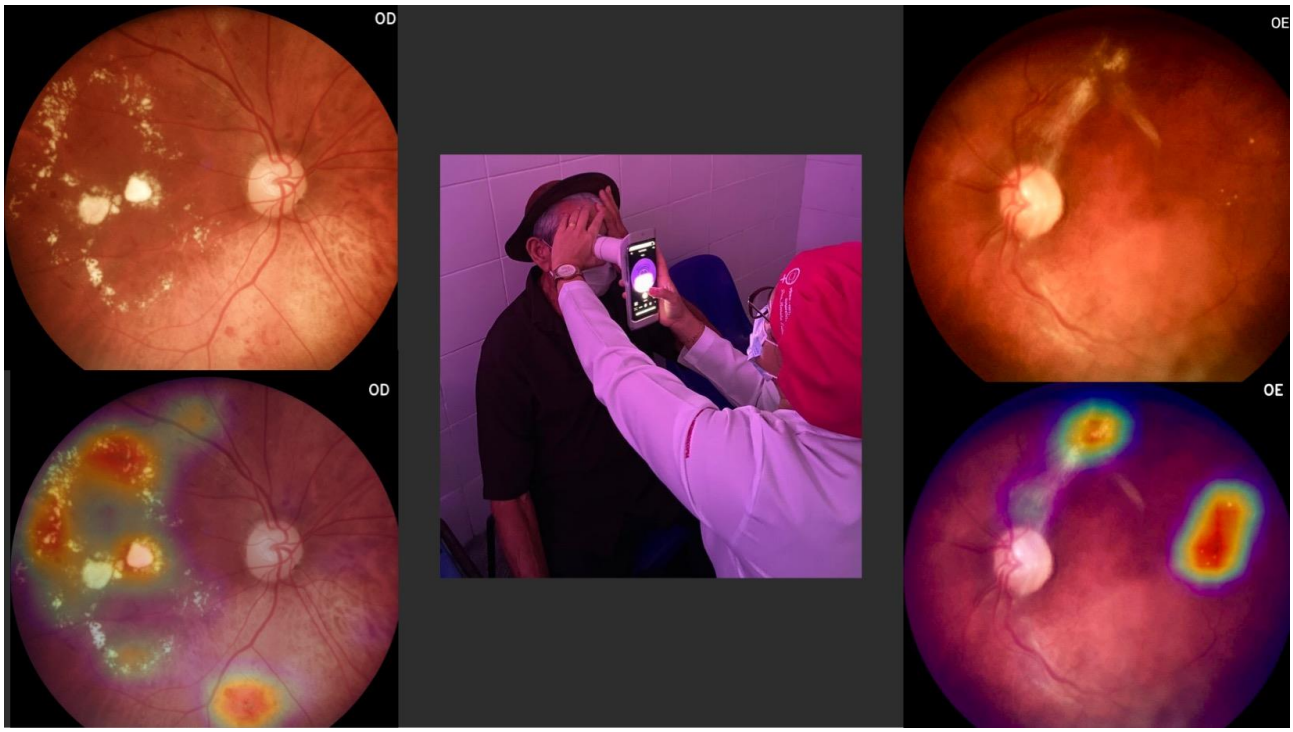
740 diabetic individuals (total diabetic population of the city) were invited by various advertising strategies. A handheld retinal camera, with its embedded AI system designed to detect retinal changes, was used. Immediate and automatic push notifications were remotely sent to retina specialists whenever significant abnormal findings were detected by AI. Physicians would classify images as referable or non-referable in real time. Referral criteria were more than mild DR, glaucoma or cataract suspects, and those with poor image quality. All altered exams were later reviewed to check for false negatives. All referred patients were scheduled for complete ophthalmic work-up and treatment.

Results:

A total of 400 patients were screened, accounting for 54% of the known diabetic population. The AI screening indicated that 111 individuals met the referral criteria: 57 with more than mild DR or poor-quality images, 45 with suspected cataract and 5 with suspected glaucoma. All altered exams were checked by a retina specialist in real time, and the subject was informed instantaneously by the technician after remote physician feedback. Retina specialist review confirmed there were no false negatives. After further analysis, 30 out of 57 referred were sent for treatment of any form of DR.

Conclusions:

This technology, using AI validated in real-time by telemedicine, was effective in screening for DR in an underserved area with an enormous gap in ophthalmological care. Only one fourth of the individuals were referred for review, thus saving time for the patient and the physicians.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Abstract 173

DIAGNOSIS OF ALZHEIMER'S DISEASE USING OPTICAL COHERENCE TOMOGRAPHY ANGIOGRAPHY AND MACHINE LEARNING

Poster

Yoon J.M.*[1], Lim C.Y.[2], Noh H.[1], Nam S.W.[1], Kim K.[3], Ham D.[1]

[1]Department of Ophthalmology, Samsung Medical Center, Sungkyunkwan University School of Medicine ~ Seoul ~ Korea, Republic of, [2]Department of Medical Device Management and Research, SAIHST, Sungkyunkwan University ~ Seoul ~ Korea, Republic of, [3]Department of Data Convergence and Future Medicine, Sungkyunkwan University School of Medicine, Medical AI Research Center, Samsung Medical Center ~ Seoul ~ Korea, Republic of

Purpose:

To investigate the diagnostic ability of the foveal avascular zone (FAZ) in Alzheimer's disease using optical coherence tomography angiography (OCTA) and machine learning.

Methods:

This prospective cross-sectional study included 20 patients with Alzheimer's disease and 35 subjects with normal cognitive function (control). All subjects were confirmed by amyloid positron emission tomography and underwent OCTA. The FAZ was automatically segmented using artificial intelligence from each OCTA image of the superficial capillary plexus. Multiple features (area, convexity, roundness, solidity, eccentricity, compactness, elongation, and convexity defect) of FAZ were extracted and used for training of the classification algorithm based on gradient boosting with 5-fold cross validation. The diagnostic ability of Alzheimer's disease was assessed by the area under the receiver operating characteristic curve (AUC).

Results:

Among multiple features of FAZ, area, roundness, solidity, eccentricity, and compactness were effective in the diagnosis of Alzheimer's disease. In the classification only using FAZ area, AUC was 0.63 ± 0.05. When all effective features were used in the classification, the AUC increased to 0.71 ± 0.05.

Conclusions:

Multiple FAZ features extracted by machine learning showed the diagnostic ability of Alzheimer's disease. The FAZ can be considered as a potential biomarker of Alzheimer's disease.

Abstract 176

MICROPULSE SUBTHRESHOLD YELLOW LASER IN TREATMENT OF CENTRAL MACULAR EDEMA IN CENTRAL SEROUS CHORIORETINOPATHY

Oral

Brzakovic M.*, Zlatanovic M., Živkovic M., Hristov A., Zlatanovic N.

Eye Hospital Klinika Maja ~ Niš ~ Serbia

Purpose:

One of the major causes od CME is disruption of the blood–retinal barrier. Subthreshold micropulse yellow laser (SMYL) has widespread benefits for the treatment of different macular disorders, inculding CME without foveal damage. We report a series of cases of CME that were completely resolved with the SMYL treatment.

Methods:

The results of 10 eyes with central serous chorioretinopathy (CSHR) treated with yellow laser micropulse laser photocoagulation are presented. CSHR was diagnosed in all eyes at the first examination, confirmed by fluorescein angiography (FA) and OCT maculae. Laser intervention was performed according to the results of FA. The results were measured according to visual acuity (Snellen tables), the central thickness of the macula was monitored by OCT maculae and at the last control a FA was performed. Results from the first visit, 15 and 30 days after the intervention were compared. The results are presented using the Microsoft Excel program.

Results:

The results obtained indicate a complete cure of CME caused by CSHR by SMPL performed according to FA. According to the last FA report, there was a complete regression of CME, which is confirmed by the central thickness of the macula reduced by an average of 42% and the visual acuity improved by at least 3 lines and reaches 1.0 in all cases. A greater effect of the intervention was seen at the first control, while complete regression occurred at the second control, 30 days after the intervention.

Conclusions:

Based on the presented results, it is concluded that subthreshold micropulse yellow laser intervention is a reliable method of treating CME caused by CSHR. OCT results of the macula and visual acuity indicate a complete regression of the disease within 30 days of the intervention.

Abstract 214

TRATTAMENTO DELLA CORIORETINOPATIA SIEROSA CENTRALE CON INDOMETACINA PO E COLLIRIO.

Oral

Marolda P.*, Fiormonte F.

Università Campus Bio-Medico ~ Roma ~ Italy

Purpose:

Descriviamo il follow-up di due pazienti affetti da corioretinopatia sierosa centrale ai quali è stata sottoposta una terapia di seconda linea con indometacina sistemica e collirio.

Methods:

Due pazienti, femmina di 36 anni e maschio di 39, si presentano presso il nostro centro con una storia di CRSC cronica (6 e 9 mesi) non risolutasi nè dopo un periodo di osservazione nè dopo vari trattamenti presso altri centri con acetazolamide, cortisonici ed alcuni FANS. La diagnosi viene confermata attraverso l'utlizzo di SD-OCT; nessuna altra complicanza oftalmologica viene evidenziata.
Viene iniziato il trattamento con indometacina po 25 mg 3 volte/die e indometacina collirio 5 mg/ml 4 volte/die.

Results:

A 3 mesi dall'inizio del nuovo trattamento entrambi i casi si sono favorevolmente risolti come evidenziato da scansioni SD-OCT.

Conclusions:

L'associazione di Indometacina assunto sia per via sistemica che locale potrebbe, se supportato da ulteriori evidenze scientifiche, rappresentare una valida opzione terapeutica sia come prima linea che nei casi di CRSC che non vanno incontro nè a spontanea risoluzione nè ad altri trattamenti.

Abstract 46

RETINAL THICKNESS DEVIATION: A NEW OCT PARAMETER FOR ASSESSING DIABETIC MACULAR EDEMA

Oral

Marolo P.*[1], Reibaldi M.[1], Boscia G.[1], Gelormini F.[1], Ricardi F.[1], Ghilardi A.[1], Parisi G.[1], Fallico M.[2], Barresi C.[3], Lari G.[3], Bandello F.[3], Borrelli E.[3]

[1]Department of Ophthalmology, University of Turin, Italy ~ Turin ~ Italy, [2]Department of Ophthalmology, University of Catania, Italy ~ Catania ~ Italy, [3]Vita-Salute San Raffaele University, Milan, Italy. ~ Milan ~ Italy

Purpose:

To determine associations between visual acuity (VA) and a new parameter, the retinal thickness deviation (RTD) from normative age-adapted retinal thickness data, in diabetic macular edema (DME) eyes treated with intravitreal anti-vascular endothelial growth factor (VEGF) or corticosteroid therapy.

Methods:

In this retrospective study, eighty-one patients (104 eyes) with center-involved DME undergoing intravitreal anti-VEGF or corticosteroid therapy with two years of follow-up imaging data were included.
Linear and nonlinear regression analyses with curve fitting estimation were performed to explore the relationship between VA and optical coherence tomography (OCT)-based parameters at 12 and 24-month follow-up visits. RTD was calculated as the absolute value of the difference between measured and normative retinal thickness values.

Results:

The VA had a statistically significant linear association with central subfield thickness (CST) at 12 months (R2=0.077 and p=0.004), while this association was not statistically significant at 24 months (R2=0.036 and p=0.053). Compared with linear models, the quadratic function provided the best fit between VA and CST at 24-months (R2=0.144 and p<0.001). Conversely, the linear function was the best fitting for VA and RTD both at 12 and 24-month follow-up visit (R2=0.158 and p<0.001, R2=0.212 and p<0.001, respectively).

Conclusions:

In DME eyes undergoing intravitreal treatment, deviation values from normative retinal thickness data better correlate with VA than CST, with a greater linear association. This suggest RTD as a good surrogate for VA, being able to interpret retinal thickness changes above but also below normal thickness values.

Abstract 78

EVALUATION OF THE ADDITIVE EFFECT OF INTERFERON A 2B WITH MONTHLY INTRAVITREAL INJECTION OF BEVACIZUMAB IN REFRACTORY DIABETIC MACULAR EDEMA

Oral

Riazi Esfahani H.*[1], Faghihi H.[1], Gharehbaghi G.[2], Inanloo B.[1], Khalili Pour E.[1], Mirzaee A.[1]

[1]Farabi Eye Hospital, Tehran University Of Medical Sciences ~ Tehran ~ Iran, Islamic Republic of, [2]Iran university of medical sciences ~ Tehran ~ Iran, Islamic Republic of

Purpose:

To evaluate the additive effect of topical or sub-tenon injection of interferon (IFN) -α 2b in the treatment of refractory diabetic macular edema.

Methods:

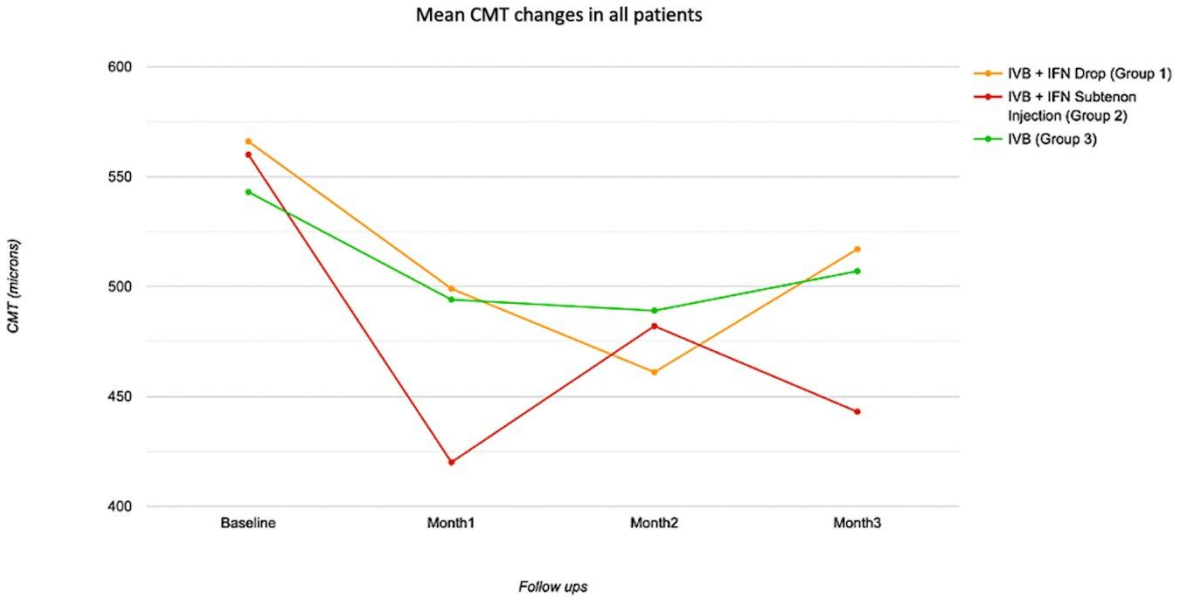
In this prospective study, 59 eyes of 35 patients with refractory center-involved DME who were unresponsive to three monthly consecutive IVB injections were recruited. Patients were divided into three groups: group1, received IFN- α 2b topical drop at a dose of 1mIU/ml four times a day for three months. Group 2, received a single sub-tenon injection of 1mIU/ml IFN- α 2b at the enrollment. Group 3 received artificial tears four times a day for three months (control group). All groups received three consecutive monthly IVB injections and were evaluated monthly up to one month following the last IVB injection.

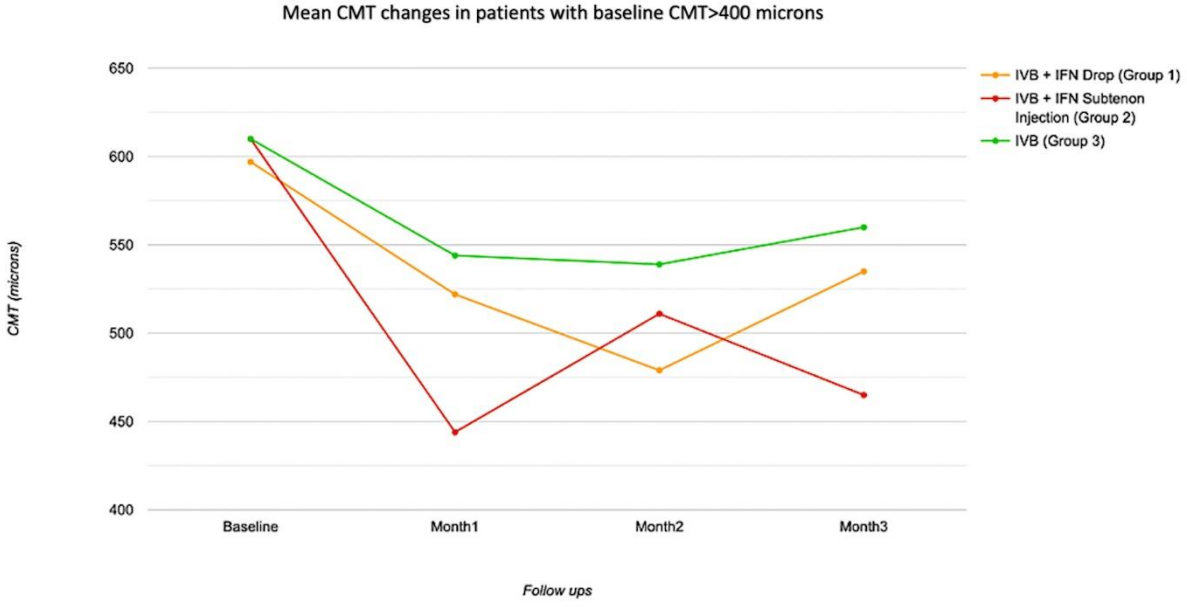
Results:

The final follow-up showed that although CMT decreased in all groups, only patients in Group 2 had statistically significant lower CMT (p-value=0.025). Comparison of CMT changes between three groups showed no significant difference, although it was higher in group 2. Considering patients with baseline CMT > 400 µm, subtenon iIFN α2b led to a significant reduction of CMT at the first month and final follow-up visit (p-value= 0.018 and 0.035, respectively). Alterations of CDVA were not significant among groups, although Group 1 patients had a significant visual improvement at second and last follow up (p-value= 0.030 and 0.010, respectively).

Conclusions:

Subtenon injection of IFN might have an additive anatomical effect in patients with refractory DME. Validation of this observation requires further prospective controlled studies.


Mean CMT changes in all patients
600
550
500
450
400
CMT (microns)
Baseline
Month1
Month2
Month3
Follow ups
IVB + IFN Drop (Group 1)
IVB + IFN Subtenon Injection (Group 2)
IVB (Group 3)


Mean CMT changes in patients with baseline CMT>400 microns
650
600
550
500
450
400
CMT (microns)
Baseline
Month1
Month2
Month3
Follow ups
IVB + IFN Drop (Group 1)
IVB + IFN Subtenon Injection (Group 2)
IVB (Group 3)

Abstract 138

PREOPERATIVE DEXAMETHASONE INTRAVITREAL IMPLANT IN DIABETIC MACULAR EDEMA PATIENTS UNDERGOING PHACOEMULSIFICATION: THE CATADEX STUDY

Oral

Vadalà M.*, Di Blasio R., Sunseri Trapani V., Cillino S., Bonfiglio V.M.E.

Biomedicine, Neuroscience and Advanced Diagnostic Department, University of Palermo ~ Palermo ~ Italy

Purpose:

Cataract surgery in diabetic patients has been reported to increase the levels of pro-inflammation cytokines, enhancing the risk of developing diabetic macular edema (DME). As there is not standardized approach for such patients, this study aimed to assess the impact of preoperative Dex-I on functional and anatomic outcomes.

Methods:

This was a prospective, non-comparative, single-center study, conducted on consecutive DME patients in whom cataract surgery was planned. Dex-I (Ozurdex, Allergan plc., Dublin, Ireland) was administered 15±7 days before cataract surgery and follow up were until month 12 (T12). At all the study visits, each subject underwent a standard ophthalmic examination, OCT evaluation, including central retinal thickness (CRT), central subfield thickness (CST), total macular volume (TMV), and central subfield macular volume (CSV). DME was classified in sponge-like diffuse retinal thickness (SLDRT), cystoid macular edema (CME), and subfoveal neuronal detachment (SND). Retreatment was allowed with a pro re nata (PRN) protocol.

Results:

48 eyes were included; 50% were treatment naive. CRT significantly decreased from 416.9 ± 68.4µm at baseline to 304.9 ± 26.3µm at T12, $p < 0.001$ each. TMV and CSV were significantly reduced from 9.96 ± 1.55mm3 and 0.40 ± 0.10mm3 at baseline to 8.44 ± 0.8mm3 and 0.32 ± 0.05mm3 at T12, ($p<0.001$ each). BCVA (Snellen equivalent) significantly improved from 0.26 ± 0.19 SE at baseline to 0.63 ± 0.23; 0.62 ± 0.22; 0.59 ± 0.21; 0.50 ± 0.21; 0.62 ± 0.19; and 0.66 ± 0.18 at T1, T2, T3, T6, T9, and T12, $p<0.001$ each.

Conclusions:

In this study, we found that Dex-I 15 days before surgery was effective in improving anatomic and functional outcomes in preexisting DME and its worsening after uneventful cataract surgery. Dex-I in peri/pre-operative use is a valuable and safe treatment strategy in such population.

Abstract 963

AURIGA 24-month results from treatment-naïve patients with DME treated with intravitreal aflibercept in Italy

Oral

Parravano M.C.*[1], Carnovale Scalzo G.[2], Erba S.[3], Grassi M.O.[4], Allmeier H.[5], Machewitz T.[6], Molina D.[5], Vadalà M.[7]

[1]Department of Ophthalmology, IRCCS-Fondazione Bietti, Rome, Italy, [2]Department of Ophthalmology, University Magna Græcia of Catanzaro, Catanzaro, Italy, [3]ASST Fatebenefratelli Sacco, Oftalmico Hospital, Milan, Italy, [4]Eye Clinic, University of Bari, Bari, Italy, [5]Bayer Consumer Care AG, Basel, Switzerland, [6]Bayer AG, Berlin, Germany, [7]Biomedicine, Neuroscience and Advanced Diagnostic Department, University of Palermo, Palermo, Italy

Purpose:

AURIGA (NCT03161912) evaluated intravitreal aflibercept (IVT-AFL) treatment of diabetic macular edema (DME) or macular edema secondary to retinal vein occlusion in routine clinical practice. Important insights into IVT-AFL effectiveness and treatment patterns were obtained across 11 countries. Here, we report the 24-month outcomes for treatment-naïve patients with DME in Italy.

Methods:

AURIGA was a 24-month, prospective, observational study. Eligible patients (aged ≥18 years) with treatment-naïve DME were treated with IVT-AFL for up to 24 months at their physician's discretion and according to local regulations. The primary endpoint was change in visual acuity (VA; Early Treatment Diabetic Retinopathy Study [ETDRS] letters) from baseline to Month (M) 12. Secondary endpoints included change in VA by M24, change in central retinal
thickness (CRT) by M12 and M24, and number of IVT-AFL injections by M6, M12, and M24. Statistics were descriptive and no formal hypothesis testing was planned. Safety was monitored throughout the study.

Results:

In 207 patients (mean age, 65.6 years), mean (95% CI) VA improved by +6.3 (3.4, 9.1) letters at M12 and +5.0 (1.8, 8.2) letters at M24 from baseline. Stratified by baseline VA of <35 letters, 35–69 letters, and ≥70 letters, mean VA gains by M24 were +30.5, +2.6, and −1.7 letters, respectively. From baseline, mean±SD CRT decreased by 105±139 µm at M12 and 115±151 µm at M24. Mean±SD number of IVT-AFL injections was 4.1±1.4 by M6, 5.0±2.0 by M12, and 5.6±2.7 by M24. No cases of retinal vasculitis, retinal vascular occlusion, or intraocular inflammation, including endophthalmitis, were reported.

Conclusions:

AURIGA was the largest real-world study to date investigating IVT-AFL treatment of DME. In Italy, treatment-naïve patients achieved clinically relevant and durable improvements after 24 months of treatment, particularly patients with lower baseline VA. The safety profile of IVT-AFL was consistent with that observed in previous studies.

Abstract 170

CONFOCAL MULTICOLOR SIGNAL DEPENDS ON PERFUSION CHARACTERISTICS OF RETINAL MICROANEURYSMS IN DIABETIC RETINOPATHY AS DETECTED BY OCTA

Oral

Berni A.*, Arrigo A., Bianco L., Antropoli A., Saladino A., Gambarotta S., Battaglia Parodi M., Bandello F.

IRCCS San Raffaele ~ Milan ~ Italy

Purpose:

To propose a non-invasive multimodal imaging categorization of retinal microaneurysms (MA) secondary to diabetic retinopathy

Methods:

The study was designed as cross-sectional, observational, including patients affected by diabetic retinopathy (DR). Multimodal imaging included confocal MultiColor, blue autofluorescence (BAF), optical coherence tomography (OCT) and OCT angiography (OCTA) images. MA green- and red-reflectance components were assessed by confocal MultiColor, reflectivity properties by OCT, and MA perfusion features by OCTA. In addition, we included high-resolution (HR) and high-speed (HS) OCTA scans to assess HR-HS agreement in detecting retinal MA and to highlight different perfusion features detected by both OCTA acquisitions.

Results:

We analyzed 216 retinal MA, categorized as green (46; 21%), red (58; 27%) and mixed type (112; 52%). Green MA were mainly hyperreflective on OCT, with no or poor filling on OCTA. Red MA were characterized by isoreflective signal on OCT and full filling on OCTA. Mixed MA showed hyperreflective border and hyporeflective core on OCT and partial filling on OCTA. MA HR/HS size discrepancy highlighted no differences in size and reflectivity when considering red MA, whereas it progressively increased as MA changed from red to green MultiColor signal. MA types significantly correlated with visual acuity, DR duration and severity

Conclusions:

Retinal MA can be reliably classified by means of a fully non-invasive multimodal imaging-based assessment. MA types are related with visual acuity, DR duration and DR severity. Both HR and HS OCTA are highly feasible in detecting MA, although HR OCTA should be preferred when fibrotic evolution goes on.

Abstract 114

DIABETIC RETINOPATHY SCREENING: DATA FROM A NEW CENTRE

Oral

Spinetta R.*, Malinverni L., Moglia T., Bellan B., Orsi R.

Ospedale Oftalmico, ASL Città Di Torino ~ Torino ~ Italy

Purpose:

to introduce the new screening programme adopted by ASL Città di Torino. To highlight the prevalence and the severity of diabetic retinopathy (DR) in the diabetic population living in Torino. To relate systemic factors and the time since last ophtalmology visit to DR severity.

Methods:

observational study carried out at the new ophtalmologist centre for screening and treatment of DR in Ospedale Oftalmico di Torino since September 2021. The study was conducted in collaboration with the Diabetology Service. Systemic and anamnestic data were collected by the program Smart Digital Clinic used by diabetologists. Records about previous eye visits and treatments were collected .
During eye examination patients underwent slit lamp anterior and posterior examination, BCVA evaluation (LogMar), OCT evaluation (Heidelberg Spectralis OCT).
We assessed demographic and prevalence data, severity grading by ETDRS (Early Treatment Diabetic Retinopathy Study) classification and its correlation with systemic factors, treatments prescribed.

Results:

277 patients were enrolled,15.52% affected by DM type 1.
The mean DM duration was 15,7 (±11,33) years, 2.5(±1.92) the years from the last eye visit, 51,99% the prevalence of related systemic comorbidities (25,27% hypertension, 19,86% coronary artery disease, 9,03% chronic renal insufficiency). At presentation BCVA was 0.15(±0.5)LogMar, 2.17% patients showed new vessels,1.08% hemorragic vitreous,6.5% epiretinal membrane; 35,38% cataract; 3,25% had positive history for previous antiVEGF injections,1,08% for Dexhametasone injection.
Study population showed: 41,52% no sign of DR, 26.35% mild DR, 13% moderate, 2,17% severe, 4.33% proliferative DR, 15.52% diabetic maculopathy ; 4.69% patients received antiVEGF injections,1.44% Dexhametasone injection,4.69% laser treatment.

Conclusions:

to improve screening uptake a strict collaboration with diabetologists is demanded. The employment of computer programs shared with other specialists helps a whole management of diabetic patients. A DR screening eye program allows to detect other eye diseases related to the diabetes which can be treated earlier with better outcomes.

Abstract 110

RETINAL NON-PERFUSION AREA MEASURED WITH WIDEFIELD OCT-ANGIOGRAPHY IN DIABETIC RETINOPATHY WITH OR WITHOUT NEOVASCULARIZATION

Oral

Hugo L.B., Ramin T., Alain G., Aude C.*

University Paris Cite ~ Paris ~ France

Purpose:

To compare retinal non-perfusion areas using widefield optical coherence tomography-Angiography (OCT-A) in eyes with diabetic retinopathy (DR) with or without neovascularization.

Methods:

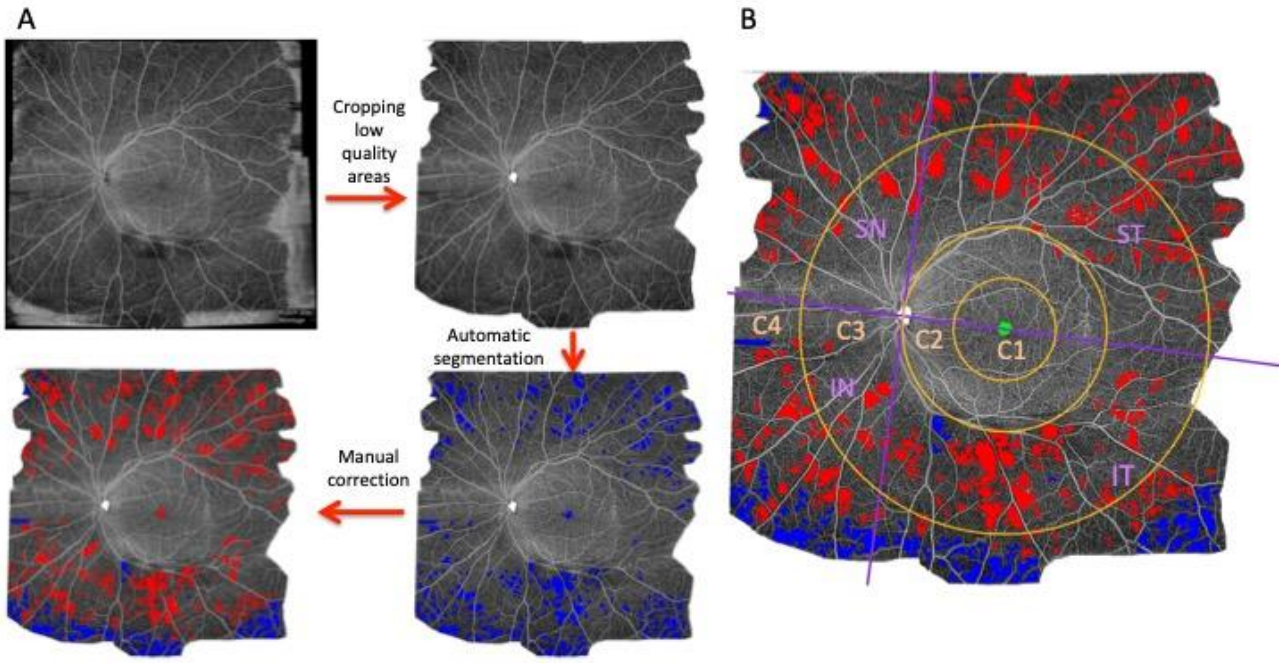
We conducted an observational case series in a tertiary ophthalmology centre. Treatment-naïve eyes with severe non-proliferative DR (NPDR) and proliferative DR (PDR) were consecutively included. An OCT-A photomontage(five 12 mm x 12 mm images)was obtained i all patients. Non-perfusion areas (NPA) were measured using a semi-automatic approach based on a first step of automatic segmentation, relying on spatial variance map analysis, followed by a second step of manual correction. We then compared NPA in eyes with severe NPDR vs PDR. The location of NPA and its correlation to the presence of local neovascularization were also assessed in the different sectors.

Results:

A total of 51 eyes of 30 patients (27 with severe NPDR and 24 eyes with PDR) were included. The mean NPA was significantly higher in PDR compared with severe NPDR (18.94% vs 7.51%, $p < 0.01$). Using NPA in the whole image as a tool to detect PDR, the ROC-curve AUC was 0.77 (optimal cutoff of 12.69%, sensitivity = 0.625, specificity = 0.889). The AUC increased when using NPA in the most peripheral circle (0.792). The presence of local neovascularization in a sector was associated with a higher NPA in the same sector (29.2% vs 6%, $p < 10\text{-}15$).

Conclusions:

Using a semi-automatic approach, we showed that the NPA percentage on WF OCT-A photomontage was significantly higher in eyes with PDR compared to eyes with severe NPDR. This approach shows intermediate diagnostic performances to predict PDR status, possibly because of ischemia located outside the OCT-A image field.


A
Cropping low quality areas
Automatic segmentation
Manual correction
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C4
C3
C2
C1
IN
IT

Abstract 218

THE ASSOCIATION OF ADIPOQ GENE POLYMORPHISMS DIABETIC RETINOPATHY IN GREEK PATIENTS.

Poster

Gouliopoulos N.[1], Bouratzis N.*[2], Siasos G.[3], Oikonomou E.[3], Kollia C.[3], Konsola T.[3], Oikonomou D.[1], Rouvas A.[1], Kassi E.[4], Tousoulis D.[3], Moschos M.[5]

[1]2nd Department of Ophthalmology, University of Athens Medical School, Attikon Hospital, Athens, Greece ~ Athens ~ Greece, [2]Specialized Eye Hospital Ophthalmiatreion Athinon ~ Athens ~ Greece, [3]1st Department of Cardiology, University of Athens Medical School, Hippokration Hospital, Athens, Greece ~ Athens ~ Greece, [4]1st Department of Propaedeutic and Internal Medicine, Division of Diabetes, University of Athens Medical School, Laiko Hospital, Athens, Greece ~ Athens ~ Greece, [5]1st Department of Ophthalmology, University of Athens Medical School, G. Gennimatas Hospital, Athens, Greece ~ Athens ~ Greece

Purpose:

To examine whether ADIPOQ rs1501299 and rs2241766 gene polymorphisms are associated with diabetic retinopathy (DR) in a cohort of Greek diabetic patients

Methods:

In our study 218 patients with type-2 diabetes mellitus (T2DM) were included. A complete ophthalmological examination was performed to every participant in the study; 109 were identified as DR patients and 109 as non-DR. Clinical and demographic data were also assessed, while the patients were genotyped for G276T (rs1501299) and T45G (rs2241766) single nucleotide polymorphisms of ADIPOQ gene.

Results:

No significant differences were detected regarding the demographic and clinical data between the studied groups, except for HbA1c levels and frequency of insulin treatment (higher in DR patients). The frequency of rs1501299 GT genotype was significantly higher in DR patients (53% vs. 34%, p=0.004) and was associated with a higher risk for developing retinopathy (OR 2.31, 95% CI 1.30-4.11). Furthermore, the rs1501299 GT genotype was significantly and independently associated with increased odds for DR development in diabetic patients (OR 2.68, 95% CI 1.38–5.21, p = 0.004), regardless of the impact of other known risk factors.

Conclusions:

We identified rs1501299 GT genotype as a potent and independent risk factor of retinopathy in T2DM Greek patients, while no role for rs2241766 polymorphism was recognized.

Abstract 100

BILATERAL MACULAR RETINITIS

Oral

Mekkawy M.*

Al Mashreq Eye Center ~ Cairo ~ Egypt

Purpose:

To present a series of cases with bilateral macular retinitis in patients with presumed rift valley fever from Sudan.

Methods:

Retrospective case series of 3 patients travelling from Sudan with post-febrile retinitis, and with a history and clinical picture suggestive of RVF retinitis.

Results:

The three patients were adult males with underlying medical conditions and underwent fundus fluorescein angiography that confirmed bilateral retinitis and occlusive vasculitis involving the posterior pole. Optical coherence tomography showed distortion of the macular layers. Case 2 presented 1 month following febrile illness and had retinal thinning, with optical coherence tomography angiography showing marked reduction in vessel density.

Conclusions:

We present multimodal imaging data of three cases with presumed RVF retinitis from a recent outbreak in Sudan. The unavailability of standardized methods of testing for RVF, as is the case for most epidemic retinitis-causing pathogens, makes the diagnosis challenging.

Abstract 117

A PREMACULAR HEMORRHAGE WITH ROTH SPOTS REVEALING A SYSTEMIC LUPUS ERYTHEMATOSUS

Poster

Sinda B.*[1], Takwa S.[1], Wafa S.[2], Jaafer A.[1], Raja A.[2], Walid Z.[1]

[1]Mohamed Taher maamouri Hospital, department of ophthalmology ~ Nabeul ~ Tunisia, [2]Mohamed Taher Maamouri Hospital, medecine department ~ Nabeul ~ Tunisia

Purpose:

Systemic lupus erythematosus (LES) is an auto-immune disease that affects a variety of organs mainly through inflammatory mechanisms. SLE-related ocular manifestations can be diagnosed in 7 to 26% of the patients, it indicates systemic disease activity and can rarely reveal the disease.

Methods:

We report the case of a 25-year-old patient, without medical history, who presented a premacular hemorrhage leading to the diagnosis of a LES

Results:

We report the case of a 25-year-old patient, without medical history,who was hospitalized in the medicine department for pancytopenia.The patient presented an acute painless visual loss of her right eye after forceful vomiting.On ophthalmological examination,the best corrected visual acuity(BCVA) was20/200 in the right eye and20/20 in the left eye.Fundus examination(FE) showed a right premacular hemorrhage associated with bilateral Roth spots and cotton-wool spots.Hemorrhagic detachment of the internal limiting membrane with a fluid level was seen on OCT.An oriented work-up established the diagnosis of LES.After a two-week high-dose course of oral corticosteroids,BCVA had improved and FE showed a restitution ad integrum.

Conclusions:

It’s the first case of LES revealed by a unilateral premacular hemorrhage and bilateral Roth spots associated with a pancytopenia. These manifestations are reversible with corticosteroids.

Abstract 209

SAFETY OF INTRAVENOUS METHYLPREDNISOLONE IN REFRACTORY AND SEVERE PEDIATRIC UVEITIS

Oral

Sendino Tenorio I.*[1], Ghoraba H.[2], Matsumiya W.[2], Khojasteh H.[2], Akhavanrezayat A.[2], Karaca I.[2], Or C.[2], Yavari N.[2], Lajevardi S.[2], Hwang J.[2], Yasar C.[2], Plaza Laguardia C.[1], Do D.[2], Dong Nguyen Q.[2]

[1]Complejo Asistencial Universitario de Leon ~ Leon ~ Spain, [2]Spencer Center for Vision Research, Byers Eye Institute, Stanford University ~ Palo Alto ~ United States of America

Purpose:

To evaluate the safety of intravenous high-dose pulse methylprednisolone succinate (IVHDM) in the management of severe or refractory non-infectious pediatric uveitis.

Methods:

We reviewed all uveitis patients who were ≤16 years of age and who received IVHDM with a dose of ≥500 mg per day (1–3 days a month) for at least 3 months during their management at a tertiary care eye hospital.

Results:

Twenty pediatric patients with severe or refractory uveitis who received IVHDM were identified. Six patients were excluded, the remaining 14 patients received IVHDM for at least 4 months. Age (mean±SD) was 11.9±2.4 years and 50% were female. Duration of treatment was 14.2±7.5 months. Thirteen patients received IVHDM in combination with other immunomodulatory therapy. Except for two outliers, IVHDM was given at a dose of 8–25 mg/kg per infusion. Three major adverse events (AEs) occurred in two patients and the number of AEs (major and minor) strongly correlated with duration of treatment (p=0.004) and moderately correlated with the cumulative dose/weight (p=0.051).

Conclusions:

IVHDM may be a valid therapeutic option for aggressive/refractory pediatric uveitis. The reported AEs in this series can also be attributed to the concurrent IMT or the underlying disease itself.

Abstract 129

INTRAOCULAR TUBERCULOSIS: A CHALLENGING CASE MIMICKING WET AGE-RELATED MACULAR DEGENERATION

Oral

Interlandi E.*[1], De Marco R.[1], De Luca M.[1], Pellegrini F.[2], Cirillo P.[1]

[1]Department of Ophthalmology, Ospedale del mare ~ Naples ~ Italy, [2]Department of Ophthalmology, Santo Spirito Hospital ~ Pescara ~ Italy

Purpose:

to describe a challenging case of intraocular tuberculosis (IOTB) with unusual presentation

Methods:

retrospective chart review

Results:

A 72 year-old chinese patient was referred to our clinic for visual loss in OS. He was diagnosed with bilateral exudative AMD 18 months before and treated with three intravitreal injections of bevacizumab OU at another hospital. Fundus was unexplorable because of a white cataract OD and vitritis OS. However, retrospective review of records acquired at first presentation showed a type I CNV with diffuse choroidal thickening. Moreover, a round lesion suggestive of choroidal granuloma was observed OS. Then both tubercolin skin and Quantiferon testing resulted positive and a diagnosis of possible bilateral IOTB was carried out.

Conclusions:

Our case demonstrated that CNV may be a possible, albeit unusual, presentation of IOTB to be fully investigated and ruled-out especially in patients from endemic areas. This unusual presentation should be remembered so as to allow a prompt diagnosis and an adequate anti-tubercolar therapy, that is crucial for visual preservation.

Abstract 150

AUTOMATED QUANTIFICATION OF UVEITIS KERATIC PRECIPITATES BY USE OF SD-OCT

Oral

Aljneibi S.*[4], Ometto G.[1], Montesano G.[1], Zicarelli F.[2], Invernizzi A.[3], Pichi F.[4]

[1]Optometry and visual sciences ~ London ~ United Kingdom, [2]Eye clinic ~ Milan ~ Italy, [3]~ Milan ~ Italy, [4]Eye institute, Cleveland Clinic Abu Dhabi ~ Abu Dhabi ~ United Arab Emirates

Purpose:

In the past 10 years a lot of effort has been put into objectivizing the grading of intraocular inflammation. To create an en face 3-D rendering of uveitis keratic precipitates (KPs) using anterior segment optical coherence tomography (AS-OCT) and correlate them to the SUN grading system.

Methods:

Patients with KPs were imaged at 3 time-points: with active uveitis (T0), when inflammation was clinically improving (T1) and after resolution (T2). A dense high resolution 20° x 10° volume of 81 b-scans focused on the endothelium of the cornea was used to obtain detailed features of the KPs. The cornea boundaries and precipitates were sequentially segmented in all the b-scans of the volume. Segmentation results were used to calculate the volume of precipitates per unit of analyzed area, and to reconstruct a map of precipitates. All image processing were performed using Matlab R2021b software with the Image Processing Toolbox.

Results:

A total of 1620 AS-OCT b scans from 20 eyes were analyzed. The mean volume of the KPs was 0.32 mm3 at T0, and significantly decreased to 0.25 mm3 at T1 and 0.06 mm3 at T2 (both $P < 0.0001$). The mean processing time of the software was 110 seconds for each dense volume of 81 scans. The volume of the KPs was significantly higher in granulomatous infectious uveitis ($P = 0.006$). KPs volume correlated with the clinical SUN grading with a significant increase at each grade of the anterior chamber cells count.

Conclusions:

In this study we developed an automated software that creates an en face rendering of uveitic KPs in less than 2 minutes using AS-OCT. KPs volume significantly correlates with the degree of anterior chamber inflammation, and decreases with inflammation resolution.

Abstract 164

SARCOID UVEITIS: AN INTRIGUING CHALLENGER

Oral

Rissotto R.*[1], Allegri P.[2], Olivari S.[2], Rissotto F.[3]

[1]Eye Clinic, San Paolo Hospital, University of Milan ~ Milan ~ Italy, [2]Uveitis and Eye Inflammatory Diseases Referral Center, Rapallo Hospital ~ Rapallo ~ Italy, [3]Department of Ophthalmology, IRCCS Ospedale San Raffaele, University Vita-Salute San Raffaele ~ Milan ~ Italy

Purpose:

The purpose of our work is to describe the actual knowledge concerning etiopathogenesis, clinical manifestations, diagnostic procedures, complications and therapy of ocular sarcoidosis (OS).

Methods:

The study is based on a recent literature review and on the experience of our tertiary referral center. Data were retrospectively analyzed from the electronic medical records of 235 patients (461 eyes) suffering from a biopsy-proven ocular sarcoidosis.

Results:

Middle-aged females presenting bilateral ocular involvement are mainly affected; eye involvement at onset is present in one-third of subjects. Uveitis subtype presentation ranges widely among different studies: panuveitis and multiple chorioretinal granulomas, retinal vasculitis, intermediate uveitis, vitreitis, anterior uveitis with granulomatous mutton-fat keratic precipitates, iris nodules, and synechiae are the main ocular features. The most important complications are cataract, glaucoma, cystoid macular edema and epiretinal membrane. Therapy is based on the disease localization and severity of systemic or ocular involvement. Local, intravitreal, or systemic steroids are the mainstay of treatment; refractory disease should be treated with conventional and biologic immunosuppressants.

Conclusions:

In conclusion, we summarize the current knowledge and assessment of ophthalmological inflammatory manifestations (mainly uveitis) of OS, which permit an early diagnostic assay and a prompt treatment.

Abstract 61

A CASE OF MEWDS FOLLOWING COVID-19 INFECTION

Poster

Moushmoush O.*[1], Peck T.[2], Venkat A.[2]

[1]MedStar Georgetown University Hospital ~ Washington DC ~ United States of America, [2]Retina Group of Washington ~ Washington DC ~ United States of America

Purpose:

To showcase the OCT and fundus findings of a patient with MEWDS following COVID-19 infection.

Methods:

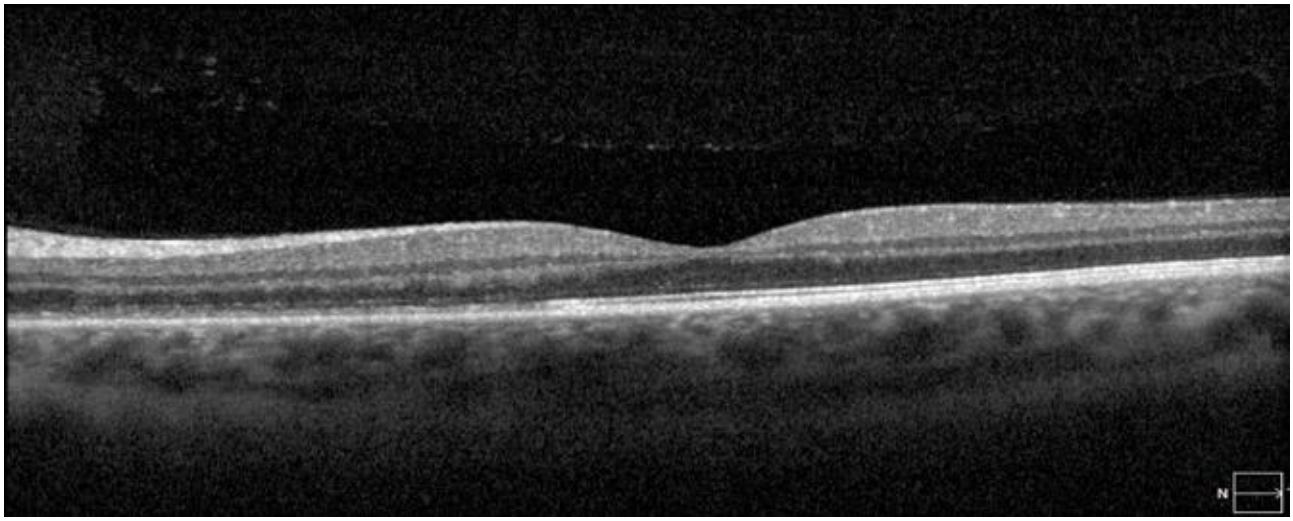
A previously healthy 28-year-old White male patient presented to the retina clinic with a 1-week history of blurred peripheral vision in his left eye. He stated that everything was fuzzy in a specific area of his temporal visual field. Ocular history was remarkable for myopia, and medical history was unremarkable other than COVID-19 infection 2 weeks prior to the onset of his visual symptoms. He reported cough, chills, and myalgias for approximately 4 days while infected.

Results:

On fundoscopy, numerous gray, white, or yellow-white dots can be seen at the level of the outer retina or retinal pigment epithelium, most often in the posterior pole. A mild anterior chamber reaction and vitritis may also be noted in some patients. The etiology remains unclear, and no hereditary predilection has been reported; however, the syndrome most commonly affects healthy women from 15 to 50 years of age. When there is suspicion for MEWDS, multiple imaging modalities can help elucidate the syndrome. OCT demonstrated attenuation of the ellipsoid and interdigitation zones in the nasal macula (Figure 1).

Conclusions:

One-third of patients with MEWDS report a viral prodrome prior to onset of visual symptoms. The pathogenesis of MEWDS may involve an immune response to antigens that have gained access to retinal receptor cells. We report a case of MEWDS following infection with COVID-19 and present imaging findings.



Abstract 27

THE EPIDEMIOLOGY AND RISK FACTORS FOR THE PROGRESSION OF SYMPATHETIC OPHTHALMIA IN THE UNITED STATES: AN IRIS® REGISTRY ANALYSIS

Oral

Douglas V.P.*, Hall N., Ross C., Elze T., Kempen J.H., Miller J., Sobrin L., Lorch A.

Massachusetts Eye and Ear ~ Boston ~ United States of America

Purpose:

To investigate the demographic and clinical characteristics of patients with sympathetic ophthalmia (SO) and define the risk factors for its development following trauma and ophthalmic procedures.

Methods:

This is a retrospective study. Patients in the American Academy of Ophthalmology's IRIS® Registry (Intelligent Research in Sight) diagnosed with SO between January 1st, 2013 and December 31st, 2019 were included (n=2,429). Multiple demographic and clinical factors were collected, descriptive statistics and prevalence were calculated, and multivariate linear regression models were fit to the data. Outcomes were prevalence of SO across geographic areas, demographic and clinical characteristics, and beta coefficient (β) estimates of demographic and clinical characteristics impacting time to SO onset after procedure ('Procedure Only' cohort) or trauma ('Trauma cohort').

Results:

Out of 65,348,409 distinct patients, 2,429 (0.0037%) were diagnosed with SO. Of these, 1,460 (60.11%) were females and 2,106 (86.70%) belonged to the 'Procedure Only' cohort. The prevalence of SO after trauma was 0.04% while after procedures it was 0.02%. The highest prevalence of procedure-related SO was seen in patients with history of multiple procedures (0.0005%) and the lowest was noted with vitreoretinal surgeries (0.0001%). The average time to onset of SO across both cohorts combined was 511.06 (±798.43) days and was shorter with increasing age, by 7.42 (95% CI: -9.88, -4.97) days for every one-year increase.

Conclusions:

SO following trauma and ophthalmic procedure is potentially rarer than previously reported, as measured in this large dataset. Female sex may be a risk factor for SO while older age might be a risk factor for quicker onset. These findings can guide clinical decision-making and management.

Abstract 139

MACULAR HOLE AND RETINAL DETACHMENT IN A PATIENT AFFECTED BY RPE65-RELATED RETINAL DYSTROPHY TREATED WITH SUBRETINAL GENE THERAPY

Poster

Giorgio D.*, Murro V., Mucciolo D.P., Pavese L., Pollazzi L., Sodi A., Virgili G., Giansanti F.

University of Florence ~ Florence ~ Italy

Purpose:

To report the clinical case of a patient affected by RE65-related retinal dystrophy treated with subretinal injection of Voretigene Neparovec (VN) who developed a retinal detachment due to macular hole 21 days after VN gene administration.

Methods:

Case report

Results:

BCVA was 0.92LogMar, fundus examination revealed a pale optic disc, thin vessels and diffuse RPE atrophy in the mid-periphery whereas OCT examination revealed a thin fovea (cft=89 µm). Axial length was 30.28 mm. Twenty-one days after gene therapy, the patient complained about loss of vision in the treated eye. Fundus examination revealed a full thickness macular hole and a retinal detachment. The patient underwent 23g vitrectomy with ILM peeling, inverted ILM flap technique and gas (20% SF6) exchange. At the postoperative follow-up, the macular hole was closed, and the visual acuity improved.

Conclusions:

Inverted ILM flap technique results in closure of the macular hole, flattening of the detachment, with good anatomical and functional results in a patient affected by RPE65-IRD treated with gene therapy.

Abstract 60

INTRAVITREAL DEXAMETHASONE IMPLANT CONCOMITANT TO CATARACT SURGERY IN RETINITIS PIGMENTOSA: POTENTIAL NEUROPROTECTIVE EFFECT.

Poster

Fossataro C.*[1], Savastano M.C.[1], Falsini B.[1], Placidi G.[1], Cestrone V.[1], D"Agostino E.[1], Paris L.[1], Napoli D.[2], Strettoi E.[2], Rizzo S.[1]

[1]Fondazione Policlinico A. Gemelli, IRCCS - Università Cattolica del Sacro Cuore ~ Rome ~ Italy, [2]Istituto di Neuroscienze del CNR ~ Pisa ~ Italy

Purpose:

To evaluate retrospectively retinal morphology and function in retinitis pigmentosa (RP) patients following combined cataract surgery and intravitreal dexamethasone implant (Ozurdex).

Methods:

Macular structure (high resolution OCT) and function (ETDRS acuity) were retrospectively evaluated in a group of typical RP patients six months following combined, uncomplicated, cataract surgery and intravitreal Ozurdex implant (“ozucat” group). The results were compared to those obtained from an age and disease stage-similar group of typical RP patients six months following uncomplicated cataract surgery alone (“cataract” group). Exclusion criteria were: absence of previous macula edema or schisis at pre-surgery stage and good signal in OCT scan (>7/10).

Results:

At six months post-surgery, the “ozucat” group showed an improvement in the median ellipsoid zone length (3%, $p < 0.05$) and ETDRS visual acuity (0.4 Log MAR, $p < 0.05$). Such changes were not observed in the “cataract” group. Compared to the “cataract” group, the “ozucat” group showed a significant increase in the median ellipsoid zone length (Mann Whitney, $p < 0.01$) and a borderline significant increase in the median ETDRS visual acuity ($p < 0.09$).

Conclusions:

These results indicate a higher retinal EZ restoration following combined cataract surgery and intravitreal dexamethasone implant in RP. Further studies would be useful to evaluate the anti-inflammatory and photoreceptor neuroprotective effect of intravitreal dexamethasone implant in RP patients undergoing cataract surgery.

Abstract 127

RETINAL CHANGES AFTER VORETIGENE NEPARVOVEC TREATMENT IN CHILDREN WITH RPE65-RELATED INHERITED RETINAL DYSTROPHY

Oral

Farinaro F.*[1], Di Iorio V.[1], Melillo P.[1], Testa F.[1], Iovino C.[1], Karali M.[2], Rossi S.[1], Della Corte M.[1], Simonelli F.[1], Banfi S.[2]

[1]Eye Clinic, Multidisciplinary Department of Medical, Surgical and Dental Sciences, University of Campania Luigi Vanvitelli, ~ Naples ~ Italy, [2]Medical Genetics, Department of Precision Medicine, University of Campania Luigi Vanvitelli, via Luigi De Crecchio 7, ~ Naples ~ Italy

Purpose:

To report quantitative retinal changes assessed by spectral-domain optical coherence tomography (SD-OCT) in children treated with voretigene neparvovec (VN) at a single center in Italy

Methods:

Retrospective review of six consecutive pediatric patients with biallelic RPE65-related dystrophy treated bilaterally with VN. SD-OCT scans were analyzed to extract ETDRS thickness maps of the whole retina and the outer nuclear layer (ONL). Changes in visual function were assessed by best-corrected visual acuity (BCVA) and retinal morphology at Days 30/45 and 180.

Results:

BCVA significantly improved at Day 30/45 and 6 months (both P < 0.001). Central foveal retinal thickness and central foveal ONL thickness tended to increase (6.4 ± 19.2 µm; P = 0.080 and 3.42 ± 7.68 µm; P = 0.091, respectively). ONL thickness of the internal ETDRS-ring significantly increased at day 30/45 (4.7 ± 8.4 µm; P < 0.001) and day 180 (5.0 ± 5.7 µm; P = 0.009). Intra-operative foveal detachment was not associated with a higher function gain in terms of BCVA, but with a mild thinning of foveal ONL after treatment.

Conclusions:

The improvement of BCVA and thickening of the ONL layer suggest that improvement of visual acuity could be related to partial recovery of retinal morphology in the perifoveal ring.

Abstract 102

LONGITUDINAL STUDY OF DISEASE COURSE IN PATIENTS WITH X-LINKED RETINITIS PIGMENTOSA DUE TO RPGR GENE MUTATIONS

Oral

Iodice C.M.*[1], Di Iorio V.[1], Karali M.[2], Melillo P.[1], Testa F.[1], Banfi S.[2], Simonelli F.[1]

[1]Eye Clinic, Multidisciplinary Department of Medical, Surgical and Dental Sciences, University of Campania Luigi Vanvitelli, Naples, Italy. ~ Naples ~ Italy, [2]Medical Genetics, Department of Precision Medicine, University of Campania Luigi Vanvitelli, via Luigi De Crecchio 7, Naples 80138, Italy. ~ Naples ~ Italy

Purpose:

To investigate the disease course of X-linked Retinitis Pigmentosa (RP) caused by mutations in the RPGR gene.

Methods:

In this retrospective, single-center, longitudinal observational study, we evaluated a cohort of 48 male patients (Mean age: 29.6 ± 15.2 years old) from 31 unrelated families with a diagnosis RPGR-associated RP. At each visit, all patients underwent best-corrected visual acuity (BCVA) assessment and were examined with Goldmann visual field (GVF), optical coherence tomography (OCT), fundus autofluorescence (FAF), microperimetry and full-field electroretinography (ERG).

Results:

We analyzed 48 patients throughout a mean follow-up of 6.5 (±0.7) years. Mean BCVA was 0.6 (±0.7) logMAR, mostly with myopic refraction (79.2%). 30 patients (62.5%) showed pigmentary changes, whereas 18 (37.5%) sine pigmento RP. BCVA declined at a mean rate of 0.025 (±0.012) logMAR/year, primarily driven by GVF loss. 13 patients (27.1%) had macular abnormalities. ERG demonstrated rod-cone dysfunction in half of the cohort. Perimacular hyperautofluorescent ring was found in 24 patients (50%), significantly younger and with higher BCVA compared to those with decreased FAF. Pathogenic variants in exons 1-14 resulted in milder phenotypes compared to ORF15 mutation.

Conclusions:

Males with RPGR gene-associated RP displayed a composite spectrum of disease progression. Milder phenotypes were observed in patients with sine pigmento RP, absence of high myopia and mutations in exons 1-14 of the RPGR gene.

Abstract 183

RETINAL DYSTROPHIES: LANDSCAPE OF GENETIC MUTATIONS IN THE INDIAN SUBCONTINENT

Oral

Bansal M.*

Fortis Memorial Research Institute ~ Delhi NCR ~ India

Purpose:

To describe the genetic mutations affecting individuals with Inherited Retinal Dystrophies (IRDs), at a tertiary care facility in the Indian Subcontinent

Methods:

Patients attending the Ophthalmology Department of tertiary care hospital and diagnosed with IRD underwent detailed eye exam, retinal imaging included fundus photography and optical coherence tomography. The blood samples were sent for genetic sequencing, specifically clinical exome sequencing to determine the causative mutation. A family history and pedigree analysis was done

Results:

Overall 28 patients underwent genetic sequencing. The common mutations found were in the genes USH2A, CERKL and PROM1. Other mutations seen were IMPG2, PDE6A, CHM, CYP4V2, PCARE, SEMA4A, VPS13B, CABP4, LCA5, and EYS genes. Age of presentation ranged from 5 to 45 years, with the average age 28 years.

Conclusions:

Subset of mutations affecting patients from the Indian Subcontinent tend to be very different from those reported in western literature and elsewhere. A high degree of consanguinity in family members increases the chances of development of IRDs with particular subset of mutations been seen more commonly in certain communities

Mutation Type	GENE	MUTATION one	EXON for MUT one
Del	**CERKL**	**c.1045_1046del; (p.Met349ValfsTer20)**	**exon 8**
Transition	PROM1	c.1946C>T; (p.Ser649Leu)	exon 18
Transversion	MERTK	c.2119A>T; (p.Ile707Phe)	exon 16
Transition	**USH2A**	c.4222C>T, (p.Gln1408Ter)	Exon 19
Del	**CERKL**	**c.967_968delAT p.Met323fs**	**exon 8**
Transversion	**CHM**	**c.820 G>C**	**splice acceptor site**
	IFT 140	c.2686G>A (p.Asp896Asn),	Exon 21
Del	**CERKL**	**c.1045_1046del; (p.Met349ValfsTer20),**	**exon 8**
Transversion	**IMPG2**	c.3423T>G (p. Ser1141Arg)	exon 17
Transition	**PROM1**	c.730C>T, (p.Arg244Ter)	exon 8
	PDE6A	**c.769C>T (p.Arg257Ter)**	**Exon 4**
Del	**CDHR1**	1 bp del c.1459del	exon 10
transition	USH2A	c.13576C>T, (p.Arg4526Ter)	Exon 63
Transition	PROM1	c.2373+2T>C	splice site variant intr
Transition	**CHM**	**c.808 C>T**	**exon 6**
Transversion	**CYP4V2**	c.197T>G (p.Met66Arg)	Exon 1
	PCARE	c.1273C>T (p.Arg425Ter)	exon 1
	SEMA4A	c.1466T>C (p.Val489Ala)	exon 12
	USH2A	c.5012G>A (p.Gly1671Asp)	exon 25
	USH2A	c.5012G>A (p.Gly1671Asp)	exon 25
Del	VPS13B	c.(762+1_763-1)_(2824+1_2825-1)del - (exo	exon 7 - 19
Transition	**CYP4V2**	c.1178C>T, p.Pro393Leu,	Exon 9
Del	CABP4	c.800-2_800-1del (3' splice site)	Intron 5
Transition	PROM1	c.1946C>T; (p.Ser649Leu)	exon 18
Transition & Trasve	**IMPG2**	**c.970G>C, (p.Asp324His)**	**exon 10**
Del	LCA5	c.1151del, (p.Pro384GlnfsTer18)	Exon 8
Transition	EYS	c.9083A>G, (p.Asp3028Gly)	Exon 44
Del	**CERKL**	**c.1045_1046del; (p.Met349ValfsTer20)**	**exon 8**

Abstract 167

UNDERSTANDING THE PROPENSITY TO UNDERGO GENETIC TESTING IN PATIENTS AFFECTED BY INHERITED RETINAL DISEASES: A TWELVE-ITEM QUESTIONNAIRE

Oral

Bottazzi L.*, Antropoli A., Bianco L., Arrigo A., Saladino A., Battaglia Parodi M., Bandello F.

Department of Ophthalmology, IRCCS San Raffaele Scientific Institute ~ Milan ~ Italy

Purpose:

The aim of our study is to investigate the propensity of Italian patients affected by IRDs to undergo genetic testing.

Methods:

One hundred and thirty-two patients diagnosed with IRDs referred to Italian Retina Onlus were enrolled from 1st January 2021 to 31th December 2021 in this cross-sectional study to answer to a twelve-item questionnaire.

Results:

One hundred and four patients were aware of the possibility of taking a genetic test, and 94 of them did. Most of genetically tested patients (93.6%) had been informed about advantages and limitations of genetic investigation. The most common reason for undergoing genetic testing was to gather information for their relatives, while the one for not taking the test was lack of someone who encourages them to do so. Most of genetically tested patients believed that the results could aid in the search for a treatment. Almost all patients (98.9%) performed the test through the Italian National Health System.

Conclusions:

Our study investigated the tendency of Italian patients affected by IRDs to undergo genetic testing, highlighting the importance of educating both patients and healthcare professionals on this topic.

Abstract 16

GENE THERAPY RESCUES PHOTORECEPTOR FUNCTION, MORPHOLOGY AND SURVIVAL IN A PRE-CLINICAL MODEL OF CDHR1-ASSOCIATED RETINAL DEGENERATION

Oral

Yusuf I.*, Mcclements M., Maclaren R., Charbel Issa P.

University of Oxford ~ Oxford ~ United Kingdom

Purpose:

To evaluate the long-term efficacy and safety of retinal gene therapy in a pre-clinical model of CDHR1-associated retinal degeneration – an as yet untreatable, blinding disorder characterised by progressive cone and rod photoreceptor degeneration that may affect over 200,000 individuals worldwide.

Methods:

Cdhr1-/- (n=28) and C57BL/6J control mice (n=23) underwent paired superior sub-retinal injections of AAV8.GRK1.CDHR1 (1.5x10E8 vector genomes) and PBS vehicle control in the fellow eye at 3-4 weeks of age. Dark- and light-adapted electroretinography (ERG) responses (to 12-months post-injection), photoreceptor layer thickness measurements on optical coherence tomography (OCT) imaging (to 18-months post-injection) and scotopic (0.01 lux) and photopic (1000 lux) optomotor behavioural responses (to 22-months post-injection) were compared between AAV- and PBS-injected control eyes. Outer retinal ultrastructure was evaluated by electron microscopy at 22-months post-injection.

Results:

In Cdhr1-/- mice, AAV8.GRK1.CDHR1 rescued A-wave amplitudes ($p<0.0001$) and B-wave amplitudes ($p<0.0001$) on dark-adapted ERG and B-wave response amplitudes on light-adapted ERG ($p<0.0001$) compared to PBS-injected eyes, sustained to 12-months post-injection. Scotopic and photopic optomotor behavioural responses were preserved in AAV-injected Cdhr1-/- eyes only ($p<0.0001$), to 21-months post-injection. OCT imaging demonstrated preservation of the photoreceptor layer ($p<0.0001$) and photoreceptor outer segment regeneration ($p<0.0001$) in AAV-injected Cdhr1-/- eyes only. Full-length outer segment regeneration was confirmed on electron microscopy. In C57BL/6J mice, ERG responses, photoreceptor thickness measurements and optomotor responses were similar in treated versus control eyes ($p>0.05$ for all comparisons).

Conclusions:

These data provide proof-of-principle of the efficacy and safety of CDHR1 gene therapy in a pre-clinical model of CDHR1-associated retinal degeneration. Rod and cone rescue occur through prevention of photoreceptor cell death and photoreceptor outer segment regeneration. A follow-on clinical trial is warranted.

Abstract 169

DIURNAL CHANGES OF MACULAR ANATOMY AND SENSITIVITY IN X-LINKED JUVENILE RETINOSCHISIS

Oral

Mautone L.*, Yevgeniya A., Spitzer M.S., Dulz S.

Ophthalmology Department, University Medical Center Hamburg-Eppendorf ~ Hamburg ~ Germany

Purpose:

Macular schisis is one of the main features of x-linked juvenile retinoschisis (XLRS). Our aim is to investigate anatomical and functional changes of the macular thickness and sensitivity during course of the day.

Methods:

In this single-center, prospective cross-sectional observational cohort study, patients with genetically verified retinoschisin-1 gene mutation and the classic XLRS phenotype were enrolled. Visual acuity testing with Early Treatment Diabetic Retinopathy Study charts, spectral domain optical coherence tomography (OCT) and microperimetry (MP) were performed twice a day, respectively at 9 am and 4 pm. Central retinal thickness (CRT) and macular volume (MV) were measured in order to assess morphology changes. Moreover, to test macular function average threshold (AT) and fixation stability (P1 and P2) were measured with a 4-2 strategy.

Results:

16 eyes of 8 patients were enrolled. Overall mean BCVA and AT improved from 50.37 letters (SD ± 14.69) to 53.12 letters (SD ± 14.12) and the AT from 19.23 dB (SD ± 2.87 dB) to 21.37 dB (SD ± 2.83 dB) significantly (p=0.026 and p=0.001 respectively). No significant diurnal change of OCT anatomical measurements or fixation stability parameters was measured. The subanalysis of eyes with CRT > 400µm at baseline showed a mean CRT reduction of 35.6 µm (SD ± 14.98 µm, p=0.0001) during the day.

Conclusions:

The herein presented case series was able to verify diurnal macular architectural and functional alteration in the course of the day. Subanalysis suggests that in particularly XLRS patients with prominent macular schisis alter anatomically during the day. These findings should be appreciated in upcoming clinical trial designs for XLRS.

Abstract 74

LOSS OF NASAL RETINAL SENSITIVITY MAY NEGATIVELY IMPACT ABILITY TO READ ACROSS THE ETDRS LETTER CHART

Oral

Baffour--Awuah K.*[1], Taylor L.[1], Josan A.[1], Jolly J.[2], Maclaren R.[1]

[1]Nuffield Laboratory of Ophthalmology ~ Oxford ~ United Kingdom, [2]Vision and Eye Research Institute, Anglia Ruskin University ~ Cambridge ~ United Kingdom

Purpose:

Choroideremia patients often exhibit asymmetric retinal sensitivity loss and significantly constricted visual fields and report difficulties fixating on ETDRS chart letters. The study investigates whether ETDRS letter error positions relate to asymmetrical retinal sensitivity in choroideremia, RPGR-associated retinitis pigmentosa (RPGR-RP), exhibiting symmetrical sensitivity loss, and control participants.

Methods:

Monocular visual acuity (VA) was measured using the standard ETDRS letter chart at 4m. Total errors per column were counted for rows up to and including 1 row below the “threshold” row (lowest row with up to two errors) and were analysed with a weighted formula to generate weighted error scores for each participant. Macular sensitivity was assessed using Macular Integrity Assessment microperimetry (Centervue SpA, Padova, Italy). Mean temporal-minus-nasal macular sensitivity was calculated. Correlation analyses were applied. A positive correlation indicates that greater letter errors occurred on the side of the chart visualised towards the relatively less sensitive retina.

Results:

Sixty eyes from 30 choroideremia (median age 44.1 years [IQR 33.8-47.8]), 28 eyes from 14 RPGR-RP (median age 29.7 years [IQR 25.3-35.9]) and 42 eyes from 21 control (median age 25.9 years [IQR 22.7-30.6]) participants were examined. Results showed significantly greater temporal macular sensitivity in the RE of choroideremia participants (Wilcoxon signed-rank, P=0.038) but not LE. RPGR-RP participants and controls showed no asymmetry in macular sensitivity. There was a significant positive correlation between weighted error scores and macular sensitivity asymmetry in the RE of choroideremia participants (Spearman’s rank, ρ=0.40, P=0.031). No correlation was found in RPGR-RP or control eyes.

Conclusions:

Significant asymmetry in macular degeneration in the RE of choroideremia participants may affect ability to localise ETDRS chart letters and therefore should be considered a source of variability. Using single crowded optotype VA test with forced choice paradigms, such as the Electronic Visual Acuity (EVA) (EMMES©), may overcome this issue.

Abstract 125

OCULAR IMMUNE RESPONSE IN RETINA GENE THERAPY

Oral

Huang S.*

Retina Center of Ohio ~ Cleveland ~ United States of America

Purpose:

There is growing awareness that an ocular immune response may present as an adverse event following ocular gene therapy. Factors affecting host immune responses including the features of the viral vector, delivery method, promotor transgene characteristics, and ocular disease will be reviewed. Pathophysiology, consequences, and mitigation strategies will be discussed.

Methods:

The current literature on complications of ocular gene therapy will be reviewed.

Results:

There is a growing understanding that despite the immune privilege of the eye, innate and host adaptive responses may arise to challenge the durability of transduction efficiency. Treatment-emergent adverse events have occurred from the vector, surgery, and effect on the target tissue. Mitigation strategies include choice of vector, gene therapy payload, use of anti-inflammatory therapy, and surgical techniques that avoid the macula. It remains unclear what role the presence of serum neutralizing antibodies plays in the development of an ocular immune response.

Conclusions:

Ocular gene therapy holds great promise for the curative treatment of monogenic inherited retinal disease. The choice of vector, payload, patients, and disease selection has bearing on the immunogenicity and adverse events associated with clinically effective gene transfer. Scientific, ethical, and financial challenges to this technology still exist.

Abstract 31

CRISPR DNA BASE EDITING STRATEGIES FOR TREATING RETINITIS PIGMENTOSA CAUSED BY MUTATIONS IN RHODOPSIN

Poster

Kaukonen M.*, Mcclements M.E., Maclaren R.E.

University of Oxford ~ Oxford ~ United Kingdom

Purpose:

Pathogenic variants in the Rhodopsin (RHO) gene are major cause for autosomal dominant RP (adRP). Despite extensive attempts, the disease still lacks standardized curative treatment. Recently developed CRISPR DNA base editors offer an exciting opportunity to correct pathogenic variants and hence could be utilised to develop therapy for RHO-associated adRP.

Methods:

All disease-associated RHO variants were downloaded from the Leiden Open Variation Database (LOVD), ClinVar and Genome Aggregation Database and analysed for their amenability to base editing first based on the variant types. Then, suitable PAM sites were searched for the currently available base editors utilizing the Streptococcus pyogenes Cas9 (SpCas9), Staphylococcus aureus Cas9 (SaCas9) or the KKH variant of SaCas9 (KKH-SaCas9) utilising the Benchling software. Finally, unwanted bystander edits were analysed for each guideRNA to assess the safety of the approach.

Results:

Of all the reported pathogenic RHO variants (n=247), 55% could in theory be corrected with base editors. Importantly, nine of the ten most common disease-associated RHO variants were editable. However, PAM sites were available for only 32% of the editable variants and unwanted bystander edits were predicted for the majority of the designed guide RNAs.

Conclusions:

Base editing offers exciting possibilities to treat RHO-associated adRP in future. However, further research is needed to develop base editing constructs that will provide available PAM sites for more variants and that will not introduce potentially harmful bystander edits.

Abstract 149

THE VALUE OF VISION REHABILITATION AFTER IMPLANT OF RETINAL PROSTHESIS: OUR EXPERIENCE WITH ARGUS II.

Poster

Guidobaldi M.*[1], Piscopo P.[1], Sulfaro M.[1], Silvestri V.[1], Turco S.[1], Fortini S.[1], Amore F.[1], Rizzo S.[2]

[1]National Low Vision Center, Fondazione Policlinico Universitario "A. Gemelli" IRCCS ~ Rome ~ Italy, [2]Fondazione Policlinico Universitario "A. Gemelli" ~ Rome ~ Italy

Purpose:

Retinal implants provides limited functional vision to otherwise blind patients. Appropriate vision rehabilitation treatment is essential for the optimization of this new devices. We present the multidisciplinary pathway of personalized vision rehabilitation of seven Retinitis Pigmentosa patients with the Argus II retinal prosthesis implant (SecondSight).

Methods:

The rehabilitation process for Argus II retinal prosthesis users followed the traditional approach of assessment and definition of rehabilitation goals and took place within 8 weeks after surgery, as suggested by established guidelines. The course consisted of ten sessions with trained orthoptists and, from mid-term, 10 sessions with the orientation and mobility instructor. Each session lasted 2 hours and took place twice a month at the National Low Vision Center. In addition, the patients performed daily exercises on their own or in the presence of a caregiver.

Results:

Functional vision rehabilitation covered the main functions of the Argus II system and camera positioning; training in small- and large-scale scanning movements; luminance discrimination and shape recognition.
Orientation and mobility training was aimed at identifying landmarks in space (windows, doors); identifying zebra crossings for crossing streets and spotting obstacles; moving around the environment by following corridor lights, a person or the edge of the pavement with the help of the white cane.

Conclusions:

The outcome was different between those who followed the rehabilitation path consistently and those who did not. Our experience indicates that Vision Rehabilitation that allows the retinal prosthesis to be used independently is essential to its success; we feel to say that it becomes essential for any type of prosthesis.

Abstract 28

A SILICONE OIL-FREE SYRINGE TAILORED FOR INTRAVITREAL INJECTION OF BIOLOGICS

Oral

Melo G.*[1], Gjølberg T.[2], Lode H.E.[2], Mester S.[2], Sivertsen M.S.[2], Jørstad Ø.K.[2], Andersen J.T.[2], Moe M.C.[2]

[1]Federal University of São Paulo ~ São Paulo ~ Brazil, [2]University of Oslo ~ Oslo ~ Norway

Purpose:

Siliconized syringes can deposit silicone oil (SiO) droplets in the vitreous and cause patient discomfort. Our aim was to compare a new SiO-free syringe to commercially available prefilled syringes (PFS) with aflibercept and ranibizumab with regard to release of SiO.

Methods:

We compared the new SiO-free syringe (Zero Residual Silicone Free- ZR, SJJ Solution) with commercially PFS containing ranibizumab and aflibercept by imaging flow cytometry. We also tested two additional syringes, one SiO-free (HSW Norm-Ject) and one siliconized (BD Ultra-Fine). SiO droplets from the syringes with and without agitation were identified by fluorescent labeling of SiO particles. All syringes were attached to a standard 30-gauge siliconized needle.

Results:

The ZR SiO-free syringe released 19,469 ± 13,448 particles/mL and 15,803 ± 12,443 particles/mL with and without agitation, respectively, whereas the Norm-Ject released 63,558 ± 69,414 and 16,438 ± 10,961 particles/ml, with and without agitation, respectively. The BD Ultra-Fine released a significantly higher number of particles compared to the SiO-free syringes, reaching 1,870,428 ± 1,234,150 particles/ml with agitation. Both aflibercept PFS and ranibizumab PFS showed a considerable number of SiO particles, both with and without agitation (464,291 ± 275,350 particles/mL and 261,243 ± 56,938 particles/mL for aflibercept PFS; 138,801 ± 29,207 and 80,758 ± 38,276 particles/mL for ranibizumab PFS).

Conclusions:

We conclude that commercially available aflibercept and ranibizumab PFS have increased risk of SiO release compared to both the new Zero Residual SiO-free as well as the Norm-Ject. The BD Ultra-Fine released the most SiO particles.

Number of SiO particles

Syringe	Sample size (n)	Not agitated (particles/mL)	Agitated (particles/mL)	p-values
Zero Residual SiO Free	12	15,804 ± 12,443	19,470 ± 13,448	0.496
HSW Norm-Ject	9	16,439 ± 10,961	63,559 ± 69,414	0.077
BD Ultra-Fine	12	177,816 ± 138,655	1,870,429 ± 1,234,151	0.001
Aflibercept PFS	3	261,243 ± 56,938	464,291 ± 275,350	0.329
Ranibizumab PFS	3	80,758 ± 38,276	138,801 ± 29,207	0.110

Abstract 14

IN-OFFICE TECHNIQUE MANAGEMENT OF A THREE TIMES RE-OPENED FULL THICKNESS MACULAR HOLE.

Poster

Ananikas K.*

My Retina Athens Eye Centre ~ Athens ~ Greece

Purpose:

A case report of a 68-year-old patient with a history of FTHM treated two times with PPV on her RE. Due to a three times FTMH recurrence, she was treated with an in-office fluid-SF6 exchange which successfully closed the hole every time.

Methods:

The patient's condition was diagnosed by the Spectralis OCT (Spectralis, Heidelberg Engineering, Heidelberg, Germany) in all of the occasions. No operation took place and the in-office fluid-SF6 exchange procedure was performed until 2.5ml of SF6 was inside the vitreous cavity. At the end of the procedure, all patients were instructed to be in a prone position for at least a week and were given antibiotic/corticosteroid (tobramycin / dexamethasone) eye drops (Tobradex, Alcon Laboratories, Inc.) four times a day.

Results:

The FTMH successfully closed after the absorption of the SF6 bubble every time the aforementioned in-office procedure took place. Following the anatomic macular restoration, the Visual Acuity (VA) also increased each time.

Conclusions:

The minimal surgical in-office technique of SF6 injection for the management of reopened macular holes after a recent PPV procedure shows promising results even to rare conditions as the one we present.

Abstract 107

PERIPAPILLARY CHANGES OF RNFLT AFTER SUCCESSFUL TREATMENT FOR RRD

Oral

Vlachou A.*, Stavrakakis A., Tsilimbaris M.

University Hospital of Heraklion ~ Heraklion ~ Greece

Purpose:

To evaluate the peripapillary retinal nerve fibre layer thickness (RNFLt) over time after successful repair of rhegmatogenous retinal detachment (RRD).

Methods:

The 45 patients of the study have been successfully treated for RRD with pneumatics retinopexy or pars plana vitrectomy with SF6 gas tamponade. As study sector of peripapillary RNFL was used the sector that corresponds best to the most severely affected part of the detached area. Values of that sector at 1st, 6th and 12th month post-surgery were measured and their change in time was compared to: 1. Values of the same sector of the fellow eye 2. Values of the most unaffected sector of the detached eye.

Results:

From 45 patients, 13 eyes, that have followed the one-year follow-up, and are analysed here. After comparing values of the most affected and the most unaffected sector of the detached eye at 1st, 6th and 12th month post-op, a statistically significant reduction of RNFLt over time was found. On the other hand, comparison of the most affected and the most unaffected sector of the fellow eye did not reveal any change of the RNFL thickness over time.

Conclusions:

It seems, that even after an anatomically successful repair of RRD, changes can be triggered in the retinal tissue including the RNFL and these changes could be reflected in the peripapillary area. RNFLt does not seem to change significantly over time in any sector of the fellow eye.

Abstract 63

THE MOVING EYE. A REVIEW OF THE UNIFYING BIOMECHANICAL HYPOTHESIS ON THE PATHOGENESIS OF MACULA DISORDERS"

Oral

Theocharis I.*

Primeoneye Vision Solutions ~ Athens ~ Greece

Purpose:

To present a summary of the facts that show the impact of the constant stress on the posterior pole due to ocular movements.

Methods:

A review of our presentations during Rome past meetings from 2014 to 2022 is presented. Image related evidence and FEM simulation are developed.

Results:

Strong evidence arise that show the correlation between ocular movements and macula lesions as seen in OCT images. A mechanical simulation with a FEM model supports the hypothesis. We were able to provoke layer separation and makula rhexis with sole biomechanics conditions, based on literature data on tissue elastic properties.

Conclusions:

Ocular movements and their biomechanical effects on the posterior pole may play a major pathogenetic factor to the expression of macula pathology of various disorders.

Abstract 104

ACUTE POST-OPERATIVE MACULAR EDEMA AND SEROUS RETINAL DETACHMENT AFTER STANDARD INTRACAMERULAR CEFUROXIME INJECTION IN UNEVENTFUL PHACOEMULSIFICATION: A CASE REPORT.

Poster

Kagkelari E.*[1], Dell"Acqua M.[1], Caminada L.M.[2], Trabucchi G.[1]

[1]ASST Ovest Milanese ~ Legnano ~ Italy, [2]Ospedale San Raffaele ~ Milano ~ Italy

Purpose:

The purpose of this report is to describe a case of acute macular edema and multifocal serous retinal detachment in the first post-operative day after an uneventful cataract surgery with standard dose of intracamerular cefuroxime.

Methods:

A case of a 63 year old male patient who underwent a right eye phacoemulsification surgery for corticonuclear cataract, performed by an experienced surgeon under topical anesthesia (oxybuprocaine hydrochloride 4mg/ml). At the end of the procedure, standard dose cefuroxime (1mg/0,1mL) was injected in the anterior chamber as endophthalmitis prophylaxis. Pre-operatory and post-operatory ophthalmic examination (visual acuity (VA), slit lamp examination (SLE), intraocular pressure (IOP) measurement and fundus examination) were performed.

Results:

The patient had no other ocular or systemic comorbidities. Pre-operatory VA was 0,60 logMAR; the day after surgery the VA was 1.3 logMAR. The fundus examination and OCT revealed a massive serous macular detachment and macular edema, which involved the posterior pole beyond the temporal arterial and venous vessels. Both have been regressed after 4 days of standard post-operative local therapy (Bronfenac eye drops 2 times/day and Netilmicin sulphate/Dexametasone sodium phosphate eye drops 4 times/die). The final visual outcome was 0.10 logMAR, with mild metamorphopsia left, while final IOP was 10 mmHg.

Conclusions:

Transient serous retinal detachment with macular edema after intracamerular cefuroxime injection in uneventful phacoemulsification have been described. Most of them are associated with accidental antibiotic overdose, while standard dose regimen is much less frequent. More studies are needed in order to understand the pathophysiologic mechanism of this event.

Abstract 200

NANOPHTHALMOS: BEYOND THE LENS

Oral

Dragotto F.*[1], Pacini B.[2], De Angelis L.[2], Barca F.[2]

[1]AOU Careggi ~ Florece ~ Italy, [2]Piero Palagi Hospital ~ Florence ~ Italy

Purpose:

To describe a case of bilateral choroidal effusion syndrome in a 60 yo man affected by nanophthalmos after YAG laser iridotomy and the initiation of a prostaglandin lowering pressure therapy.

Methods:

A 60 yo man was referred to the ophthalmology department of the Piero Palagi hospital for monolateral eye and head pain associated with blurred vision. A right pupillary block was diagnosed associated to bilateral nanophthalmos. The axial length was 16,03 mm in the RE and 15,87 mm in the LE, the anterior chamber depth was 1,32 mm in the RE and 1,28 mm in the LE. Bilateral iridotomies were performed, Bromfenac BID and travoprost in the evening, due to persistent high IOP, were prescribed. Cataract surgery was planned in order to avoid further pupillary blocs alongside with Pilocarpine TID.

Results:

The patient was re-evaluated periodically and within 10 days after the iridotomies he complained of bilateral blurred vision. The anterior segment showed a remarkable hyperemia without any inflammatory sign into the anterior chamber and a high grade of myosis due to the pilocarpine administration. Macular OCT, B-scan echography and UBM, revealed a bilateral serous inferior retinal detachment. Bilateral choroidal effusion syndrome was diagnosed. Cataract surgery was put on standby and systemic and topical steroids were prescribed. Travoprost was exchanged with Brinzolamide/timolol eyedrop BID and weekly examinations were planned. The serous detachment gradually resolved and steroid therapy was tapered.

Conclusions:

Inflammation and hypotony after iridotomies could be prone to promote choroidal effusion in eyes affected by nanophthalmos where, sometimes, could be spontaneous. Prostaglandin therapy can exacerbate the serous detachment because of an augmented venous permeability of the choroid. Topical and systemic therapy could be effective to restore the retinal omeostasys

Abstract 232

ASSESSMENT OF CHOROIDAL THICKNESS IN MULTIPLE SYSTEM ATROPHY AND PARKINSON'S DISEASE.

Oral

Gioia M.*[1], De Bernardo M.[1], Capasso L.[2], Barone P.[3], Picillo M.[3], Pellecchia M.T.[3], Erro R.[3], Amboni M.[3], Salerno G.[1], Russillo M.C.[3], Rosa N.[1]

[1]Eye Unit – Department of Medicine, Surgery, and Dentistry "Scuola Medica Salernitana", University of Salerno, via S. Allende – 84081 - Baronissi, Salerno, Italy – Prof Nicola Rosa ~ Salerno ~ Italy, [2]ASL Napoli 1, Napoli, Italy ~ Napoli ~ Italy, [3]Neurology Unit – Department of Medicine, Surgery, and Dentistry "Scuola Medica Salernitana", University of Salerno, via S. Allende – 84081 - Baronissi, Salerno, Italy – Prof Paolo Barone ~ Salerno ~ Italy

Purpose:

Assessment of postural changes in choroidal thickness (ChT) in patients with multiple system atrophy (MSA), Parkinson's disease (PD) and healthy controls (HC).

Methods:

20 MSA patients, 21 PD patients and 14 HC patients were examined. Institutional Review Board approval was obtained for this study. Each participant gave written, informed consent for study participation. The study adhered to the tenets of the Declaration of Helsinki. All subjects underwent a comprehensive ophthalmological examination, including corneal thickness, ChT, and axial length (AL) measurements. Heidelberg Spectralis EDI-OCT was performed in sitting and standing position to detect ChT. Statistical Analyses were performed with the SPSS package (version 25, SPSS, IBM). Wilcoxon test was used to compare postural changes within the groups.

Results:

The mean subfoveal ChT in MSAs was 240 ± 92 µm in sitting position and 215 ± 94 µm in standing position with a significant reduction ($p = 0.008$). The mean subfoveal ChT in PD was 258 ± 79 µm sitting and 259 ± 76 µm standing ($p = 0.887$). In HC it was 244 ± 36 µm in sitting position and 256 ± 37 µm in standing position with a significant increase ($p = 0.007$).

Conclusions:

The significant postural changes of ChT can be considered additional hallmarks of autonomic dysfunction in MSA, further studies are needed to consider them as biomarkers in the differential diagnosis with PD.

Abstract 65

MACULAR INNER NEURODEGENERATION MAY PREDICT THE RESPONSE TO IDEBENONE IN PATIENTS WITH LEBER'S HEREDITARY OPTIC NEUROPATHY

Oral

Berni A.*, Borrelli E., Cascavilla M.L., Barresi C., Battista M., Lari G., Reibaldi M., Barboni P., Bandello F.

San Raffaele Institute: IRCCS Ospedale San Raffaele ~ Milan ~ Italy

Purpose:

To assess the relationship of demographics, clinical characteristics and structural optical coherence tomography (OCT) findings to long-term visual outcomes in patients with Leber's hereditary optic neuropathy (LHON) treated with idebenone. Design: Retrospective cohort study.

Methods:

A total of 17 participants (34 eyes) with LHON treated with idebenone within 1 year after disease onset and 24 months of regular follow-ups were retrospectively enrolled. At baseline, structural OCT volume scans of the macula and optic nerve were reviewed to measure metrics reflecting neuronal loss (macular ganglion cell complex (GCC) and peripapillary retinal nerve fiber layer (RNFL) thicknesses). Stepwise multiple regression analyses were computed to assess associations between final best-corrected visual acuity (BCVA) at 2 years and change in BCVA from baseline at 2 years as dependent variables with demographics, clinical characteristics and structural OCT metrics at baseline.

Results:

The BCVA was 1.6±0.8 LogMAR (Snellen VA of ~ 20/800) at baseline (visit before the initiation of treatment) and 1.0±0.7 LogMAR (Snellen VA of 20/200) at the 2- year follow-up visit ($p<0.0001$). Mean±SD change in BCVA from baseline at 2 years was -51.9±35.9%. In multivariable analysis, the strongest associations with final BCVA were with baseline BCVA ($p=0.012$), superior macular GCC thickness ($p=0.044$), superotemporal macular GCC thickness ($p=0.010$), and inferotemporal macular GCC thickness ($p=0.015$). Similarly, the strongest associations with delta BCVA were with superior macular GCC thickness ($p=0.045$), superotemporal macular GCC thickness ($p=0.047$), and inferotemporal macular GCC thickness ($p=0.030$).

Conclusions:

We identified OCT biomarkers associated with long-term (i.e. 2-year) visual outcomes in patients with LHON treated with idebenone therapy in the first year after disease onset. Thinning of the GCC in the superior and temporal parafoveal regions was associated with worse long-term visual outcomes in these patients

Abstract 106

POSTERIOR STAPHYLOMA AS HALLMARK OF PATHOLOGIC MYOPIA AND SEVERE PATHOLOGIC MYOPIA

Oral

Puertas M.*, Flores--Moreno I., Almazan--Alonso E., Ruiz--Medrano J., Vega--Gonzalez R., Garcia--Zamora M., Ruiz--Moreno J.M.

Puerta de Hierro University Hospital ~ Madrid ~ Spain

Purpose:

The aim of this study was to study the incidence and clinical repercussion of posterior staphyloma in pathologic myopia and severe pathologic myopia.

Methods:

Cross-sectional, non-interventional study of consecutive 473 eyes of 259 high myopic patients (spherical equivalent >-6.0 D and/or >26 mm of axial length (AL)). Demographic data were recorded from medical records. All patients underwent complete ophthalmologic examination, best corrected visual acuity (BCVA), axial length (AL) and multimodal imaging. Eyes were graded based on ATN system and classified as pathologic myopia (PM) (if ≥A2) or severe PM (if ≥A3, ≥T3, and/or N2). Posterior staphyloma classification was made according to Curtin' and Ohno-Matsui'.

Results:

The incidence of posterior staphyloma was 69.4% (n=328/473). PM was diagnosed in 62.2% and severe PM in 39.7%, presenting staphyloma 86.7% and 94.1%, respectively. Severe PM eyes showed higher incidence of staphyloma ($p<0.05$) than PM subgroup. Within PM group, eyes with staphyloma presented worse BCVA, higher AL, were older, had higher score in A and T components ($p<0.01$). Regarding severe PM group, staphyloma' eyes had worse BCVA, higher AL and were older ($p<0.01$). Nevertheless, no differences were obtained in ATN components ($p>0.05$).
The risk of posterior staphyloma presence in PM and severe PM eyes was 89.8% and 96.7%, respectively.

Conclusions:

The presence of posterior staphyloma determines worse BCVA and higher degree of myopic maculopathy. Posterior staphyloma should be considered practically as a constant hallmark of PM and, even more, severe PM, determining the follow-up and prognosis of these patients.

Abstract 108

IMPACT OF POSTERIOR STAPHYLOMA ON MYOPIC MACULOPATHY AND VISUAL PROGNOSIS

Oral

Puertas M.*, Flores--Moreno I., Ruiz--Medrano J., Almazan--Alonso E., Garcia--Zamora M., Vega--Gonzalez R., Ruiz--Moreno J.M.

Puerta de Hierro University Hospital ~ Madrid ~ Spain

Purpose:

To analyze the impact of posterior staphyloma and its subtypes on incidence and severity of myopic maculopathy and visual prognosis.

Methods:

Cross-sectional, non-interventional study of 473 eyes of 259 consecutive high myopic patients (spherical equivalent >-6.0 D and/or >26 mm of axial length (AL)). Demographic data were retrieved from medical records. All patients underwent complete ophthalmologic examination and multimodal imaging. Eyes were graded based on ATN system and classified as pathologic myopia (PM) (if ≥A2) or severe PM (if ≥A3, ≥T3, and/or N2). Posterior staphyloma according to Curtin' and Ohno-Matsui'classifications was analyzed.

Results:

Posterior staphyloma was present in 69.4% of eyes. Patients with posterior staphyloma were older, had greater AL, worse BCVA and higher stage in each ATN component ($p<0.01$). Moreover, compound subgroup showed significant worse BCVA and greater stage in each ATN components ($p<0.01$). Staphylomas with macular involvement presented worse visual acuity, higher AL and greater stages in ATN components($p<0.01$). The risk of posterior staphyloma presence increased by 8% every year-old increase in age ($p<0.01$) and 70% for every mm in AL ($p<0.01$). Posterior staphyloma was the best predictor for BCVA in myopic patients associating a BCVA' decrease of 0.24 logMAR-units ($p<0.01$).

Conclusions:

Posterior staphyloma presence determines high risk of myopic maculopathy and therefore worse visual prognosis, especially those with macular involvement. Age and AL have been identified as risk factors for the presence of staphyloma. Posterior staphyloma represented the best predictor for BCVA in highly myopic patients.

Abstract 22

LONG-TERM INCIDENCE AND RISK FACTORS OF MACULAR FIBROSIS, MACULAR ATROPHY, AND MACULAR HOLE IN EYES WITH MYOPIC NEOVASCULARIZATION

Oral

Cicinelli M.V., La Franca L.*, De Felice E., Rabiolo A., Marchese A., Battaglia Parodi M., Introini U., Bandello F.

Department of Ophthalmology, IRCCS San Raffaele Scientific Institute, Milan, Italy ~ Milan ~ Italy

Purpose:

To identify the risk factors associated with myopic macular neovascularization (mMNV)-related complications in patients treated with intravitreal anti-vascular endothelial growth factor (VEGF) agents.

Methods:

Longitudinal cohort study of myopic eyes (n=313) with active mMNV and median[interquartile range, IQR] follow-up of 42[18-68] months after initiation of anti-VEGF treatment. Patients' clinical and mMNV characteristics were collected at baseline. Subsequent optical coherence tomography (OCT) scans were inspected for mMNV- related complications. Best-measured visual acuity (BMVA) values were retrieved from each visit. Main outcome measures: Incidence rate and hazard ratio (HR)(95% confidence interval, CI) of risk factors for fibrosis and macular atrophy calculated with Kaplan- Meier curves and Cox regression models. Crude incidence of macular hole (MH). Longitudinal BMVA changes.

Results:

Five-year incidence of fibrosis, atrophy, and macular hole were 34%, 26%, and 8%, respectively. Rate of fibrosis[95%CI] was 10.3[8.25-12.6] for 100 person-year. Risk factors were subfoveal mMNV location (HR[95%CI]=12.7[2.70-56.7]vs.extrafoveal, p=0.001) and intraretinal fluid at baseline (HR[95%CI]=1.75[1.05-2.98], p=0.03). Rate of macular atrophy[95%CI] was 6.5[5-8.3] for 100 person-year. Risk factors were diffuse (HR[95%CI]=2.20[1.13-5.45]vs.tessellated fundus, p=0.02) or patchy chorioretinal atrophy (HR[95%CI]=3.17[1.32-7.64]vs.tessellated fundus, p=0.01) at baseline, and more numerous anti-VEGF injections before baseline (HR[95%CI]=1.21[1.06-1.38] for each treatment, p=0.005). Eyes with fibrosis and macular atrophy had faster BMVA decay over follow-up. Twenty eyes (6%) developed MH. Two subtypes of MH were identified: "atrophic" and "tractional".

Conclusions:

mMNV-related complications are common in the long term despite initially successful treatment and have detrimental effects on visual acuity. Insights on their incidence and risk factors may help for future treatments to mitigate sight-threatening outcomes.

Abstract 99

ATN GRADING SYSTEM IN A DOME-SHAPED MACULA AND RIDGE-SHAPED MACULA HIGHLY MYOPIC COHORT.

Poster

Garcia--Zamora M.*, Puertas M., Flores--Moreno I., Ruiz--Medrano J., Almazan--Alonso E., Vega--Gonzalez R., Ruiz--Moreno J.M.

Hospital Universitario Puerta de Hierro Majadahonda ~ Madrid ~ Spain

Purpose:

To analyze the ATN grading in highly myopic patients with dome-shaped macula (DSM) and ridge-shaped macula (RSM).

Methods:

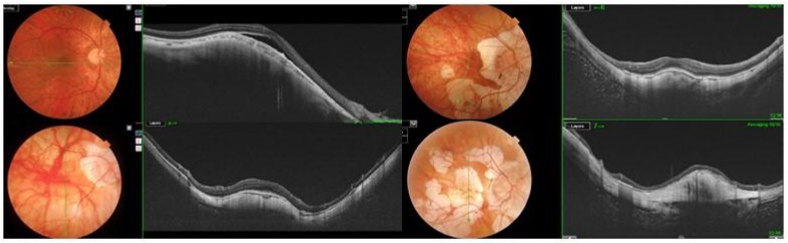
This was a cross-sectional, noninterventional study. 57 eyes of 38 different patients were included. They were classified as DSM or RSM based on the number of radial scans affected on the swept-source optical coherence tomography (SS-OCT) (12=DSM; <12=RSM). They were graded using the ATN system for myopic maculopathy by 2 masked retina specialists that assessed the atrophic (A), tractional (T), and neovascular (N) components. As complementary measurements, age, axial length (AL) and best corrected visual acuity (BCVA) were collected. Height and orientation of the macular bulge and the presence of Bruch´s membrane defects, scleral perforating vessels and staphyloma were recorded.

Results:

Out of total 57 eyes, 13 eyes (22.8%) were classified as DSM. Regarding the atrophic component (A), there were statistically significant differences between groups, with DSM group showing a greater stage of atrophy (predominantly stage A3 in 69.2% of the sample) compared to the RSM group (predominantly stage A2 in 61.3% of the sample) ($p<0.05$). For the tractional (T) and neovascular (N) components, there were no significant differences between groups. The presence of Bruch´s membrane defects was more frequently seen in DSM ($p<0.05$).

Conclusions:

DSM showed more Bruch´s membrane defects and a greater grade of the atrophic component. As Bruch´s membrane may have biomechanical properties, the defects found around the macula, added to the major atrophic component, may be a cause of a local relaxation that induce a central bulge forming the dome.



Abstract 185

CHOROIDAL VASCULAR CHANGES SECONDARY TO OCULAR IRRADIATION

Oral

Midena G.*[1], Frizziero L.[2], Bruno M.[1], Cecere M.[1], Micera A.[1], Esposito G.[1], Pilotto E.[2], Midena E.[2], Parrozzani R.[2]

[1]IRCCS – Fondazione Bietti ~ Rome ~ Italy, [2]Department of Ophthalmology, University of Padova ~ Padua ~ Italy

Purpose:

To describe progressive choroidal vascular changes secondary to ocular irradiation for uveal melanoma (UM).

Methods:

Sixty consecutive eyes affected by primary UM treated with Iodine-125 brachytherapy were enrolled. An age-matched control group was included. Each patient underwent full ophthalmological examination, including best-corrected visual acuity, ophthalmoscopy, fundus photography, Spectral Domain OCT and OCT Angiography(OCTA). Qualitative and quantitative vascular features of the choriocapillaris were analyzed on OCTA. The aspect of the large choroidal vessel was also notified. Moreover, choroidal vascular index(CVI) -the ratio between the luminal choroidal area (LCA) and the total choroidal area (TCA)- was calculated in the subfoveal 1000 µm area. Follow-up was performed after 1, 3 and 6 months and every 6 months thereafter.

Results:

Signal void spots were found at the level of choriocapillaris in 54 patients (90%). Rarefaction and dilation of the choroidal vessels were detected in 57 (94%) and 25 (41%) patients, respectively. At the choriocapillaris level, the vascular density progressively decreased ($p<0.0001$). The irradiated eyes exhibited a significantly lower CVI value in comparison to controls ($p<0.0001$).

Conclusions:

Radiation side effects are not limited to the retinal vessels but also involve choroidal circulation. These findings carefully suggest that choroidal vasculature changes occur early and precede the retinal ones.

Abstract 217

TREATMENT OF SMALL CHOROIDAL TUMORS WITH DIODE LASER - A CASE STUDY

Oral

Brzovic Šaric V.*, Šaric B., Varošanec A.M., Markovic L.

University Eye Department of the University Hospital "Sveti Duh" ~ Zagreb ~ Croatia

Purpose:

To determine the efficacy of infrared diode laser (810 nm) as primary treatment or as complementary method to radiotherapy or surgical resection in very selected cases of small choroidal tumors.

Methods:

10 patients diagnosed with small choroidal tumors with prominence less that 3 mm were treated at the University Eye Department of the University Hospital "Sveti Duh". Small choroidal tumors were treated combining two types of laser beams, green and red laser beams in two separate acts. All patients underwent standardized echography, fluoresceine angiography, ultrawidefield fundus photography and a complete ophthalmic examination before and after the treatment.

Results:

All tumors exhibited a reduction of tumor height in a follow-up period of 3 to 14 months. Side effects were minimal. The standardised echography and fluoresceine angiography showed scarring of the tumor tissue. The BCVA was not reduced.

Conclusions:

The two act diode laser treatment of small choroidal tumors achieves adequate control of smaller tumors and at our Department this is the therapy of choice in the treatment of selected tumors up to 3 mm in prominence.

Abstract 115

PHOTODYNAMIC TREATMENT OF RETINOBLASTOMA CELLS USING A FOLATE RECEPTOR-TARGETED NANOPHOTOSENSITIZERS

Poster

Park S.*[2], Yang S.[1]

[1]Chosun University ~ Gwangju-Metropolitan city ~ Korea, Republic of, [2]Kim Eye Hospital ~ Seoul ~ Korea, Republic of

Purpose:

We synthesized folic acid-conjugated poly(ethylene glycol)/Ce6 tetramer conjugates using 3-[3-(2-carboxyethoxy)-2,2-bis(2-carboxyethoxymethyl) propoxy]propanoic acid and fabricated nanophotosensitizers. Their targeting efficiency against a folate receptor and ROS-sensitivity against cancer cells were studied using Y79 retinoblastoma cells. We characterized the physicochemical and biological properties of FAPEGtaCe6 nanophotosensitizers in vitro and in vivo.

Methods:

Ce6 was conjugated with 3-[3-(2-carboxyethoxy)-2,2-bis(2-carboxyethoxymethyl) propoxy] propanoic acid to make Ce6 tetramer via selenocystamine linkages. Carboxylic acid end group of the TA-sese-Ce6 conjugates, FA-PEG was attached again using selenocystamine linkages to make FA-PEG/TA-sese-Ce6 conjugates. Nanophotosensitizers were fabricated by dialysis procedure. Morphological observations showed small diameters of less than 200 nm. Stability of the aqueous FAPEGtaCe6 nanophotosensitizer solution was maintained. When H2O2 was added to the nanophotosensitizer solution, the particle size distribution was changed from a monomodal pattern to a multimodal pattern. Fluorescence intensity and Ce6 release rate from the nanophotosensitizers were also increased by the addition of H2O2.

Results:

In cell culture study, an FAPEGtaCe6 nanophotosensitizer treatment against cancer cells increased the Ce6 uptake ratio, ROS generation and light-irradiated cytotoxicity (phototoxicity) compared with Ce6 alone against various cancer cells. When the folic acid was pretreated to block the folate receptors of the Y79 cells, the intracellular Ce6 uptake, ROS generation and thereby phototoxicity were decreased. These results indicated that they could be delivered by a folate receptor-mediated pathway. Furthermore, an in vivo pulmonary metastasis model using Y79 cells showed folate receptor-specific delivery of FAPEGtaCe6 nanophotosensitizers. The FAPEGtaCe6 nanophotosensitizers had folate receptor specificity in vitro and in vivo.

Conclusions:

The Y79 cells showed a folate receptor-specific delivery capacity for the nanophotosensitizers. When the folate receptor of the Y79 cells in the pulmonary metastatic model was blocked. We suggest that FAPEGtaCe6 nanophotosensitizers are promising candidates for a targeted photodynamic therapy (PDT) approach against Y79 cancer cells.

Abstract 198

AURIGA 24-MONTH, REAL-WORLD RESULTS FROM TREATMENT-NAÏVE PATIENTS WITH MACULAR EDEMA SECONDARY TO RVO TREATED WITH INTRAVITREAL AFLIBERCEPT IN ITALY

Oral

Furino C.*[1], Donati S.[2], Russo A.[3], Allmeier H.[4], Machewitz T.[5], Rittenhouse K.[4], Varano M.[6]

[1]Department of Medical Science, Neuroscience and Sense Organs, Eye Clinic, University of Bari, Azienda Ospedaliero-Universitaria Policlinico Bari, Bari, Italy ~ Bari ~ Italy, [2]Department of Medicine and Surgery, University of Insubria, Varese, Italy ~ Varese ~ Italy, [3]University of Catania, Azienda Policlinico G. Rodolico - S. Marco, Catania, Italy ~ Catania ~ Italy, [4]Bayer Consumer Care AG, Basel, Switzerland ~ Basel ~ Switzerland, [5]Bayer AG, Berlin, Germany ~ Berlin ~ Germany, [6]IRCCS-Fondazione Bietti, Rome, Italy ~ Rome ~ Italy

Purpose:

AURIGA (NCT03161912) evaluated intravitreal aflibercept (IVT-AFL) treatment of diabetic macular edema or macular edema secondary to retinal vein occlusion (RVO) in routine clinical practice. Important insights into IVT-AFL effectiveness and treatment patterns were obtained across 11 countries. Here, we report real-world, 24-month outcomes for treatment-naïve patients with RVO in Italy.

Methods:

AURIGA was a 24-month, prospective, and multicenter observational study. Eligible patients (aged ≥18 years) with treatment-naïve central RVO (CRVO) or branch RVO (BRVO) were treated with IVT-AFL for up to 24 months at their physician's discretion, and according to local regulations. Primary endpoint was visual acuity (VA) change from baseline to Month (M) 12. Secondary endpoints included VA change by M24, central retinal thickness (CRT) change by M12 and M24, and number of IVT-AFL injections by M6, M12, and M24. Statistics were descriptive and no formal hypothesis testing was planned. Systemic and ocular safety were monitored throughout the study.

Results:

In 152 patients (mean age: 66.8 years), mean (95% CI) VA increased from baseline by +12.2 (5.6, 18.8) letters (CRVO) and +10.3 (7.0, 13.6) letters (BRVO) at M12, and +11.8 (5.0, 18.5) letters (CRVO) and +10.4 (6.7, 14.1) letters (BRVO) at M24. From baseline, mean±SD CRT decreased by 275±260 µm (CRVO) and 163±149 µm (BRVO) at M12, and 297±230 µm (CRVO) and 157±166 µm (BRVO) at M24. Overall, the mean number of IVT-AFL injections was 3.9±1.2 by M6, 4.8±2.0 by M12, and 5.7±3.1 by M24. No cases of retinal vasculitis or intraocular inflammation, including endophthalmitis, were reported.

Conclusions:

AURIGA was the largest study to evaluate IVT-AFL treatment of RVO in routine clinical practice globally. In Italy, treatment-naïve patients with RVO achieved clinically relevant and durable improvements that were maintained over 24 months of IVT-AFL treatment. The safety profile of IVT-AFL was consistent with that observed in previous studies.

Abstract 205

SEVERE RETINAL VASCULITIS ACCOMPANIED WITH ACUTE MIDDLE MACULOPATHY IN SYSTEMIC LUPUS ERYTHEMATOSUS.

Poster

Gartaganis P.*, Evangelos T., Giannakis I.

251 Hellenic Airforce General Hospital ~ Athens ~ Greece

Purpose:

To report the clinical and imaging features of a case of a severe retinal vasculitis accompanied with acute middle maculopathy in systemic lupus erythematosus.

Methods:

This observational case report includes an 18-year old female who was diagnosed with acute onset of Lupus vasculitis with multiple organ involvement and was referred to our ophthalmic department due to CNS involvement (Posterior Reversible Encephalopathy Syndrome – PRES) with cognitive and visual symptoms. A complete ophthalmological examination was performed, which included slit-lamp examination, fundoscopy, visual fields, and imaging with OCT, OCTA, and autofluorescence.

Results:

At presentation, the visual acuity was 20/20 without correction and despite there was no appearance of symptoms from the eyes, careful observation of the Multicolor OCT image in both eyes showed retinal findings including vascular tortuosity, retinal vasculitis, arteriolar narrowing, arteriovenous crossing changes, macular pigmentary mottling without any retinal findings in the 7-line OCT image. Pathological with related alterations were also the patient's visual fields.

Conclusions:

We present a case of severe lupus retinal vasculitis associated with paracentral acute middle maculopathy at the time of diagnosis using multimodal imaging techniques. The results imply that patients should undergo a thorough eye examination following a diagnosis, regardless of any visual problems.

Abstract 158

RISK OF RETINAL VEIN OCCLUSION FOLLOWING COVID-19 VACCINATION: A SELF-CONTROLLED CASE SERIES

Oral

Pellegrini M.*[1], Carnevali A.[2], Fiore T.[4], Fontana L.[3], Bacherini D.[5], Mura M.[1]

[1]University of Ferrara ~ Ferrara ~ Italy, [2]University Magna Graecia of Catanzaro ~ Catanzaro ~ Italy, [3]IRCCS Azienda Ospedaliero-Universitaria di Bologna ~ Bologna ~ Italy, [4]University of Perugia ~ Perugia ~ Italy, [5]Careggi University Hospital ~ Florence ~ Italy

Purpose:

Recently, there have been anecdotal reports of retinal vein occlusion (RVO) following COVID-19 vaccination. The purpose of this study was to evaluate the potential association between COVID-19 vaccination and RVO.

Methods:

This multicenter self-controlled case series included patients with RVO seen in five tertiary referral centers in Italy. All adults who received at least one dose of the BNT162b2, ChAdOx1 nCoV-19, mRNA-1273 or Ad26.COV2.S vaccine and had a first diagnosis of RVO between January 01, 2021, and December 31, 2021 were included. Incidence rate ratios (IRRs) of RVO were estimated using Poisson regression, comparing rates of events in a 28-day period following each dose of vaccination and in the unexposed control periods.

Results:

210 patients were included in the study. No increased risk of RVO was observed after the first dose (1-14 days IRR: 0.87, 95% CI: 0.41-1.85; 15-28 days IRR: 1.01, 95% CI: 0.50-2.04; 1-28 days IRR: 0.94, 95% CI: 0.55-1.58) and second dose of vaccination (1-14 days IRR: 1.21, 95% CI: 0.62-2.37; 15-28 days IRR: 1.08, 95% CI: 0.53-2.20; 1-28 days IRR: 1.16, 95% CI: 0.70-1.90). No association between RVO and vaccination was found in subgroup analyses by type of vaccine, gender and age.

Conclusions:

This self-controlled case series found no evidence of an association between RVO and COVID-19 vaccination. The apparent temporal relationship between vaccination and RVO may not represent a causative association.

Abstract 66

COMPARISON OF RETREATMENT RATES BETWEEN BEVACIZUMAB, RANIBIZUMAB, AFLIBERCEPT AND LASER FOR RETINOPATHY OF PREMATURITY

Poster

Chang E.*[1], Josan A.[2], Purohit R.[1], Patel C.[1], Xue K.[2]

[1]Oxford Eye Hospital, Oxford University Hospitals NHS Foundation Trust, Oxford, UK ~ Oxford ~ United Kingdom, [2]Nuffield Laboratory of Ophthalmology, Nuffield Department of Clinical Neurosciences, University of Oxford, Oxford, UK ~ Oxford ~ United Kingdom

Purpose:

Intravitreal anti-VEGF agents are increasingly used as primary therapy for retinopathy of prematurity (ROP), particularly for posterior disease, but late disease recurrence requiring further treatment can occur which requires intensive monitoring. Head-to-head comparisons of retreatment rates between bevacizumab, ranibizumab, aflibercept, and laser are lacking.

Methods:

We conducted a comprehensive literature search for randomised controlled trials and non-randomised comparative studies that used bevacizumab, ranibizumab, aflibercept or laser for ROP. Studies were evaluated by GRADE framework and those with biased case selection, non-randomised case-control, or lack of control group were excluded. Frequentist meta-analyses of proportions were performed to determine the absolute primary retreatment rate of each therapeutic modality followed by Bayesian network meta-analyses comparing pairs of treatments in type 1 ROP and Zone I ROP.

Results:

30 studies (comprising 4686 eyes) were included for network meta-analysis. Laser was associated with a significant 62% (95% CrI:16-83) reduction in retreatment risk compared with ranibizumab for type 1 ROP. Bevacizumab was associated with a significant 67% (95% CrI: 10-90) reduction in retreatment risk compared with laser for Zone 1 ROP. The mean time to retreatment following primary aflibercept (12.96 weeks±0.47 SEM) and bevacizumab (11.36±0.54 SEM) were significantly longer than ranibizumab (9.29±0.43 SEM) for type 1 ROP (p=7E-07 and p=9E-03, respectively).

Conclusions:

Laser was associated with a lower rate of retreatment than ranibizumab in type 1 ROP, while bevacizumab was associated with lower rate of retreatment than laser in Zone I ROP. The differences in timing of ROP recurrence between anti-VEGF agents could help to optimise monitoring regimes.

Abstract 36

NEW ARTIFICIAL INTELLIGENCE ANALYSIS FOR PREDICTION OF LONG-TERM VISUAL IMPROVEMENT AFTER EPIRETINAL MEMBRANE SURGERY.

Oral

Crincoli E.*[1], Savastano M.C.[1], Savastano A.[1], Caporossi T.[1], Bacherini D.[2], Miere A.[3], Gambini G.[1], De Vico U.[1], Baldascino A.[1], Minnella A.M.[1], Scupola A.[1], D''Amico G.[1], Molle F.[1], Bernardinelli P.[1], De Filippis A.[1], Kilian R.[4], Rizzo C.[5], Ripa M.[1], Ferrara S.[1], Scampoli A.[1], Brando D.[1], Molle A.[1], Souied E.H.[3], Rizzo S.[1]

[1]Policlinico Agostino Gemelli ~ Rome ~ Italy, [2]Università di Firenze ~ Firenze ~ Italy, [3]Hôpital Intercommunal de Creteil ~ Paris ~ France, [4]Università di Verona ~ Verona ~ Italy, [5]Università di Pisa ~ Pisa ~ Italy

Purpose:

To predict improvement of best corrected visual acuity (BCVA) 1 year after pars plana vitrectomy (PPV) for epiretinal membrane (ERM) using artificial intelligence (AI) methods on optical coherence tomography (OCT) B-scan images

Methods:

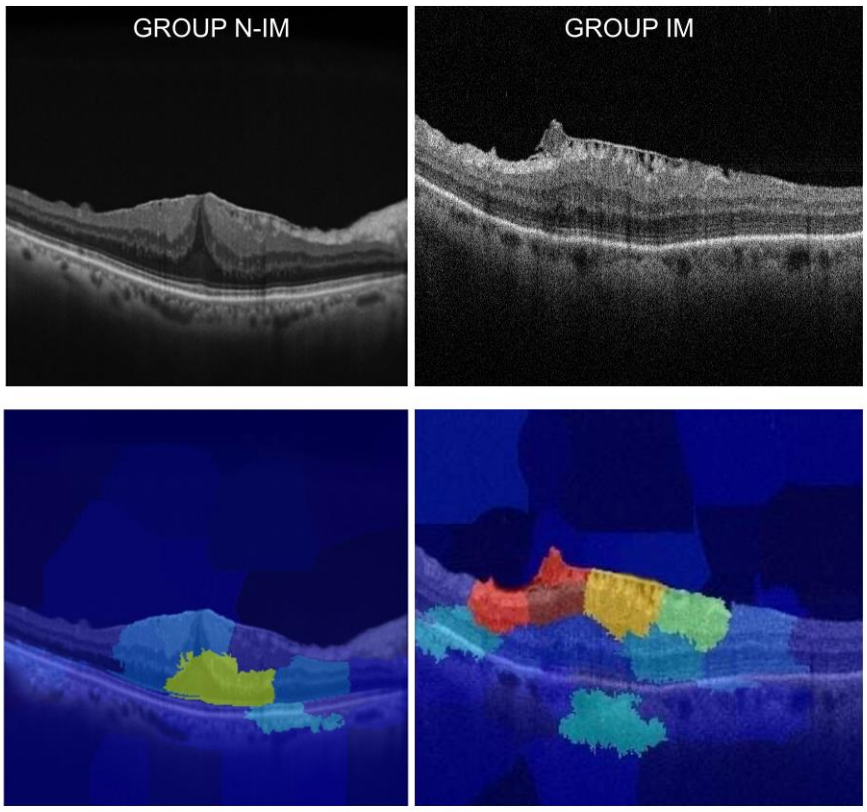
Four-hundred eleven(411) patients with stage II ERM were divided in a group improvement (IM)(≥ 15 ETDRS letters of VA recovery) and a group no improvement (N-IM)(<15 letters)according to 1-year VA improvement after 25 G PPV with internal limiting membrane(ILM) peeling. Primary outcome was the creation of a deep learning classifier(DLC) based on OCT B-scan images for prediction. Secondary outcome was assessment of the influence of various clinical and imaging predictors on BCVA improvement.Inception-ResNet-V2 was trained using standard augmentation techniques.Testing was performed on an external dataset.For secondary outcome, B-scan acquisitions were analyzed by graders both before and after fibrillary changes(FC) processing-enhancement.

Results:

The overall performance of the DLC showed a sensitivity of 87.3% and a specificity of 86.2%. Regression analysis showed a difference in preoperative images prevalence of ectopic inner foveal layer (EIFL), foveal detachment, ellipsoid zone (EZ) interruption, cotton wool sign, unprocessed FC (OR=2.75(CI 2.49-2.96)) and processed FC (OR=5.42(CI 4.81-6.08)) while preoperative BCVA and central macular thickness (CMT) didn’t differ between groups.

Conclusions:

The DLC showed high performances in predicting 1-year visual outcome in ERM surgery patients. FC should also be considered as relevant predictors.


GROUP N-IM
GROUP IM

Abstract 221

COMBINED SURGERY OF PHACOEMULSIFICATION, VITRECTOMY AND IMPLANTATION OF AHMED'S VALVE IN THE TREATMENT OF NEOVASCULAR GLAUCOMA

Oral

Zlatanovic M.*, Brzakovic M., Živkovic M., Hristov A., Zlatanovic N.

Eye Hospital Klinika Maja ~ Niš ~ Serbia

Purpose:

Neovascular glaucoma caused by diabetic retinopathy is a complication that leads to blindness. Often endophotocoagulation of the retina is neither feasible nor sufficient. Eye pathology tends towards rapid progression, so in eyes with preserved visual potential immediate intervention, phacoemulsification with vitrectomy and implantation of Ahmed's valve is required.

Methods:

The results of 18 eyes treated for neovascular glaucoma, caused by diabetic retinopathy but still with preserved visual potential, are presented. In all eyes, at the first examination, decompensated neovascular glaucoma was diagnosed with visual acuity from light perception to 0.1. The chosen method of treatment is a combined operation, phacoemulsification with 25g 4-port vitrectomy, extended panretinal endolaserphotocoagulation and Ahmed's valve implantation. Intraocular pressure and visual acuity are messured on the day of the first visit, the first control, and after 7, 30, 90 days . The data were statistically processed and the results presented using the Microsoft Excel program.

Results:

The obtained results indicate a significant reduction of intraocular pressure by 58% with a standard deviation of +/-14 already at the first control without added postoperative antiglaucoma therapy in relation to the preoperative value. At subsequent controls, the intraocular pressure values were stabilized at an average value of 17 mmHg with a standard deviation of +/-3 mmHg without added antiglaucoma therapy. The results also indicate a significant improvement in visual acuity up to 4 lines on the Snellen charts.

Conclusions:

Based on the presented results, it is concluded that the method of combined surgery in neovascular glaucoma of eyes with preserved visual potential is the method of choice. Combined phacoemulsification with 25g 4-port vitrectomy, extended panretinal endolaserphotocoagulation and Ahmed's valve implantation is solution with excellent results.

Abstract 131

COMPLICATIONS OF COMBINED VITRECTOMY AND PHACOEMUSLFICATION IN VITRECTOMY FOR DIABETIC RETINOPATHY

Oral

Alakeely A.*[1], Mura M.[2]

[1]Magrabi ~ Riyadh ~ Saudi Arabia, [2]King Khaled Eye Specialist Hospital ~ Riyadh ~ Saudi Arabia

Purpose:

Combining vitrectomy with phacoemuslfication allows faster visual recovery and enhance cost effectiveness. However, intraoperative and postoperative complications are more likely to occur especially in diabetic patients. Our purpose is to report the complications of phacoemuslfication in combination with vitrectomy for in diabetic vitrectomy.

Methods:

We searched operative records for of 1341 PPV for Diabetic vitrectomy. We reviewed patients records for preoperative characteristics, indications of surgery, the use of preoperative Anti-Vascular Endothelial Growth Factor agents, surgical technique used, Gauge size, type of tamponade, the inclusion of cataract surgery, the rate of complications and visual outcomes.
We included patients who had surgeries from January 2010 until December 2016. Exclusion criteria was indications not related to diabetic retinopathy, short follow up and incomplete documentation.
Visual acuity was recorded in the first postoperative visit and 6 months after the surgery or after Removal of Silicon Oil.

Results:

In total out of 1341 PPV for Diabetic vitrectomy only 289 (21.6%) underwent combined Phacoemulsification.
Cataract surgery related complications with a rate of 13.8% (40 of 289 cataract surgeries) divided into Posterior capsular rupture (PCR), nuclear fragments drop in the vitreous cavity, Aphakia, hyphema and persistent postoperative high IOP.
Overwhelmingly most complications occurred in vitreous hemorrhage 76% cases followed by tractional retina detachment 9%. Of the 39 cases of PCR 5 eyes were left Aphakic Only one patient who was reported to have active Neovascularization of the iris developed postoperative hyphema.

Conclusions:

Combining phacoemulsification and Vitrectomy for coexisting cataract and Diabetic retinal pathologies has high rate of complication compared to routine cataract surgery. However, these complications are typically managed intraoperativly and yield favorable outcome. We believe that accounting for the financial and patients satisfaction the benefits overweights the risks.

Abstract 113

POSTOPERATIVE COMPLICATIONS OF COMBINED PHACOEMULSIFICATION AND PARS PLANA VITRECTOMY IN DIABETIC RETINOPATHY PATIENTS

Oral

Barayev E.*[1], Gershoni A.[1], Jbara D.[1], Axer--Siegel R.[1], Dotan A.[1], Gal--Or O.[1], Tuuminen R.[2], Ehrlich R.[1]

[1]Rabin Medical Center ~ Petah Tikva ~ Israel, [2]University of Helsinki ~ Helsinki ~ Finland

Purpose:

To compare intra- and postoperative complications in combined phacoemulsification and pars plana vitrectomy surgeries performed in patients with non-proliferative diabetic retinopathy (NPDR) versus proliferative diabetic retinopathy (PDR).

Methods:

Retrospective, case series of patients with diabetic retinopathy who underwent combined phacovitrectomy surgery between 2008 and 2017. We compared intraoperative complications including posterior capsular rupture and retinal tear, and postoperative complications including corneal edema, macular edema (ME), epiretinal membrane (ERM), neovascular glaucoma and persistent inflammation.

Results:

A total of 104 eyes of 104 patients were included in this study. 24 eyes (23.1%) were categorized as NPDR and 80 eyes (76.9%) as PDR. The most common intraoperative complication was retinal tear (8% in NPDR and 19% in PDR, p=0.195) and postoperative complication was ME (29% in NPDR and 26% in PDR, p=0.778). There were no statistically significant differences in intra- and postoperative complication rates between the NPDR and PDR groups, even after adjusting for confounders; patient age at surgery and indication for surgery.

Conclusions:

After combined phacovitrectomy in NPDR and PDR patients, new-onset ME was found in about a quarter of eyes in both groups. Intraoperative anti-VEGF or steroid administration, and intense postoperative anti-inflammatory medication and follow-up should be regarded after phacovitrectomy regardless of the DR level.

Abstract 112

POSTOPERATIVE OUTCOMES OF IDIOPATHIC EPIRETINAL MEMBRANE ASSOCIATED WITH INTRARETINAL CYSTOID SPACES WITH OR WITHOUT PREOPERATIVE LEAKAGE ON FA

Oral

Heloise T.*, Marion L., Elise P., Ramin T., Alain G., Aude C.

University Paris Cite ~ Paris ~ France

Purpose:

To analyze the postoperative outcomes of epiretinal membrane (ERM) associated with intraretinal cystoid spaces with or without leakage on fluoresceine angiography (FA).

Methods:

A retrospective study of all consecutive eyes operated for primary ERM over a 5-year period was conducted. The presence of intraretinal cystoid spaces was assessed on the preoperative optical coherence tomography (OCT) B-scan in all eyes. Highly myopic eyes were excluded. Postoperative characteristics of eyes with leakage on FA were compared to those without leakage.

Results:

Of 945 eyes with primary ERM, 239 had intraretinal cystoid spaces (prevalence of 26%). A total of 40 eyes imaged preoperatively with FA were included. On preoperative FA, a leakage was observed in 51% of eyes. After a mean follow-up of 12.8 months, the cystoid spaces had resolved in 54% of eyes, and this rate was similar in eyes with versus without leakage (44% vs 65% p =0.2). The postoperative VA and CMT did not differ between eyes with or without leakage. A higher rate of postoperative macular edema was observed in the eyes with leakage compared without leakage.

Conclusions:

In a series of 40 eyes with idiopathic ERM and cystoid spaces, preoperative FA showed leakage in 51% of eyes. After peeling, eyes with leakage had functional outcomes similar to those without leakage. However, leakage on preoperative FA was associated with a higher risk of postoperative macular edema.

Abstract 3

MEMBRANE BLUE DUAL PROTECTS RETINAL PIGMENT EPITHELIUM CELLS AND GANGLION CELLS CULTURED IN BOTH PHYSIOLOGIC CONDITIONS AND IN THE PRESENCE OF UVB THROUGH THE MODULATION OF THE MITOCHONDRIAL FUNCTION AND OF THE REDOX BALANCE

Oral

Grossini E.*, Venkatesan S., Garhwal D., Toma C., De Cillà S.

University East Piedmont ~ Novara ~ Italy

Purpose:

We examined the effects of Membrane Blue-Dual (MBD) with/without polyethylene glycol (PEG) on both human retinal pigment epithelial (ARPE-19) and retinal ganglion (RGC-5) cells cultured in the presence/absence of ultraviolet B (UVB) treatment on viability, mitochondrial function, oxidants/antioxidants, proliferation/migration and apoptosis.

Methods:

In ARPE-19/RGC-5 cells either treated or not with UVB, the effects of MBD with/without PEG were evaluated by specific assays for viability, mitochondrial membrane potential and mitochondrial reactive oxygen species (mitoROS) release. Annexin V was used to detect apoptosis, whereas trypan blue and the scratch assay were used for proliferation/migration evaluation. Finally, through Western blot, we analyzed the superoxide dismutase (SOD) 2 and the nuclear protein ki67 expression.

Results:

In both physiologic condition and in the presence of UVB, MBD with/without PEG increased viability, mitochondrial membrane potential, proliferation and migration of both ARPE-19 and RGC-5 cells. In general, the effects of MBD with PEG were higher than those caused by MBD without PEG. In particular, in the presence of UVB, we could find a greater improvement of cell viability, mitochondrial membrane potential and SOD2 expression and a stronger reduction of mitoROS release and apoptosis in both ARPE-19 and RGC-5 cells treated with the dye additioned with PEG. Examples of effects of MBD on ARPE-19 are shown in attached figure.

Conclusions:

Our results suggest that in particular MBD with PEG is a safe and effective dye for vitro-retinal surgery through the modulation of mitochondrial function and the oxidants/antioxidants balance. The data we obtained may add new knowledge about the use of MBD and could be relevant for the clinical use.

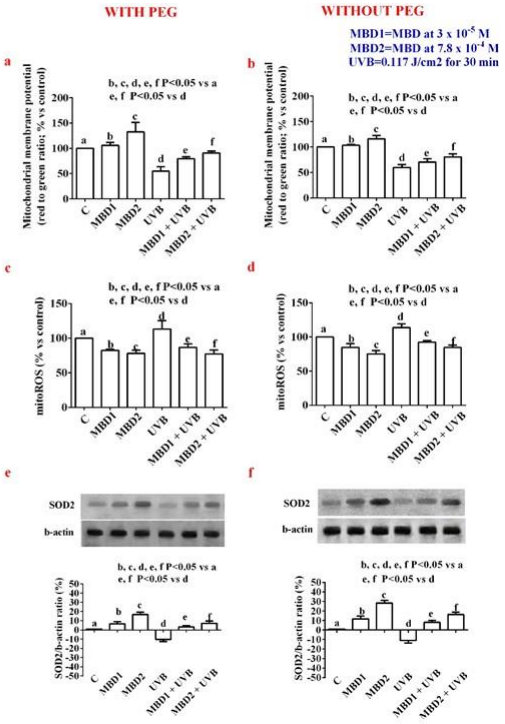


Figure shows the effects of MBD with PEG (a, c, e) and without PEG (b, d, f) on ARPE-19 cells.
In a and b, mitochondrial membrane potential
In c and d, mitochondrial ROS release
In e and f, SOD2 expression
The results are the mean ± SD of repeated experiments

Abstract 50

REFRACTIVE OUTCOME IN COMBINED PHACOVITRECTOMY: ANTERIOR SEGMENT OCT ASSESSMENT AND CORRECTIVE FACTOR FOR IOL POWER CALCULATION IMPROVEMENT

Oral

Crincoli E.[1], Savastano A.[1], Ferrara S.*[1], Caporossi T.[1], Miere A.[2], Souied E.H.[2], Savastano M.C.[1], Kilian R.[3], Rizzo C.[4], Rizzo S.[1]

[1]Ophthalmology Unit, "Fondazione Policlinico Universitario A. Gemelli IRCCS", Rome, Italy ~ ROME ~ Italy, [2]Department of Ophthalmology, Centre Hospitalier Intercommunal de Créteil ~ Paris ~ France, [3]Ophthalmology Unit, University of Verona, Verona, Italy ~ Verona ~ Italy, [4]Ophthalmology, Department of Surgical, Medical and Molecular Pathology and Critical Care Medicine, University of Pisa, Pisa, Italy ~ Pisa ~ Italy

Purpose:

To analyze differences in refractive outcome Delta (difference between postoperative and expected refractive error) and in anterior segment changes between cataract surgery patients and combined phacovitrectomy patients. We also aimed to provide a corrective formula allowing to minimize the refractive outcome Delta in combined surgery patients.

Methods:

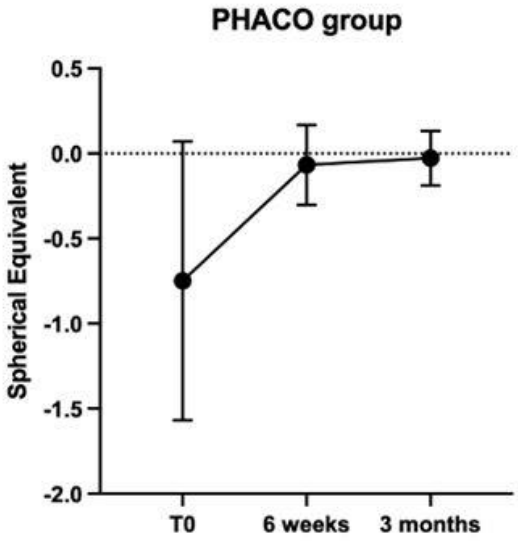
Candidates for phacoemulsification and combined phacovitrectomy (respectively PHACO and COMBINED groups) were prospectively enrolled in two specialized centers. Patients underwent best corrected visual acuity (BCVA) assessment, ultra-high speed anterior segment optical coherence tomography (OCT), gonioscopy, retinal OCT, slit lamp examination and biometry at baseline, 6 weeks postoperatively and 3 months postoperatively.

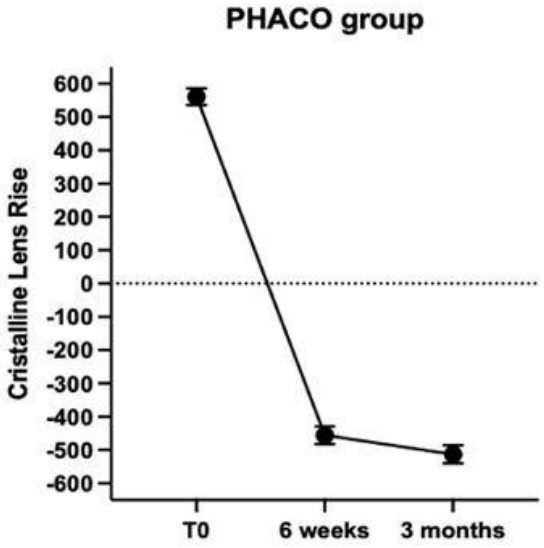
Results:

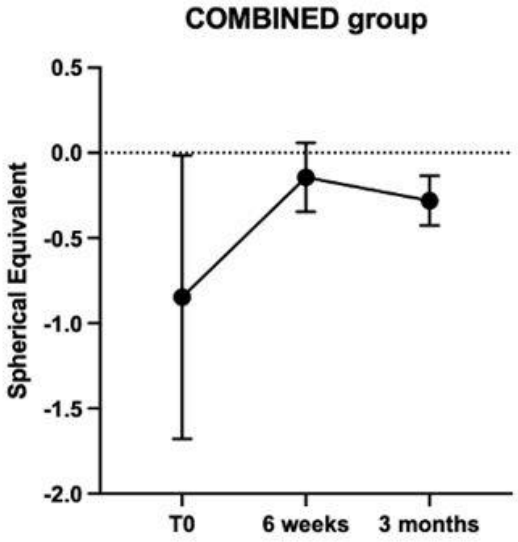
No differences in refractive Delta, refractive error and anterior segment parameters were noted between PHACO and COMBINED group (109 and 110 patients respectively) at 6 weeks. At 3 months, COMBINED group showed a spherical equivalent of -0.29 ± 0.10 D versus -0.03 ± 0.15 D in PHACO group (p=0.023). COMBINED group showed a significantly higher Crystalline Lens Rise (CLR), angle-to-angle (ATA) and anterior chamber width (ACW) and a significantly lower anterior chamber depth (ACD) and refractive Delta with all 4 considered formulas at 3 months. For IOL power lower than 15, a hyperopic shift was observed instead.

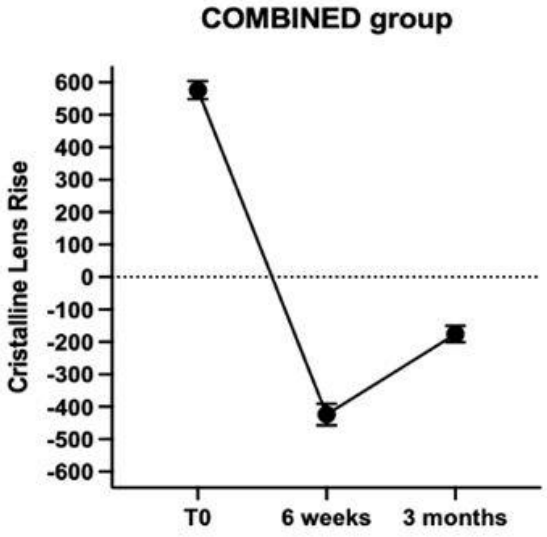
Conclusions:

Anterior segment OCT suggests anterior displacement of the effective lens position in patients undergoing phacovitrectomy. A corrective formula can be applied to IOL power calculation to minimize undesired refractive error.


PHACO group
Spherical Equivalent
0.5
0.0
-0.5
-1.0
-1.5
-2.0
T0
6 weeks
3 months


PHACO group
Cristalline Lens Rise
600
500
400
300
200
100
0
-100
-200
-300
-400
-500
-600
T0
6 weeks
3 months


COMBINED group
Spherical Equivalent
0.5
0.0
-0.5
-1.0
-1.5
-2.0
T0
6 weeks
3 months


COMBINED group
Cristalline Lens Rise
600
500
400
300
200
100
0
-100
-200
-300
-400
-500
-600
T0
6 weeks
3 months

Abstract 25

FOVEAL AVASCULAR ZONE AREA CHANGES AND OCT ANGIOGRAPHY AFTER 27 G PARS PLANA VITRECTOMY FOR IDIOPATHIC EPIRETINAL MEMBRANE

Oral

Stamenkovic M.*[1], Vukadinovic B.[1], Popovic A.[1], Milic J.[2], Jevtic A.[1], Nikitovic N.[1], Jaksic V.[1], Zikic Z.[1], Plavsic M.[1], Sukalo S.[1], Mavija M.[3]

[1]Eye Clinic University Medical Center "Zvezdara" ~ Belgrade ~ Serbia, [2]Eye Clinic Clinical Center Montenegro ~ Montenegro ~ Montenegro, [3]Eye Clinic Clinical Center Banja Luka ~ Banja Luka ~ Bosnia and Herzegovina

Purpose:

The present study aimed to assess the feasibility and safety of 27G pars plana vitrectomy, for idiopathic epiretinal membrane by investigation of foveal avascular zone (FAZ) after surgery, and to evaluate the correlation between FAZ and visual outcomes using optical coherence tomography angiography, in post–vitrectomized eyes.

Methods:

This retrospective case-control study included 11 eyes (11 patients) with IERM, that were successfully removed with a pars plana vitrectomy 27G (air tamponade), as uncomplicated surgical procedure. The changes of FAZ were examined by OCTA after surgery. The FAZ area was investigated with OCT angiography in the superficial capillary plexus and deep capillary plexus. The unaffected fellow eye was used as a control group.

Results:

Reduction in sperficial FAZ area size were significantly in IERM group (superficial: 101.298 ± 77.516 μm) following surgery. Reduction in the deep FAZ area was also markedly in the IERM group(91.247 ± 79.027 μm).
FAZ area of the affected eye was significantly smaller than that of the healthy fellow eye and negatively correlated with postoperative BCVA.

Conclusions:

Reduction in the FAZ area size after successful surgical removed ERM may indicate that there is more ischemic damage to retinal capillary plexus in fovea. The results of our study indicate that 27G PPV with ILM peeling is minimally invasive for IERM and reliable postoperative BCVA recovery.

Abstract 171

SURGICAL MANAGEMENT OF EPIRETINAL MEMBRANE WITH WIDE RETINAL FIBROSIS SECONDARY TO OCULAR TOXOPLASMOSIS: A CASE REPORT

Oral

Pacini B.*[1], Dragotto F.[2], Piergentili M.[2], Santini F.[1], Barca F.[1]

[1]Piero Palagi Hospital ~ Florence ~ Italy, [2]University of Florence ~ Florence ~ Italy

Purpose:

To describe a surgical case of an epiretinal macular membrane (ERM) associated with a wide fibrosis involving the posterior pole and the peripheral retina, secondary to toxoplasmosis chorioretinitis and vasculitis.

Methods:

A 40 yo Nigerian man was referred to the ophthalmology department of Piero Palagi hospital for a monolateral thickened macular pucker with a wide epiretinal fibrosis, associated to multiple pigmented chorioretinal scars on the temporal side of the macula and signs of previous vasculitis without any sign of current inflammation. A preliminary diagnosis of toxoplasmosis infection was made based on the clinical findings. Antibiotic prophylactic therapy was prescribed. A lens sparing pars plana vitrectomy with ERM peeling without air tamponade and with a collection of the vitreous sample for parasite testing was performed. Patient's blood was drawn for serological testing.

Results:

Vitreous sample analysis did not confirm any parasitic infection; serological tests confirmed previous toxoplasmosis infection. At 3 months the BCVA of this patient slightly improved. A repeat Spectral-domain optical coherence tomography (SD-OCT) test showed a reduction in central macular thickness.

Conclusions:

Ocular toxoplasmosis infection could have heterogeneous clinical ocular manifestations, one of these could be a wide epiretinal fibrosis. Vitrectomy combined with ERM peeling is an effective treatment for ERM secondary to ocular toxoplasmosis; gas endotamponade could be avoided to prevent further vitreal inflammation and retinal contractions.

Abstract 94

SUBRETINAL GENE THERAPY: SURGICAL PEARLS

Oral

Šaric B.*, Bosnar D., Markovic L., Mirjana B., Bušic M., Varošanec A.M.

University Hospital "Sveti Duh" ~ Zagreb ~ Croatia

Purpose:

To date, there is little experience in surgical practice with VN(voretigene neparvovek) in treatment of RPE65-IRD. Herein, we present surgical challenges in treating the first twenty-three patients with RPE65-IRD treated with VN at the University Eye Department of the University Hospital „Sveti Duh“, Zagreb, Croatia.

Methods:

Twenty-three patients with RPE65-IRD were treated with VN. Patients underwent pars plana vitrectomy (PPV) with subretinal VN application. 20 patients with RPE65-IRD on both eyes, and three patients with RPE65-IRD on one eye were treated by a subretinal application of VN. The patients were aged from 6 to 66 years of age. All patients were diagnosed with bialelic RPE65 mutation prior to the treatment. In total 10 patients were from Croatia, and 13 patients were referred from other countries within the EU.

Results:

The critical step of pars plana vitrectomy with VN instillation is the subretinal bleb formation. To achieve successful subretinal bleb formation, in some cases, there are additional steps to be made. As described, in some patients that were blood relatives, repeated staining with preservative-free triamcinolone acetonide to achieve PVD induction was needed due to the structure and consistency of the vitreous. Before entering the subretinal space, due to the resistance of the ILM, localized ILM-peeling was performed. In order to surround the macular area, multiple bleb formation was necessary.

Conclusions:

43 subretinal surgeries were performed by a two-surgeon team. Key anatomical features pertinent to surgical management were noted. Surgical decisions important- for successful subretinal administration of viral vectors and management of potential surgical challenges were formulated.

Abstract 203

COMPARATIVE STUDY OF COMMONLY USED INTRAOCULAR FORCEPS

Oral

Dogramaci M.*

Princess Alexandra Hospital NHS trust ~ Halow ~ United Kingdom

Purpose:

To establish the subtle differences in performance, accuracy, precision, and safety of three commonly used intraocular forceps tip designs and compare their effectivity and safety margins.

Methods:

Internal limiting membrane pinch peeling procedure was modelled using a purpose-built robotic system with a biomimetic membrane resembling retinal layers. Perforation pressure through excessive denting, dent versus lift curve, maximum lift and safety ranges for 27-gauge Eckardt End-Gripping, 27-gauge Katalyst stiff Dex and a 27 gauge Ultrapeel forceps were compared.

Results:

Perforation pressure through excessive denting was 15.85, 15.48 and 16.01 mg for Eckart, Katalyst and Ultra-peel forceps. Dent versus lift curve showed an initial positive then a plateau and finally a negative correlation. Maximum lift was 15.29, 8.43 and 11.13 mg for Eckart, Katalyst and Ultra-peel. The minimum dent to achieve the maximum lift was 1.10, 10.42 and 0.97mg for Eckart, Katalyst and ultra-peel. The safety range was 14.75, 5.06 and 15.04 mg for Eckart, Katalyst and ultra peel.

Conclusions:

Forceps tip design has significant influence on its overall performance and safety. Manufacturers should be encouraged to provide detailed and objective data in relation to the performance of their designs to enhance safety and ensure appropriate usage. Currently no objective data is being provided by any forceps manufacturers.

Abstract 37

TREATMENT OF RECURRENT HIGH MYOPIC MACULAR HOLE AND ASSOCIATED RETINAL DETACHMENT WITH HUMAN AMNIOTIC MEMBRANE

Oral

Carlà M.M.*[1], Caporossi T.[1], Baldascino A.[1], Gambini G.[1], De Vico U.[1], Scampoli A.[1], Ripa M.[1], Governatori L.[2], Rizzo S.[1]

[1]Ophthalmology Unit, "Fondazione Policlinico Universitario A. Gemelli IRCCS", Rome, Italy ~ Rome ~ Italy, [2]Department of NEUROFARBA, Ophthalmology, University of Florence, Careggi, 50134 Florence, Italy. ~ Florence ~ Italy

Purpose:

To determine the efficacy of the human amniotic membrane to close macular hole retinal detachment in high myopic eyes.

Methods:

We collected 19 high myopic eyes of 19 patients affected by macular hole retinal detachment who had already undergone vitrectomy with internal limiting membrane peeling. Patients underwent vitrectomy with amniotic membrane transplantation.

Results:

A primary success rate of 89.5% (17 of 19 eyes) was achieved after 3 months, and final macular hole closure was obtained in 18 of 19 eyes (94.7 %). The final retinal reattachment rate was 100%. The final 12-month mean BCVA improved from 20/2000 (2 logMAR) to 20/250 (1.1 logMAR). OCT-angiography revealed a high correlation between superficial and deep capillary plexus density and final BCVA.

Conclusions:

HAM patch is an efficient substrate to manage macular hole retinal detachment in high myopic eyes, resulting in encouraging anatomical results and BCVA recovery.

Abstract 83

EFFICACY OF AUTOLOGOUS PURE PLASMA RICH IN PLATELET (P-PRP) FOR THE TREATMENT OF LARGE FULL-THICKNESS MACULAR HOLES

Oral

Aurelio I.[1], Lo Giudice G.[1], Anastasi M.*[2], Pioppo A.[1]

[1]Ophthalmic Unit, Civico and Benfratelli Hospital, Palermo ~ Palermo ~ Italy, [2]Ophthalmic Unit, Department of Neurosciences, Biomedicine and Movement Sciences, University of Verona, Verona, Italy ~ Verona ~ Italy

Purpose:

To compare closure rates (CR), uncorrected (UCVA), best-corrected visual acuity (BVCA), and Ellipsoid zone reconstruction, after a single vitreoretinal inverted flap fill technique (IFFT) in 2 groups of patients with macular hole stage IV, with or without pure plasma rich in platelet injection (P-PRP).

Methods:

This is a non-randomized consecutive retrospective clinical study of 40 patients with full-thickness idiopathic macular hole stage IV. All cases were examined and treated between January 2021 and April 2022 at the ARNAS Civico Di Cristina Benfratelli Hospital and Paolo Giaccone University Hospital in Palermo. The patients were divided into two groups: the P-PRP group and the NP-PRP group, both of 20 patients each. Either group underwent a 25G IFFT, but the first received the P-PRP, assisted by intra-operative optical coherence tomography, to fill the holes. All patients received at least 6m of follow-up.

Results:

We analyzed 40 patients (average age 64) with stage IV macular holes. In the P-PRP group, the mean minimum hole opening measured on average 670.65 ± 206.99 while in NP-PRP was 496 ± 120.38 ($p<0.0056$). The macular holes were closed in 88% of cases. No statistically significant difference in closure rates and BCVA between groups was found ($p<0.1193$;$p<0.2698$). Statistically better results in reestablishing od Ellipsoid zone were found in the P-PRP group ($p <0.1193$,$t = 1.5938$). Compared to others, patients who showed a re-establishment of the Ellipsoid zone had a statistically significant visual improvement ($p<0,0007$)

Conclusions:

The addition of PRP in IFFT does not modify results in terms of VA and CR. But, considering the better restoration of the Ellipsoid zone in the P-PRP group despite P-PRP's greater hole dimension, a photoreceptor regenerative action could be hypnotized. In addition, P-PRP's sticky characteristics, help fulfil the procedure.

Abstract 90

INVERTED INTERNAL LIMITING MEMBRANE FLAP FOR SMALL-SIZED (<250 MICRON) FULL THICKNESS MACULAR HOLE: ANATOMICAL AND FUNCTIONAL OUTCOME

Oral

Iuliano L.*, Codenotti M., Bandello F.

IRCCS Ospedale San Raffaele Scientific ~ Milan ~ Italy

Purpose:

To compare the anatomical and functional outcome of small-sized (<250 micron) and medium-sized (250-400 micron) full thickness macular holes (FTMH) treated either with internal limiting membrane (ILM) inverted flap (IF) or with the standard technique.

Methods:

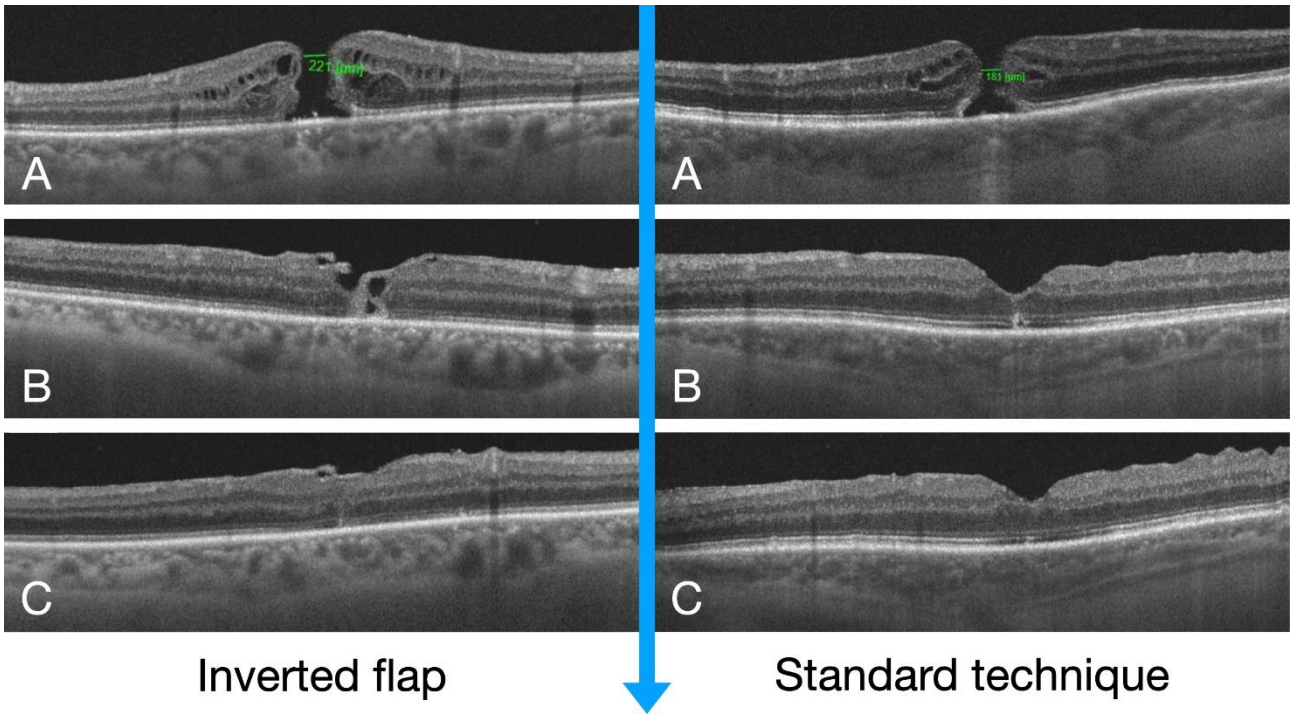
Prospective non-randomized analysis of subjects affected by small or intermediated FTMH followed for 6 months, operated either with IF or with the standard technique. Main outcome measures were best-corrected visual acuity (BCVA), macular retinal sensitivity (measured with microperimetry) and restoration of the external limiting membrane (ELM) and ellipsoid zone (EZ) at 6 months.

Results:

100 eyes were included, 50 with small and 50 intermediate FTMH. Half of each group (25) was treated with the standard technique, half with IF. BCVA increased in every subgroup, regardless the technique. In small FTMH the 4° retinal sensitivity at 1 month turned out to be inferior in the IF group (19.59+/-2.49 dB) compared to the standard technique (19.84+/-2.42 dB; p=0.0035). Small FTMH with IF disclosed inferior rates of ELM (24%) and EZ (24%) restoration, compared to the standard technique (56% ELM p=0.0420; 64% EZ p=0.0095). At 6 months, both microperimetric and anatomical parameters (ELM and EZ) were similar.

Conclusions:

Surgical repair of small-sized FMTH with ILM inverted flap achieves successful anatomical and functional results, comparable to the standard technique. ILM inverted flap in small FMTH may slow down the foveal microstructural repair compared to the standard technique.


A
A
B
B
C
C
Inverted flap
Standard technique

Abstract 49

AUTOLOGOUS ANTERIOR LENS CAPSULE FLAP AND SERUM TRANSPLANT IN MANAGING IDIOPATHIC AND REFRACTORY FULL THICKNESS MACULAR HOLES

Oral

Motta L.*[1], Ripa M.[2], De Rosa C.[3], De Rosa P.[4], Goh L.Y.[5], Mchugh D.[5]

[1]Department of Ophthalmology, William Harvey Hospital, East Kent Hospitals University NHS Foundation Trust ~ Ashford ~ United Kingdom, [2]Ophthalmology Unit, "Fondazione Policlinico Universitario A. Gemelli IRCCS" ~ Rome ~ Italy, [3]Eye Clinic, Public Health Department, University of Naples Federico II ~ Naples ~ Italy, [4]Department of Ophthalmology, A. Cardarelli Hospital ~ Naples ~ Italy, [5]Department of Ophthalmology, King's College Hospital NHS Foundation Trust ~ London ~ United Kingdom

Purpose:

To report the results of pars plana vitrectomy (PPV) with inner limiting membrane (ILM) peeling alongside phacoemulsification and intraocular lens (IOL) implantation with autologous anterior lens capsule flap (ALCF) and autologous serum transplantation (AST) into full thickness macular holes (FTMH) and 14% perfluoropropane (C3F8) tamponade for idiopathic and refractory FTMHs.

Methods:

Retrospective study involving eleven patients with idiopathic FMTHs and seven with refractory FMTHs after standard surgery with PPV, ILM peeling, and gas tamponade. All eyes underwent a 'combination procedure' of PPV with ILM peeling alongside phacoemulsification and IOL implantation with autologous ALCF and AST into the FTMH and 14% C3F8 tamponade. A face-down position for one week was recommended.

Results:

The mean preoperative FMTH size was 558.95 ± 186.30 µm. Seven patients aged 64 ± 5 years had a refractory FMTH and eleven patients with a mean age of 63.72 ± 4.97 years had an idiopathic FMTH. The main BCVA improvement six months postoperatively was 0.3 ± 0.29 logMAR. Seventeen macular holes fully closed six months postoperatively, with one FTMH closure failure because of a retinal detachment.

Conclusions:

ALCF transplantation alongside AST may help to improve the closure rate and visual outcomes in both idiopathic and refractory FMTHs.

Abstract 84

SUPERIOR INVERTED ILM FLAP WITHOUT PEELING OFF TECHNIQUE FOR THE TREATMENT OF LARGE MACULAR HOLE

Poster

Byon I.*, Kim J.

Pusan National University Hospital ~ Busan ~ Korea, Republic of

Purpose:

To evaluate the surgical outcomes of superior inverted internal limiting membrane (ILM) flap without peeling off technique for the treatment of large macular hole (MH). It was a modified technique of Perfluoro-n-Octane(PFO)-Assisted Single Layered inverted ILM flap

Methods:

Eight eyes with MH of 400 μm or greater were included in this retrospective interventional case series. The ILM flap stained by 0.025% BBG was made from the superior area of the hole. The ILM in the temporal, nasal, and inferior area around hole was not peeled off. The hole was gently covered using the inverted ILM flap which was stabilized using a small amount of PFO. The fluid air exchange was performed slowly. The residual PFO was removed by evaporation. The patients were instructed to maintain a facedown position for a day after the operation.

Results:

The average hole size was 613.8 ± 131.2 μm. Five eyes were idiopathic MH, one high myopia, one trauma, and one wet age-related macular degeneration. All eyes achieved the type I closure from 1 to 35 postoperative day. Foveal contour gradually improved during the follow-up period. The visual acuity improved from 1.12 to 0.70 logMAR unit.

Conclusions:

The superior inverted ILM flap without peeling off technique was easy for beginners to perform the large macular surgery achieving good anatomical and visual outcomes.

Abstract 48

COMPARISON OF PAIN EXPERIENCE IN PATIENTS UNDERGOING SUB-TENON'S ANAESTHESIA VERSUS PERIBULBAR ANAESTHESIA DURING ELECTIVE VITREORETINAL SURGERY

Oral

Ripa M.*[1], Schipa C.[2], Kopsacheilis N.[3], Nomikarios M.[4], De Rosa C.[6], De Rosa P.[5], Motta L.[4]

[1]Ophthalmology Unit, "Fondazione Policlinico Universitario A. Gemelli IRCCS" ~ Rome ~ Italy, [2]Department of Emergency, anesthesiological and reanimation sciences, Fondazione Policlinico Universitario A. Gemelli IRCCS ~ Rome ~ Italy, [3]East Kent Hospitals NHS Foundation Trust, Kent and Canterbury Hospital ~ Cantertbury ~ United Kingdom, [4]Department of Ophthalmology, William Harvey Hospital, East Kent Hospitals University NHS Foundation Trust ~ Ashford ~ United Kingdom, [5]Department of Ophthalmology, A. Cardarelli Hospital ~ Naples ~ Italy, [6]Eye Clinic, Public Health Department, University of Naples Federico II ~ Naples ~ Italy

Purpose:

To assess and compare the patients' discomfort and pain experienced during anaesthesia, pars plana vitrectomy (PPV), and 24 hours postoperatively following sub-Tenon's injection (STI) versus peribulbar block (PB) in elective vitreoretinal surgery.

Methods:

Retrospective study involving Eighty patients who underwent elective vitreoretinal surgery receiving either PB (group 1, n=40) or STI (group 2, n= 40) between January 2021 and March 2022. Patients' pain experienced during the procedure and 24 hours postoperatively were assessed using a pain scale and a two-section questionnaire. One hour postoperatively, patients were asked to rate the level of pain they felt during the entire procedure by pointing at a 0–100 Visual Analogue Scale (VAS). Subsequently, patients answered a two-section questionnaire regarding pain and discomfort felt 24 hours postoperatively.

Results:

According to VAS measurements, patients experienced significantly more pain during PB than during STI one hour after surgery. Patients undergoing PB experienced more pain than those who underwent STI, experiencing burning and discharge feeling. Patients undergoing STI had a lower pain level score 24 hours post-operatively despite similar discomfort.

Conclusions:

STI has a lower pain score than PB during the procedure and 24 hours postoperatively, representing a valuable procedure to deliver analgesia in vitreoretinal surgery.

Abstract 182

VITREOUS BIOPSY AND MACULAR CHORIORETINAL BIOPSY FOR DIFFERENTIATING VIRAL RETINITIS AND VITREORETINAL LYMPHOMA

Oral

Sabatino F.*[1], Muqit M.[2]

[1]Norfolk & Norwich University Hospitals NHS Foundation Trust ~ Norwich ~ United Kingdom, [2]Moorfields Eye Hospital NHS Foundation Trust ~ London ~ United Kingdom

Purpose:

To describe the role of vitreous and macular chorioretinal biopsy in differentiating viral retinitis and vitreoretinal lymphoma.

Methods:

A 56-year-old, profoundly immunosuppressed, HIV+ patient was referred by the Uveitis to the Vitreoretinal Service at Moorfields Eye Hospital reporting sudden painful blind left eye. Urgent pars plana vitrectomy (PPV), vitreous biopsy and intravitreal Foscarnet were performed for dense vitreitis. PPV with macular chorioretinal biopsy, endolaser and silicone oil was performed, given the lymphoma suspect, the distribution of the subretinal infiltrates in the macular area and the blind eye.

Results:

The immunocytochemistry of the vitreous sample revealed acute-on-chronic inflammatory findings. In particular, there were mostly CD3+ and CD5+ lymphocytes, but also scattered CD79a+, CD20 lymphocytes and CD68+ hyalocytes. The macular chorioretinal biopsy showed a chronic inflammatory cell infiltrate, predominantly composed by macrophages and T-cells, with only occasional CD20+ B-cells. The results were felt in line with suspect of a destructive, reactive process in keeping with viral retinitis.

Conclusions:

Vitreous and chorioretinal biopsy may support the differential diagnosis in atypical scenarios of severe retinitis in profoundly immunosuppressed HIV patient. Macular chorioretinal biopsy has a role in blind eye to support the diagnosis.

Abstract 47

EARLY-ONSET MYOPIA AND RETINAL DETACHMENT WITHOUT TYPICAL MICROCORIA OR SEVERE PROTEINURIA IN PIERSON SYNDROME DUE TO A NOVEL LAMB2 VARIANT

Poster

Magliyah M., Alshamrani A.*, Alsulaiman S.

King Khaled Eye Specialist Hospital ~ Riyadh ~ Saudi Arabia

Purpose:

Background: Pierson syndrome is a genetic disease first described as microcoria and congenital nephrotic syndrome that progresses to fatal renal failure. It results from mutations in the laminin B2 gene (LAMB2), one of the glycoproteins that are expressed in the basement membrane of glomeruli, ocular structures, and neuromuscular structures.

Methods:

Purpose:To describe the ocular and renal features as well as outcomes of retinal detachment repair in patients with a novel homozygous LAMB2 mutation.
Methods:The eyes, urine, and serum DNA were evaluated in the affected patients.
Results:Eleven patients (22 eyes) from 4 families with a mean age at presentation of 6.0 years (range 1 to 26 years) were included. All were confirmed to have a homozygous variant c.619T>C p.(Ser207Pro) in the LAMB2 gene. None of the study eyes had microcoria, and none of the patients had nephrotic range proteinuria. Seven patients were tested for proteinuria, and all demonstrated mild proteinuria <100 mg/dL

Results:

All patients had moderate to high axial myopia, with a mean refraction of -5.6 diopters(range -4.0 to -9.0 diopters). Among 15 eyes with clear view to the fundus, tessellated myopic fundus, avascular peripheral retina evident clinically or on fluorescein angiography, and rudimentary fovea were universal (100% of the eyes). Optic disc pallor was observed in 10 eyes(66.7%). Peripapillary atrophy was present in only 1 eye (6.7%). Straightened retinal vessels, abnormal vascular emanation from the optic disc, supernumerary vascular branching at the optic disc and vascular tortuosity were observed in 10 (66.7%), 2 (13.4%), 2 (13.4%), and 2 (13.4%) eyes respectively.

Conclusions:

Conclusions: This study describes a distinct phenotype of Pierson syndrome with a novel homozygous LAMB2 mutation and further expands the spectrum of ophthalmic and renal features, and molecular genetic basis of LAMB2-related disease. The retinal features may be the only clue to suspect the diagnosis.

Abstract 52

ASSESSMENT THE MORPHOLOGICAL STATE OF THE POSTERIOR CAPSULE IN POSTERIOR SUBCAPSULAR CATARACT USING ANTERIOR OCT

Oral

Isakova O.[1], Lutsenko N.*[1], Rudycheva O.[1], Kyrylova T.[1], Yatsun G.[2]

[1]Zaporizhzhia Medical Academy of Postgraduate Education ~ Zaporizhzhia ~ Ukraine, [2]Zaporizhzhia Regional Clinical Hospital ~ Zaporizhzhia ~ Ukraine

Purpose:

to study the morphology of posterior capsule and cortex in posterior subscapular cataracts before the cataract surgery using anterior optical coherent tomography (anterior OCT).

Methods:

the investigation was conducted from 2020 to 2022 in the microsurgery eye department of Zaporizhzhia Regional Clinical Hospital, Ukraine. Among total number of eyes with age cataract (1780 eyes) posterior subcapsular cataract was revealed in 512 cases (28,8 %). All subjects underwent anterior segment OCT (RTVue XR Avanti, Optovue, Inc., Fremont, CA). An assessment of the posterior capsule, position of lens opacities, their relationship with the posterior capsule and state of retrolental space was carried out.

Results:

: Three types of changes were identified. The first type comprised 312 eyes (61%), was characterized by a clear posterior capsule line, hyporeflective space with inclusions of different reflexivity and homogeneous hyperreflective foci in the posterior cortical layers. The second type consisted of 185 eyes (36%), where the capsule line was of different reflectivity and thickness, but always clear from the retrolental space side. There were dense adherence of hyperreflective foci in posterior cortical layers to the posterior capsule. The third type was found in 15 eyes (3%) with posterior capsule protrusion towards the retrolental space.

Conclusions:

preoperative using of anterior OCT of the lens allows to assess posterior capsule and posterior lens opacity and to perform surgical planning in order to avoid intraoperative complications.

Abstract 179

VITREOUS COMPOSITION MODIFICATION AFTER TRANSPALPEBRAL ELECTRICAL STIMULATION OF THE EYE: BIOCHEMICAL ANALYSIS

Oral

Colombo L.*, Caretti A., Rissotto R., Rossetti L.

ASST Santi Paolo e Carlo - University of Milan ~ Milan ~ Italy

Purpose:

Despite the growing literature on animal models, few data are available about biochemical changes induced by electrical stimulation (ES) of the eye in humans. The purpose of the study was to investigate the possible mechanism that regulates the beneficial effects of ES on retinal cells function and survival in humans.

Methods:

28 patients undergoing pars plana vitrectomy (PPV) for idiopathic epiretinal membrane (iERM) were randomly divided in two groups: 13 patients were treated with transpalpebral ES before surgery and 15 underwent surgery with no prior treatment. Vitreous samples were collected for biochemical analysis during PPV.

Results:

ES treatment leads to a reduction in the vitreous expression of both proinflammatory cytokines, namely IL-6 and IL-8, and proinflammatory lipid
mediators, such as lysophosphatidylcholine. Indeed, we observed a 70% decrease of lysophosphatidylcholine 18:0, which has been proven to exert the greatest proinflammatory activities among the lysophosphatidylcholine class. The content of triglycerides is also affected and significantly decreased following ES application.

Conclusions:

The vitreous composition displays significant changes following ES treatment. Proinflammatory cytokines and bioactive lipid mediators expression decreases, suggesting an overall antiinflammatory potential of ES. The investigation of the mechanism by which this treatment alters the retinal
neurons is essential for supporting ES therapeutic application in various types of retinal diseases.

Abstract 38

DOES THE TIMING OF THE VITREORETINAL SURGERY IMPACT YOUR SURGICAL PERFORMANCE? - A SIMULATOR-BASED STUDY.

Oral

Markan A.*, Gupta V., Bansal R., Katoch D., Dogra M., Tigari B., Singh R.

PGIMER ~ CHANDIGARH ~ India

Purpose:

To compare the surgical performance of vitreoretina trainees while performing various surgical manoeuvres on the Eyesi surgical simulator (VRMagic Holding AG) during different times.

Methods:

This was a prospective cross-over observational study where vitreoretina trainees (less than two years of surgical experience) were asked to perform various surgical tasks using the Eyesi surgical simulator (VRMagic Holding AG). The trainees were randomised into two groups. Group A performed surgeries during the morning (7-9 AM), and group B performed surgeries during the evening (4-7 PM). After completing assigned tasks, the trainees were cross-overed to the alternative group. Primary outcome measures included objective scores and time to perform each surgical maneuver in both groups. Secondary outcome measures included subjective scores given by each trainee and complications encountered.

Results:

Eight vitreoretinal trainees (3 males, 5 females) were included in the study. The mean age of male and female trainees was 34+4.58 years and 30.8+4.08 years, respectively. The mean objective score obtained to perform various tasks like navigation anti-tremor, pars plana vitrectomy and posterior vitreous detachment, bimanual training, bimanual scissors, and epiretinal membrane peeling was comparable in both the groups. The time taken to perform the above tasks was also similar. Iatrogenic retinal tears and retinal injuries were encountered more in the evening than morning. Subjectively the residents did not find any difference in either group.

Conclusions:

The timing of performing vitreoretinal surgery does not alter the surgical performance. This can be attributed to high motivation to learn and a good attention span of trainees at a young age.

Abstract 21

CASE SERIES OF CARLEVALE IOL IMPLANTATION WITH MODIFIED TECHNIQUE AND ASSOCIATED PROCEDURES

Oral

Danese C.*, Lanzetta P.

Department of Medicine - Ophthalmology, University of Udine ~ Udine ~ Italy

Purpose:

The aim of this retrospective study is to present our experience with secondary intraocular lens (IOL) implantation using the Carlevale lens (I71 FIL SSF Carlevale Lens. Soleko IOL Division). We report on the implantation of 26 Carlevale IOLs by a single surgeon (PL).

Methods:

Dislocation of IOL and capsular bag into the vitreous chamber affected 20 eyes. Three eyes had IOL opacification. One patient presented post-traumatic aphakia and rhegmatogenous retinal detachment. Another patient had dislocation of nuclear fragments into the vitreous chamber following complicated cataract surgery with rupture of the posterior capsule. In all the cases except two, the IOL anchors were positioned subconjunctivally in the absence of scleral flaps, through two cannulas in the ciliary sulcus, using forceps. In 19 eyes, a posterior vitrectomy was performed via the same cannulas. DSAEK and PK were associated in two cases, due to concurrent corneal decompensation.

Results:

After a median follow up of two years (range 10 days – 42 months) all the IOLs are correctly positioned. In one eye, one of the anchors partially broke during implantation, with the postoperative occurrence of conjunctival granuloma, which was successfully excised. The broken anchor was covered with a scleral patch. No cases of conjunctival erosions have been reported so far. The intraocular pressure (IOP) remained normal in all the patients. The median visual acuity was 0.2 (range count fingers – 0.7) preoperatively and 0.5 (range count fingers – 0.9), postoperatively.

Conclusions:

In conclusion, this case series reports our experience with Carlevale IOL, which represents a useful tool when performing secondary IOL implantation. The described modified technique of implantation is safe and effective. Also, the association of other intraocular procedures as needed is successful.

Abstract 211

OUTCOMES OF FOUR-POINTS GORETEX SCLERAL FIXATION IN PATIENTS WITH LUXATED 1-PIECE-4-HOLES IOL AND LOW ENDOTHELIAL CELL COUNT

Oral

Besozzi G.*, Nitti G., Costa M.C.

Vito Fazzi Hospital ~ Lecce ~ Italy

Purpose:

Four-points GoreTex scleral fixation (GTSF) is well-known technique. Our aim is to investigate the outcomes in patients with low endothelial cell count (ECC), saving the luxated 1-piece-4-holes IOL

Methods:

Sixteen eyes of 16 patients were enrolled. Informed consent was signed by all patients. Mean age was 78.8 +/- 4 years. All the patients had 1-piece-4-holes IOL luxation, spontaneously in 8 patients while it was subsequent to a trauma in 8 patients. All the patients had ECC <1500 cc/mm2. The patients underwent 23g pars plana vitrectomy, and GTSF of the IOL. Best-corrected visual acuity (BCVA), ECC, refraction in term of spherical equivalent (SE) and complications were evaluated. Follow-up was 6 months.

Results:

Fixation of the IOL was achieved in all patient. BCVA improved significantly from 0.47 +/- 0.24 to 0.74 +/- 0.26 ($p = 0.009$). ECC changed from 1213.7 +/- 159.1 to 1094.1 +/- 158, not significantly ($p = 0.051$). Final SE was -1.32 +/- 1.15. No significant complication occurred.

Conclusions:

GTSF is a safe and effective technique in patients with luxated 1-piece-4-holes IOL, particularly in those patients with preoperative low ECC. Further studies are recommended.

Abstract 231

IOL IMPLANTATION IN PATIENTS WITHOUT CAPSULAR SUPPORT: A COMPARISON BETWEEN YAMANE'S TECHNIQUE AND CARLEVALE SUTURELESS SCLERAL FIXATION IOL

Oral

Folegani V.*, Airaldi M., Parrulli S., Staurenghi G., Cereda M.G.

Luigi Sacco Hospital, University of Milan ~ Milan ~ Italy

Purpose:

To compare biometrics and clinical outcomes of two different techniques of secondary IOL implantation without capsular support: sutureless intrascleral IOL fixation with pre-charged 3 pieces IOL (Yamane's technique) and sutureless scleral IOL fixation of a Carlevale lens with scleral flaps.

Methods:

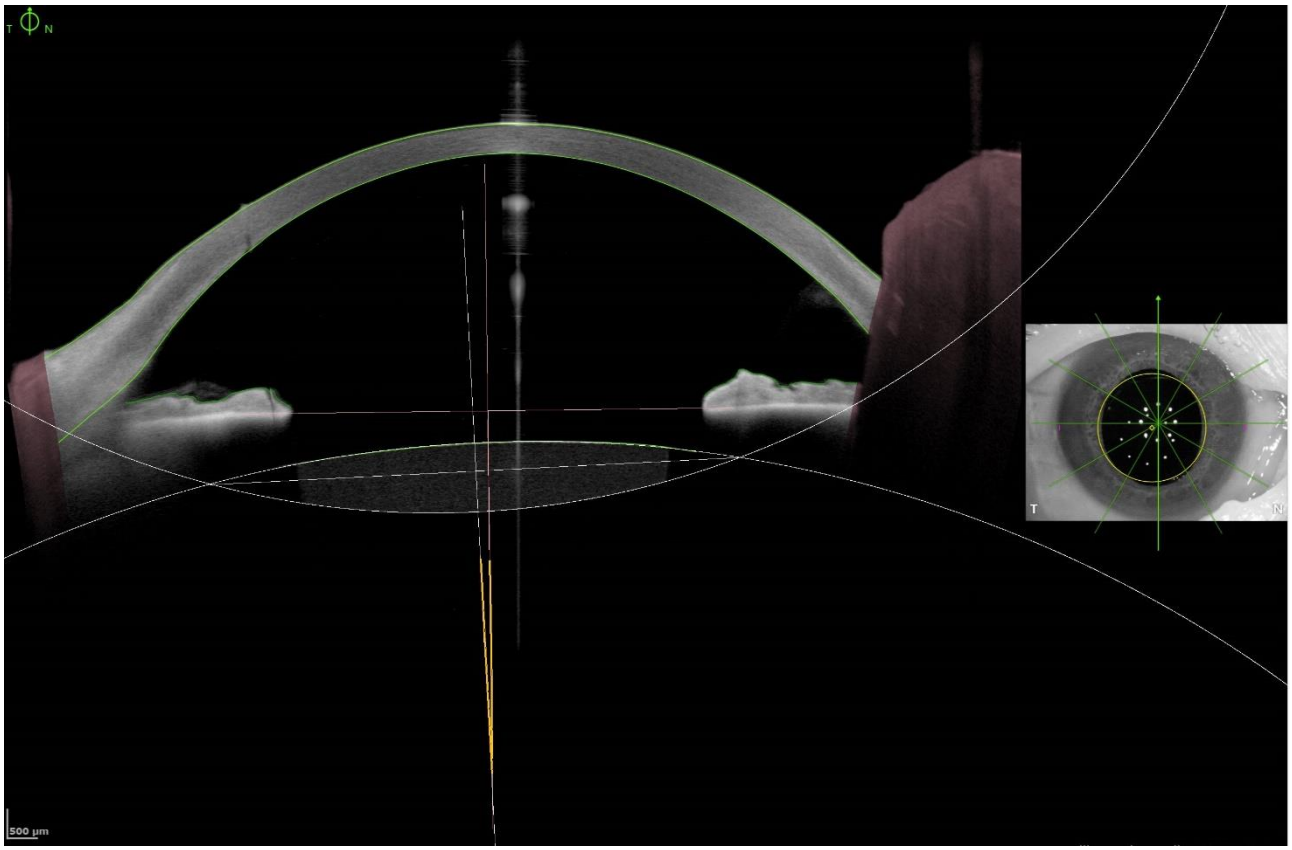
Prospective, monocentric study conducted at L.Sacco Hospital, Milan.
Consecutive eyes undergoing sutureless intrascleral IOL fixation (Yamane,PU6A,Kowa) or scleral fixated IOL implantation (Carlevale,FIL SSF) with scleral flaps were enrolled. Surgeries were performed by the same surgeon. The duration of each surgery was recorded.
Complete ophthalmic examination, specular microscopy, macular SD-OCT, combined anterior Segment OCT and corneal tomography were performed at baseline, 3 and 6 months.
Anterior segment OCT images were analyzed using ImageJ to quantify IOL tilt on vertical and horizontal axis. Visual and anatomical outcomes were compared between groups as well as changes in corneal curvature and IOL tilt.

Results:

Ten eyes were enrolled in the study, 5 eyes in each group.
Uncorrected visual acuity and BCVA continued to improve after surgery at every follow-up visit(all $p<0.01$), with no significant differences between the two techniques.
There were no differences at any time point between the two groups in: IOP, endothelial cells density, IOL tilt entity and direction, average simK values and anterior corneal astigmatism. Surgery time was significantly inferior in the Yamane group ($p=0.02$).
One patient in the Carlevale group developed retinal detachment treated with vitrectomy and gas tamponade. Two patients, one in each group, had post-surgical cystoid macular edema.

Conclusions:

Both techniques provided a good final visual acuity(82.5+-2.9 vs 79.6+-8.4, $p=0.54$) at 6 months with no differences in anatomical outcomes. Surgical times were significantly shorter in the Yamane group.
In our short-term comparative series, both the Yamane and the Carlevale technique represented viable options for sutureless scleral IOL fixation.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Abstract 220

SUBRETINAL VERSUS INTRAVITREAL TISSUE PLASMINOGEN ACTIVATOR FOR ACUTE SUBMACULAR HAEMORRHAGE: A RETROSPECTIVE COMPARATIVE STUDY

Poster

Gallo B.*, Nasir T., Shaikh S., Tanner V., Ho J., Anikina E.

Royal Berkshire NHS Foundation Trust ~ Reading ~ United Kingdom

Purpose:

No consensus currently exists on the best treatment strategy for acute submacular haemorrhage (SMH). The aim of this study is to compare the visual and anatomical outcomes, and the complications of subretinal versus intravitreal tissue plasminogen activator (tPA) in acute fovea-involving SMH.

Methods:

The electronic medical records of patients presenting with acute vision deterioration secondary to SMH between 2020 and 2022 were reviewed. Treatment was offered if the duration of symptoms was less than two weeks. Patients underwent either pars plana vitrectomy with subretinal tPA (25 µg/0.1 mL), intravitreal anti-VEGF and gas (sulfahexafluoride, SF6 or perfluoropropane, C3F8) (group A), or intravitreal tPA (25 µg/0.1 mL), anti-VEGF and gas (C3F8) (group B). SMH size at presentation and haemorrhage displacement were recorded. Best corrected visual acuity (BCVA) and complications at 1, 3, 6 and 12 months from treatment were compared between the groups.

Results:

25 eyes(16 females, group A 13 and group B 12 eyes)with a mean age of 77.6±10.4 years and a median follow-up of 8(range 1-21)months were included. Mean symptom duration was 4.6±3.4 days. SMH was secondary to wet-AMD in 24 eyes and retinal arterial macroaneurysm in 1 eye. Baseline SMH size and BCVA did not differ between the groups(p=0.23 and p=0.62). Haemorrhage displacement success rate was similar (84.6% and 66.7%; p=0.29) and post-operative BCVA at different time points did not differ between the groups (p=0.45). 3 eyes from group A developed complications including retinal detachment, macular hole and vitreous cavity haemorrhage.

Conclusions:

Subretinal and intravitreal tPA with gas are both effective techniques in displacing the subfoveal blood and allowing vision improvement. The post-operative visual outcomes did not differ between the two treatment groups. However, the subretinal approach carries higher risk of complications. Larger clinical trials are necessary to corroborate our findings.

Abstract 93

REFRACTIVE ERROR AFTER COMBINED PHACO-VITRECTOMY: A MULTICENTRIC STUDY

Oral

Kilian R.*[1], Crincoli E.[2], Rizzo C.[1], Ripa M.[2], Faraldi F.[3], Lavia C.[4], Tartaro R.[5], Ceruti P.[1], Casini G.[6], Rizzo S.[2], Savastano A.[2]

[1]University of Verona ~ Verona ~ Italy, [2]Fondazione Policlinico Universitario A. Gemelli IRCCS ~ Roma ~ Italy, [3]Azienda Ospedaliera ordine Mauriziano ~ Torino ~ Italy, [4]Azienda Sanitaria Locale TO5 ~ Chieri ~ Italy, [5]University of Florence ~ Firenze ~ Italy, [6]University of Pisa ~ Pisa ~ Italy

Purpose:

To study the post-operative refractive error (RE) of patients undergoing combined phaco-vitrectomy and to find out which intraocular lens (IOL)-power formula had the best refractive outcomes.

Methods:

In this retrospective multicentric study we compared the preoperative expected target with the postoperative RE of patients undergoing combined phaco-vitrectomy due to vitreomacular traction, macular pucker, full thickness macular hole or lamellar macular hole. A multinomial logistic regression was performed to compare the postoperative REs and the differences between expected and postoperative REs among the SRK-T, Olsen's and Holladay-2 formulas. The correlation between the difference in REs and IOL-power was also studied.

Results:

Sixty-seven eyes with a mean axial length of 23.73±1.21mm were included. Forty-two (63%), 14 (21%) and 11 (16%) eyes were implanted with an IOL that was calculated respectively with SRK-T, Olsen's and the Holladay-2 formula. The mean preoperative- and postoperative-REs were -0.16±0.12D and -0.48±0.17, respectively (p=0.045). SRK-T and Holladay-2 formulas led to a significant myopic shift whereas Olsen's caused a significant hyperopic error, independently from the IOL power.

Conclusions:

Independently from the IOL power, none of the analyzed formulas is precise at calculating the post-operative RE in patients undergoing combined phacovitrectomy.

Abstract 73

DIGITAL IMAGE WARPING TO MEASURE AND CORRECT METAMORPHOPSIA IN VITREORETINAL DISORDERS.

Oral

Williamson T.H.*[1], Valor C.[1], Ling Y.[2], Guillemaut J.[2], Frohlich D.[2]

[1]St Thomas Hospital ~ London ~ United Kingdom, [2]University of Surrey ~ Guildford ~ United Kingdom

Purpose:

Metamorphopsia is a common symptom before and after surgery for vitreoretinal disorders. At present quantitative and qualitative measurement of the symptom is not possible. We wished to design and investigate digital software to allow this with the potential for digital correction of images to treat the symptom.

Methods:

A computer program was developed with gaming software to allow image warping. The patient was tested by technician to correct a grid of squares to neutralise distortion perceived by the patient. 26 patients were tested with a variety of vitreoretinal conditions such as macular hole, macular epiretinal membrane (ERM) and postoperative retinal detachment (RRD). Measures were compared to subjective symptoms and other measures of distortion in clinical practice.

Results:

The mean age of the patients was 62.6 years with 16 males and 10 females. There were 14 retinal detachments, 6 macular holes and 6 epiretinal membranes. Subjective symptoms of micropsia vertically were related to aetiology with increased micropsia in RRD and macropsia in ERM (p=0.02). The measures showed a relation with Morphision parameters (p=0.01) but not with M charts. Symmetrical and asymmetrical patterns were detected.

Conclusions:

Gaming software allowed the development of an image warping program which could measure metamorphopsia. This allows the digital correction of the image presented to the patient to neutralise their perceived distortion. Such digital correction could be applied to the users digital imaging systems such as computer screens, phones and televisions.

Abstract 223

GLAUCOMA FOLLOWING PARS PLANA VITRECTOMY: A CASE SERIES AND REVIEW OF THE LITERATURE

Oral

Fahy E.*, Aguilar Munoa S., Barton K.

Moorfields Eye Hospital ~ London ~ United Kingdom

Purpose:

Primary and secondary glaucoma risk is increased in eyes which have undergone pars plana vitrectomy. We present a case series of uncontrolled glaucoma requiring surgical intervention, which occurred in the setting of prior vitrectomy. Multimodal imaging is included and the relevant literature is reviewed.

Methods:

5 surgical cases were reviewed which required aqueous shunt insertion to control glaucoma in eyes with prior vitrectomy. Preoperative clinical history, intraocular pressure (IOP), surgical approach and postoperative course was compiled for each case. Intraoperative images and video, as well as multimodal retinal imaging were included. The relevant literature was reviewed using Pubmed, and information on prevalence, etiology, risk factors, and clinical management of post-vitrectomy glaucoma collated.

Results:

5 cases were identified. Vitrectomy had been performed for retinal detachment in 4 cases and for a tractional retinal detachment secondary to diabetic retinopathy in 1 case. Mean patient age was 62 and mean preoperative IOP was 26 mmHg. Aqueous shunt surgery was performed for all patients (Paul Glaucoma Implant), at a mean time of 6.2 years following vitrectomy. 2 patients had 2 prior vitrectomies in the affected eye. None of the patients had evidence of glaucoma prior to vitrectomy.

Conclusions:

Glaucoma following vitrectomy is common and may require surgical management. The operation of choice is aqueous shunt insertion, given that these eyes are at risk for scarring and trabeculectomy failure. Further work is needed to determine whether surgical factors exist which could mitigate the risk of glaucoma following vitrectomy.

Abstract 160

MASSIVE SUBRETINAL HAEMORRHAGE

Oral

Scotti G.*, Boscia G., Landini L., Boscia F.

University of Bari ~ Bari ~ Italy

Purpose:

To describe the use of 23 Gauge vitrectomy + superior temporal retinotomy as a procedure to evacuate a massive subretinal haemorrhage with choroidal detachment.

Methods:

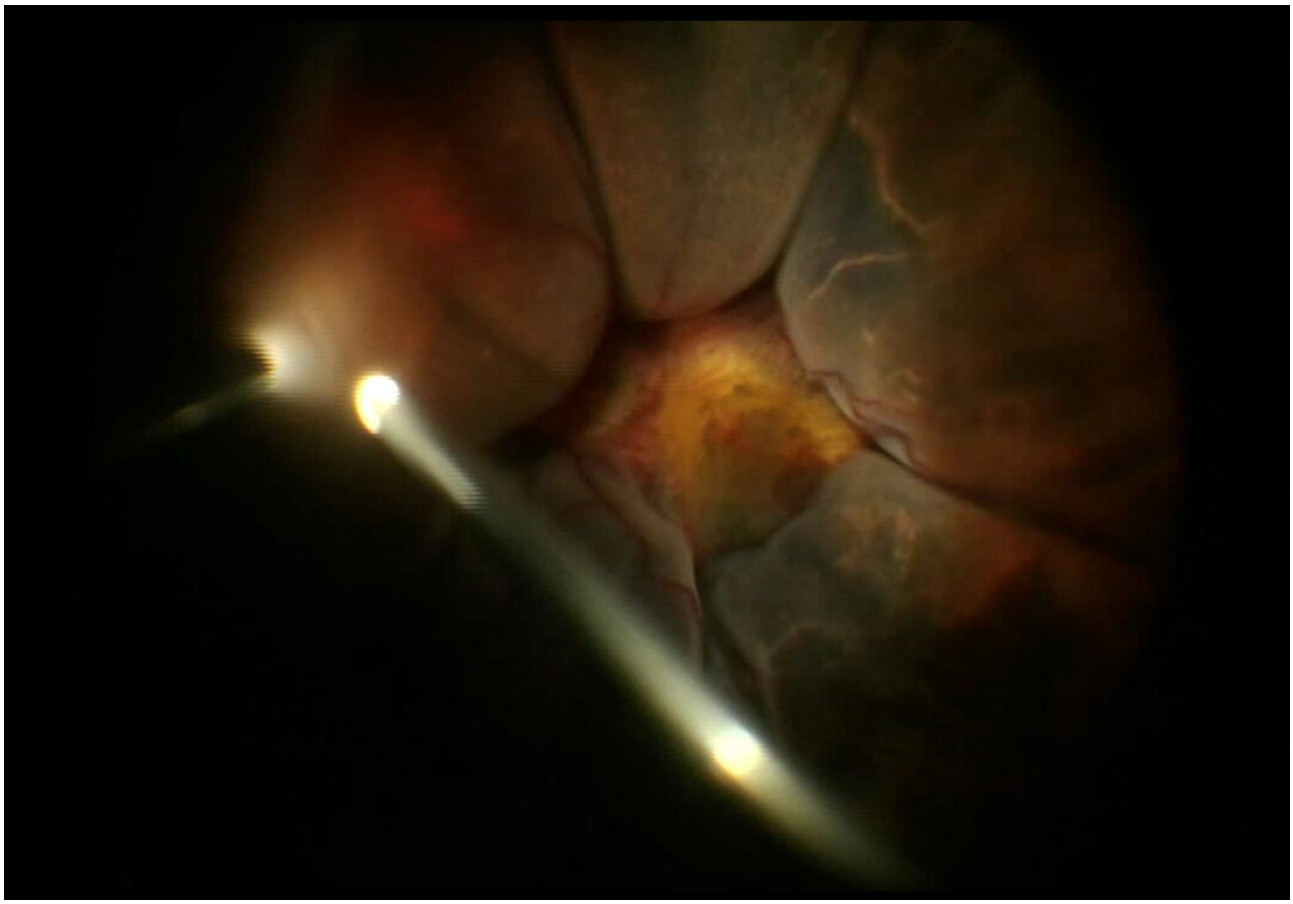
a 60 years old man, known for exudative AMD, presented for a severe vision loss (Visual acuity LP) due to a massive subretinal haemorrage. He underwent to a 23 Gauge vitrectomy, superior temporal retinotomy, evacuation of subretinal haemorrhage and blood clots, laser photocoagulation and silicon oil tamponade.

Results:

this surgical technique showed favourable functional and anatomical results, leading to a Visual acuity of and an improved quality of life.

Conclusions:

this video supports the use of retinotomy and silicon oil tamponade in selected cases of massive subretinal haemorrhage.



Abstract 120

RETROPUPILLARY IRIS CLAW IMPLANTATION: A RETROSPECTIVE ANALYSIS OF A MINIMALLY INVASIVE TECHNIQUE

Poster

Cappelli F.*, Bellina C., Scullica F., Azzolini C., Martone I., Azzollini E., Chelazzi P.

Istituto Clinico Città Studi, Ophthalmology department ~ Milan ~ Italy

Purpose:

To determine the outcomes of iris claw implantation regarding safety, refraction and surgical technique

Methods:

Data of 26 patients undergone Artisan retropupillary iris claw implantation from 2019 to 2022 were retrospectively collected from a single center.
The surgery was performed by a single expert surgeon. A 25 gauge pars plana vitrectomy preceded the lens implant. The site of corneal incision was at 12 o'clock position (5mm in length) allowing the manipulator being inserted through a single small 1.2 mm temporal incision to claw the lens distally and proximally ensuring its correct positioning.
Data regarding the indication to surgery, operating time, postoperative refraction analysis, incidence of complications were collected.

Results:

The mean follow-up duration was of 10,6 months.
The surgical indications were aphakia secondary to posterior capsular rupture(5; 19%),massive choroidal hemorrhage during cataract surgery (1;3,8%); subluxated IOL (12;46%),IOL exchange due to glistening (1;3,8%), post traumatic aphakia associated with retinal detachment (3;11,4%),cataract surgery for dislocated lens (2;7,6%), intumescent cataract (1;3,8%),acute angle closure attack (1;3,8%). IOL decentration or haptic disenclavation were recorded respectively in 2 patients (7.6%) and 1 patient (3.8%).
Cistoid Macular Edema (CME) presented in 3 patients (11,4%).
Corneal decompensation was not recorded.
IOP elevation was present in 2 patients (7.6%)
The mean astigmatism was 1.38 D.
The mean operating time was: 33.5 minutes.

Conclusions:

Artisan retropupillary iris claw is a relatively safe procedure.A minimally invasive approach to the iris claw implantation allows low grade corneal astigmatism and time saving compared to other surgical options such as fixating IOL. It provides higher safety profile than anterior chamber IOL implant. Thus a learning curve is necessary.

Abstract 128

OCULAR TOXOPLASMOSIS: CHALLENGING CASES

Poster

Interlandi E., De Luca M.*, De Marco R., Cirillo P.

Department of Ophthalmology, Ospedale del mare ~ Naples ~ Italy

Purpose:

to describe two not consecutive patients with a serious course of ocular toxoplasmosis.

Methods:

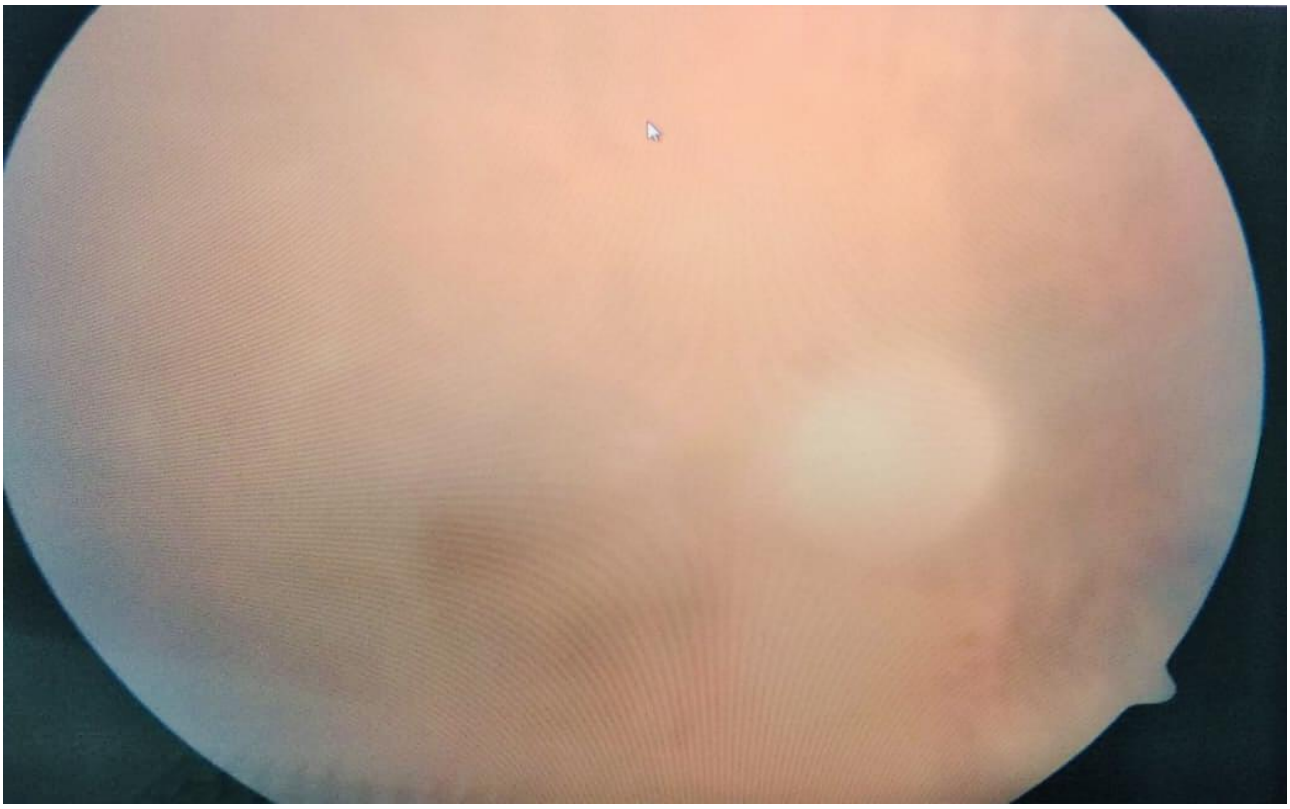
retrospective chart review

Results:

two not consecutive male patients, 79 and 28 years old, affected by severe monolateral ocular toxoplasmosis where referred to our uveitis service after a long term inappropriate approach with high dose of oral steroids following a misdiagnosis of idiopathic vitritis. Ophthalmic evalutaion disclosed severe panuveitis in both cases. Fundus was unexplorable cause of intensive vitritis associate to anterior granulomatous uveitis. Serologic work-up suggested in both patients a diagnosis of ocular toxoplasmosis then confirmed by PCR on vitreous sample. Then a challenging vitreoretinal surgery approach was necessary along with specific anti-toxoplasma therapy.

Conclusions:

ocular toxoplasmosis is a quite common ocular infection wich presentation of may greatly range from light forms to severe ones. A prompt diagnosis and a correct therapeutic approach is mandatory to avoid dramatic evolution of the disease.



Abstract 80

RETINAL VASOPROLIFERATIVE TUMOURS HAVE VARIED CLINICAL COURSE REQUIRING TAILORED MANAGEMENT

Oral

Ie A.*[1], Sagoo M.[2], Maclaren R.[1], Kapetanovic J.[1]

[1]Oxford Eye Hospital ~ Oxford ~ United Kingdom, [2]Moorfields Eye Hospital ~ London ~ United Kingdom

Purpose:

Retinal vasoproliferative tumours (VPT) are rare, benign vascular tumours associated with exudation. There is currently no consensus on management. Herein, we describe a varied clinical course and management of three patients with vasoproliferative tumours.

Methods:

Retrospective case series including clinical features, retinal imaging and interventions. Literature review included.

Case 1: 76-year-old female with vitreous haemorrhage and epiretinal membrane, found to have a longstanding solitary VPT. She previously declined plaque radiotherapy.

Case 2: 24-year-old female with an inferonasal VPT and retinitis pigmentosa (unknown genetic mutation). Examination demonstrated unilateral chronic cystoid macular oedema and inferonasal peripheral retinal yellow-red lesions with exudation.

Case 3: 28-year-old female with an inferotemporal VPT lesion and childhood-onset RP (CRB1 mutation) of Coat's-type phenotype. Examination revealed localised inferior serous detachment with a vascular complex, vitritis, and CMO. The fellow eye showed chronic tractional RD.

Results:

Case 1 underwent routine ERM surgery and a quiescent VPT was noted intraoperatively. Observation continued and she remained stable 1-month post-op.

Case 2 underwent initial intravitreal Ozurdex/cryotherapy. 6 months post-operatively showed good response of VPTs, though her CMO progressed. The decision was made for observation due to pregnancy. She was stable at 9 months review.

Case 3 was offered intravitreal anti-VEGF and oral acetazolamide. Laser was performed to inferior RD. External plaque radiotherapy was given for increasing submacular fluid, which stabilised the fundus. However, post-radiation retinopathy and inflammation ensued. Subtenon triamcinolone mitigated the inflammation/CMO and close observation for inflammatory/fibrovascular membranes continues.

Conclusions:

VPTs are rare and there is currently no consensus on management. These cases reiterate the need for tailored management according to patient factors. More severe presentations may be associated with inherited retinal dystrophies. In our series, CRB1 variant led to a particularly prolonged and complicated clinical course requiring aggressive management.

Abstract 228

ENDORESECTION VIA PARS PLANA VITRECTOMY AND ADJUVANT RUTHENIUM BRACHYTHERAPY FOR UVEAL MELANOMA: A SINGLE CENTER CASE SERIES

Oral

Mazzini C.[1], Di Leo L.*[1], Vicini G.[1], Pieretti G.[1], Barca F.[2], Rizzo S.[3], Giansanti F.[1]

[1]University of Florence ~ Florence ~ Italy, [2]Piero Palagi Hospital ~ Florence ~ Italy, [3]Catholic Univerisity ~ Rome ~ Italy

Purpose:

To evaluate the anatomical and functional outcomes after endoresection and adjuvant Ruthenium(Ru)-106 brachytherapy for uveal melanoma (UM).

Methods:

Retrospective case series of 15 UM patients (15 eyes) treated at our centre (Careggi University Hospital, Florence).

Results:

Mean BCVA at baseline was 20/50. Mean tumor thickness was 7.14 mm (± 2.05), and mean largest basal diameter was 11.2 mm (± 1.92). A concurrent retinal detachment was diagnosed in 11 patients (73.3%). 11 patients (73.3%) were treated with primary endoresection, while 4 patients (26.7%) were treated with a “salvage endoresection” after primary treatment failure. Mean follow-up time was 28.9 months (± 10.6). Treatment achieved local control of the disease in 14 out of 15 cases (93.3%). One patient underwent enucleation for disease recurrence. The overall-survival rate was 93.3%. Mean BCVA at last follow-up visit was 20/40.

Conclusions:

Endoresection is a valuable conservative option for selected UM patients and can be used both as a primary treatment and as a salvage therapy. It allows to control melanoma and avoid enucleation, reduces the radiation-related complications, and provides tumor tissue for chromosomal analysis and prognostic testing.

Abstract 130

MANAGEMENT OF RECURRENT OPTIC DISC PIT-ASSOCIATED MACULOPATHY WITH HUMAN AMNIOTIC MEMBRANE GRAFT

Oral

Landini L.*, Boscia G., Scotti G., Boscia F.

Università degli studi di Bari ~ Bari ~ Italy

Purpose:

to present a new technique involving a human amniotic membrane patch (hAM) to treat refractory retinal detachment secondary to optic disc pit

Methods:

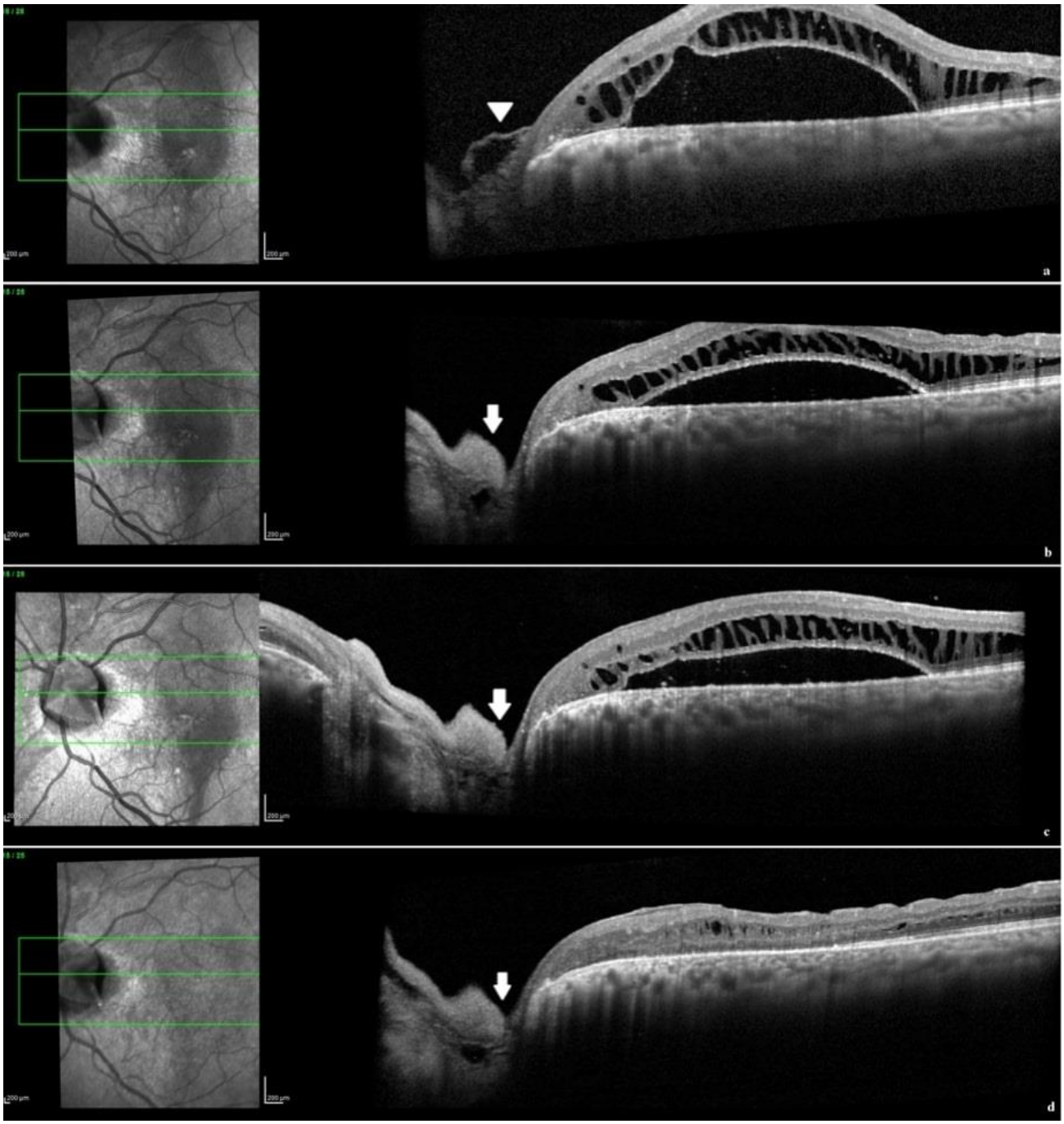
Two eyes of two patients affected by recurrent macular detachment associated with optic nerve head pit (ODP), after PPV and inverted ILM flap translocation along with gas tamponade were enrolled. A 25-gauge were performed, and hAM patch was implanted inside the OPD; 18% SF6 was used as endotamponade. The patients were instructed to maintain face-down position for the first days after surgery. Patients were examined at month 1, 3, and 6 after surgery. At each visit, patients underwent a complete ophthalmologic examination including optical coherence tomography (OCT) (Optovue RTVue XR 100 AVANTI, Optovue, Inc. or Spectralis OCT, Heidelberg Engineering).

Results:

The subretinal fluid gradually resolved during 6 months of follow-up, and visual acuity improved to 20/25 at the sixth month after surgery. We did not observe a recurrence of subretinal fluid during the 6 months of follow-up. No postoperative complications were reported during the follow-up.

Conclusions:

The use of hAM is a new approach to treat refractory retinal detachment secondary to congenital optic disc anomalies and adds to our options of dealing with this complex condition. All the cases were successful with encouraging visual acuity recovery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Abstract 10

SURGICAL MANAGEMENT FOR OPTIC DISC PIT MACULOPATHY - A NEW APPROACH

Oral

El--Ashry M.*[2], Saincher S.[2], Datta S.[2], Maghsoudlou P.[1]

[1]Bristol Eye Hospital ~ Bristol ~ United Kingdom, [2]Great Western Hospital ~ Swindon ~ United Kingdom

Purpose:

Optic disc pits are a rare congenital defect in the optic disc that can be complicated with maculopathy causing visual impairment. Relatively little is known about this pathology and treatment options are not fully understood. This case review aims to explore surgical options for managing optic disc pit maculopathy.

Methods:

Four patients presented with optic disc pit maculopathy and their medical records were retrospectively reviewed. Group 1 (1 patient) had a pars plana vitrectomy, internal limiting membrane peel (ILM) and gas with mild laser photocoagulation treatment at the temporal disc margin while group 2 (3 patients) received a pars plana vitrectomy, ILM peel and gas (2/3 patients had revision vitrectomy) with a customised intense laser photocoagulation regime at the temporal disc margin with a white reaction.

Results:

Group 1 is a 56-year-old female with a preoperative and postoperative visual acuity of 0.8 (logMAR) and 1.2 respectively. Group 2 (2 females and 1 male) has an average age of 62.3 years and an average preoperative and postoperative visual acuity of 0.53 and 0.31 respectively. These patients had improved vision with preserved central visual field with no reduced sensitivity and stable retinal condition after 2.5 years follow up.

Conclusions:

Surgery is a viable treatment for optic disc pit maculopathy. Repeated intervention may be necessary and early surgery may have better visual outcomes. The laser photocoagulation regime in group 2 produced the best results for preserving visual acuity.

Abstract 212

A CASE REPORT OF BILATERAL OPTIC DISC PIT MACULOPATHY TREATED WITH HUMAN AMNIOTIC MEMBRANE (HAM) PATCH: DIFFERENT MACULAR ENTITIES REQUIRE DIFFERENT HAM PATCH IMPLANTS

Poster

Fiore T.*[1], Tosi G.[1], Tucci D.[1], Giansanti F.[2], Cagini C.[1]

[1]Department of Biomedical and Surgical Sciences, Section of Ophthalmology, University of Perugia, S. Maria della Misericordia Hospital ~ Perugia ~ Italy, [2]Department of Translational Surgery and Medicine, Ophthalmology Unit, University of Firenze ~ Firenze ~ Italy

Purpose:

To report a patient treated for bilateral optic disc pit maculopathy (ODP-M) with an associated macular hole (MH) in left eye (LE) and a serous macular detachment (SRE) in the right eye (RE) treated with a pars-plana vitrectomy (PPV) combined with the implantation of a human amniotic membrane (hAM) patch.

Methods:

A 46 years-old man referred to our clinic for vision loss. After an ophthalmic evaluation, including best corrected visual acuity (BCVA), fundus examination, and optical coherence tomography (OCT), patient was diagnosed with ODP-MH in LE and addressed to PPV and hAM implantation inside MH. Twenty months later, following an increase of SRE in RE, PPV was performed with hAM patch implanted inside the ODP. Air was used as endotamponade. During follow-up, hAM was found nor completely adherent to ODP and SRE was found increased. A second surgery was then planned, and hAM gently pushed to close the ODP.

Results:

In LE, after PPV and hAM implantation inside MH, BCVA improved from 20/400 to 20/200 and OCT showed MH closure. In RE, BCVA before surgery was 20/50. After the first surgical procedure, despite the hAM positioning to cover the ODP, OCT disclosed an increase SRE with a marked foveal thinning and a further decrease of BCVA to 20/40. A second surgery was then planned to push the hAM inside the OPD to mechanically close the pit. During follow-up, BCVA improved up to 20/20 and OCT showed a slowly decreased of SRE and a slow increase of macular thickening.

Conclusions:

Implant of the hAM may be effective to repair optic disk pit maculopathy. The correct placement of hAM inside the OPD to close the pit seems necessary to close the interconnections between the vitreous cavity, subarachnoid space, and subretinal space.

Abstract 7

TREATMENT OF MACULOPATHY ASSOCIATED WITH OPTIC DISK PIT BY HUMAN AMNIOTIC MEMBRANE PATCH: A ONE-YEAR RESULTS

Oral

Caporossi T.[1], Scampoli A.*[1], Tartaro R.[2], D''Amico G.[1], Rizzo S.[1]

[1]1 Department of Ophthalmology, Catholic University of Sacred-Heart Foundation "Policlinico Universitario A. Gemelli" IRCCS, Rome Italy ~ Romw ~ Italy, [2]2 Department of NEUROFARBA, Ophthalmology, University of Florence, Careggi, Florence, Italy ~ Florence ~ Italy

Purpose:

To report the 1-year results of a new surgical technique involving a human amniotic membrane patch to reduce the maculopathy related to an optic nerve head pit.

Methods:

This is a prospective, consecutive, non-randomized interventional study.
Methods:
• Setting: Single Institution.
• Patient: We included eleven eyes of 11 patients affected by macular detachment associated with optic nerve pit were included.
• Intervention: A 25-gauge pars plana vitrectomy was performed in all cases, with an implant of a human amniotic membrane patch inside the optic nerve pit and air as endotamponade.
• Main outcomes and measures: The primary study outcome was the reabsorptions of the subretinal and intraretinal fluid. Secondary outcomes were visual acuity improvements and postoperative complications.

Results:

Mean preoperative central retinal thickness gradually diminished from 512 ± 137 µm to the 243 ± 19 µm at 12-month follow-up. The mean visual acuity improved form 20/80 at baseline to 20/32 at the 12-month follow-up. A complete subretinal fluid resorption occurred in 9 eyes on 11 (81.8%) and a partial resorption in 2 eyes (18%). We did not observe a recurrence of subretinal fluid during the 12 months of follow-up. No intraoperative nor postoperative complications were reported during the follow-up. The amniotic membrane patch remains stable and detectable inside the pit for the entire follow-up.

Conclusions:

amniotic membrane implant may be effective to improve an optic disc pit maculopathy. All the cases reported an anatomical improvement and encouraging visual acuity recovery.

Abstract 196

COMBINED DEXAMETHASONE INTRAVITREAL IMPLANT AND SILICONE REMOVAL FOR THE TREATMENT OF MACULAR EDEMA AFTER COMPLEX REGMATHOGENOUS RETINAL DETACHMENT

Oral

Pignatelli F.*, Nacucchi A., Addabbo G.

Ospedale SS Annunziata ~ Taranto ~ Italy

Purpose:

To investigate efficacy and safety of combined dexamethasone intravitreal implant and silicone oil removal procedure for the treatment of macular edema resistant to medical therapy after complex retinal detachment surgery.

Methods:

19 patients underwent complex retinal detachment surgery with silicone oil tamponade and persistent macular edema were included in the study. These patients underwent silicone oil removal surgery combined to dexamethasone 0.7 mg intravitreal implant (Ozurdex). Changes in best corrected visual acuity, in central macular thickness and the rate of complications were our outcomes. To test the change of BCVA and CMT over follow-up was used Wilcoxon rank-sum test. All statistical tests were performed at the $p<0.05$ significance level.Univariate regression model was performed to assess the relationship between BCVA and CMT at 6 months post-SO removal combined with DEX-i and each indipendent variable

Results:

BCVA significantly improved to 0.77±0.3 LogMar after 1 month (p=0.001) from vitrectomy. After SOr + DEX-i, BCVA significantly improved to 0.62±0.3 LogMar at 1 month and remained stable over six months.After SOr + DEX-i, CMT significantly decreased over follow-up ($p<0.0001$).Univariate regression models revealed a significative relationship (β= -0.45; p 0.001) between last BCVA and macular status when DDR occurred. Furthermore, a significative relationship (β= -1.84;p 0.01) between last CMT and the time period between vitrectomy and SOr + DEX-i was reported.Ocular hypertension (>30 mmHg) was observed in only one patient during the first week after vitrectomy.

Conclusions:

Macular edema is a frequent post surgical complication, and it could become chronic and recalcitrant. In our experience dexamethasone implant combined to silicone oil removal is a safe and valid option.

Parameters	β	se (β)	p	C.I. (95%)
6m Post SOr+DEX-i BCVA				
Gender (w)	-0.27	0.12	**0.03**	-0.52 to -0.02
Age (yrs)	-0.002	0.01	0.78	-0.02 to 0.01
Glaucoma (Yes)	0.03	0.15	0.85	-0.29 to 0.35
Pseudophakic	-0.01	0.14	0.97	-0.29 to 0.28
Days between diagnosis and PPV	0.05	0.06	0.43	-0.07 to 0.17
Days between PPV and SOr+DEX-i	-0.001	0.01	0.78	-0.01 to 0.01
RRD Macula (On)	-0.45	0.12	**0.001**	-0.70 to -0.19
6m Post SOr+DEX-i CMT				
Gender (w)	-16.87	20.26	0.41	-58.90 to 25.15
Age (yrs)	0.74	1.24	0.56	-1.84 to 3.32
Glaucoma (Yes)	31.83	22.90	0.18	-15.67 to 79.33
Pseudophakic	-4.03	21.33	0.85	-48.26 to 40.19
Days between Diagnosis and PPV	-0.15	9.35	0.99	-19.55 to 19.24
Days between PPV and SOr + DEX-i	-1.84	0-67	**0.01**	-3.24 to -0.44
RRD Macula (On)	-21.47	23.44	0.37	-70.10 to 27.15

Abbreviations:SOr, Silicon Oil removal; DEX-i, intravitreal dexamethasone implant; BCVA, Best-corrected visual acuity; CMT, Central macular thickness; PPV, Pars Plana Vitrectomy; RRD, Regmatogenous Retinal detachment; β, Coefficient; se (β), Standard Error of β; C.I. (95%), Confidential Interval at 95%.

Table 4. Comparison between different parameters over follow-up (months).

		Baseline	***Post Vitrectomy***	
			1m	3m
BCVA (LogMar)		1.12±0.49	0.77±0.3	0.99±0.3
	p[1]		***0.001***	***0.08***
CMT (µm)		*na*	369.6±83.3	429.6±59.1
	p			***0.007***

	Pre SO removal + DEX-i	***Post SO removal + DEX-i***		
		1m	3m	6m
BCVA (LogMar)	0.99±0.3	0.62±0.3	0.62±0.3	0.60±0.3
p		***<0.0001***	***<0.0001***	***<0.0001***
CMT (µm)	429.6±59.1	271.8±28.4	287.9±32.4	294.0±46.4
p		***<0.0001***	***<0.0001***	***<0.0001***

[1] *Wilcoxon matched-pairs signed-rank test; m, month; BCVA, Best-corrected Visual Acuity, SO, Silicon Oil; DEX-i, intravitreal Dexamethasone-implant; 3m Post Vitrectomy = Pre SO removal + DEX-i*

Abstract 219

A SIMPLE TECHNIQUE TO REDUCE THE ANTERIOR CHAMBER HEAVY SILICONE OIL RESIDUES AFTER EXTRACTION PROCEDURES

Poster

Giuliani G.*, Primavera V.

Ospedale "F. Perinei" - Altamura - ASL Bari ~ Altamura ~ Italy

Purpose:

To describe a simple technique to reduce the anterior chamber heavy silicone oil (HSO) residues after HSO extraction. We use this procedure routinely during the HSO extraction surgery.

Methods:

After placed the three 23-Gauge trocars and the infusion canula, we open the infusion system with a 25mmHg pressure. We open the anterior chamber with a 20-Gauge needle at 10 o'clock position for the right eye and 2 o'clock position for the left eye. We enter in the anterior chamber with a 25 Gauge backflush flute with a silicone tip needle. We use the passive aspiration, produced by the infusion pump at 25 mmHg, to remove the silicone micelles deposited in the iridocorneal angle and on the IOL surface. After this procedure we continue with the standard HSO extraction technique.

Results:

In comparison with poli-dimethylsiloxane (PDMS), the use of HSO is more frequently associated to inflammatory reactions and increase in IOP in susceptible patients. Higher inflammatory reactions using HSO seem to be triggered due to their emulsification tendency1. The duration of tamponade application seems to be associated to an increased risk of inflammation 2-4. We believe that leaving silicone micelles in the anterior chamber, after silicon extraction, can promote inflammation and IOP elevation. We have been using this procedure routinely during the HSO extraction surgery for 2 years. We had no cases of IOP elevation or inflammation after HSO extraction.

Conclusions:

Studies are needed for validation of this technique.

Abstract 9

INTRAVITREAL METHOTREXATE INFUSION AVOIDS POSTOPERATIVE PROLIFERATIVE VITREORETINOPATHY IN UNCOMPLICATED PRIMARY RETINAL DETACHMENT

Oral

Soares L.*, Cella W.

Escola Paulista de Medicina (EPM - UNIFESP) ~ Sao Paulo ~ Brazil

Purpose:

To evaluate the incidence of postoperative proliferative vitreoretinopathy (PVR) after continuous intravitreal methotrexate infusion (IMI) during pars plana vitrectomy in patients with uncomplicated primary retinal detachment.

Methods:

This study is a single-center retrospective cohort design of patients with primary retinal detachment who had undergone pars plana vitrectomy (PPV) with intravitreal IMI. Patients with primary rhegmatogenous retinal detachment (RRD) were included with PVR grade A or B. Patients with less than 40 years old or incomplete posterior vitreous detachment were excluded.

Results:

Eleven eyes of ten patients were submitted to PPV with IMI for primary RRD. Six patients had PVR grade A and 5 patients had grade B. Postoperative visual acuity increased in 10 eyes and remained unchangeable in 1 eye at 12 weeks of follow-up. At the last follow-up visit, all patients had attached retina with no signs of PVR or toxicity.

Conclusions:

The present study demonstrated that IMI during PPV is a feasible and a safe approach in cases of preoperative PVR A or B in reducing the chances of PVR reproliferation in the postoperative period.

Case	Gender	Age (y)	Eye	Surgery	pre VA	PVR	Time of onset (d)	Mac	Quad	Retinal tear	Tamponade	post VA
1	F	58	OD	Phaco+ PPV	HM	A	6	off	2 superior	H (09h e 11h)	C3F8	20/20
2	F	63	OD	Phaco+ PPV	HM	A	21	off	2 superior	H (11h)	C3F8	20/20
3	F	51	OD	Phaco+ PPV	CF	A	5	off	2 superior	H (7h e 10h)	Silicon Oil	20/60
4	M	49	OS	Phaco+ PPV	20/20	A	11	on	1 superior	H (11h)	C3F8	20/20
5	F	54	OD	Phaco+ PPV	LP	A	15	off	2 superior	H (12h e 6h)	Silicon Oil	20/80
6	M	47	OS	PPB	HM	A	30	off	2 superior	G (Superior)	Silicon Oil	20/25
7	M	47	OD	SB+PPV	20/40	B	3	off	2 inferior	G (inferior)	Silicon Oil	20/20
8	F	58	OS	Phaco+ SB+PPV	LP	B	15	off	total	H (multiples)	Silicon Oil	20/80
9	M	66	OD	SB+PPV	20/400	B	4	off	2 inferior	H (07h e 08h)	Silicon Oil	20/100
10	M	64	OS	SB+PPV	HM	B	60	off	2 inferior	H (05h)	Silicon Oil	20/400
11	M	72	OD	SB+PPV	HM	B	30	off	3	H (10h)	Silicon Oil	20/150

TABLE 1

Abbreviations: F, female; M, male; y, years; VA, visual acuity; Phaco, phacoemulsification; PPV, pars plana vitrectomy; SB, scleral buckle; HM, hands motion; CF, count fingers; LP, light perception; PVR, proliferative vitreoretinopathy; d, days; Mac, macula; Quad, retinal quadrants; H, horseshoe tear; G, giant retinal tear; h, hour.

Abstract 11

COMPARISON BETWEEN SCLERAL BUCKLING AND VITRECTOMY IN THE ONSET OF CYSTOID MACULAR EDEMA AND EPIRETINAL MEMBRANE AFTER RHEGMATOGENOUS RETINAL DETACHMENT REPAIR

Oral

Albanese G.M.*, Gharbiya M., Visioli G., Iannetti L., Marenco M., Tamburelli A.C., Iannaccone A.

Sapienza University of Rome ~ ROme ~ Italy

Purpose:

To investigate the incidence and risk factors for the main complications in patients with rhegmatogenous retinal detachment treated with scleral buckling (SB) or pars plana vitrectomy (PPV).

Methods:

A retrospective, comparative, observational study was conducted. The medical records of 107 patients with primary rhegmatogenous retinal detachment who were managed with SB (n = 57) or PPV (n = 50) were reviewed. Scleral buckling was performed using scleral encircling solid silicone band and circumferential solid silicone exoplant to support the break. Pars plana vitrectomy was combined with phacoemulsifi- cation in phakic eyes and with scleral encircling in inferior detachments. Follow-ups, includ- ing spectral-domain optical coherence tomography examination, were scheduled at 1, 3, and 12 months after surgery. Propensity score matching was used to adjust for potential preoperative selection bias.

Results:

The overall incidence of postoperative cystoid macular edema (CME) and epiretinal membrane was 14.95% and 30.84%, respectively. Compared with SB, CME was more frequent in the PPV (P = 0.021) and in the PPV pseudophakic eyes (P = 0.027). Postoperative CME was an early, predominantly transient complication and regressed in 67% of SB and in 77% of PPV eyes within 12 months after surgery. No differences were observed regarding epiretinal membrane development. Except for the surgical technique, no preoperative factors associated with CME were identified. A correlation between epi- retinal membrane and patients' age was found (P = 0.028).

Conclusions:

The incidence of CME after rhegmatogenous retinal detachment repair was higher in patients who underwent PPV, either alone or combined with phacoemulsification, than in those treated with SB. Epiretinal membrane development was correlated to older age, regardless of the surgical procedure.

Abstract 190

HEAVY SILICONE OIL EXTRACTION: EVALUATION OF A MIXED 25/23 GAUGE SUTURELESS APPROACH

Oral

Forlini M.*

Department of Ophthalmology - San Marino State Hospital ~ San Marino ~ San Marino

Purpose:

To evaluate the feasibility of a mixed 25/23 gauge technique for the extraction of Heavy Silicone Oil in patients who underwent surgery for retinal detachment

Methods:

5 eyes of 5 patients underwent a 25 gauge transconjunctival sutureless pars plana vitrectomy for inferior retinal detachment with Heavy Silicone Oil tamponade.
After 3 months the patients were retreated to remove the Heavy Silicone Oil using a mixed sutureless 25/23 gauge technique.
In all the cases a twin-light chandelier and an illuminated trans-scleral depressor were used.

Results:

All the 5 patients were successfully treated with an average time of 12 minutes.
The IOP during the procedures was always stable.
In all the 5 cases sutures were not needed at the end of the surgery to close the sclerotomies (sutureless technique).
At 3 months of follow up, no adverse effects or complications (ocular hypertension, retinal redetachment) were observed.

Conclusions:

The 25/23 gauge technique showed a high safety profile and allows a fast and efficient Heavy Silicon Oil removal.

Abstract 168

INCIDENCE OF RETINAL DETACHMENT AFTER SILICONE OIL REMOVAL IN EYES AFTER SEVERE POSTOPERATIVE ENDOPHTHALMITIS

Oral

Lopes I.*, Mautone L., Spitzer M., Skevas C.

University Medical Center Hamburg-Eppendorf ~ Hamburg ~ Germany

Purpose:

To investigate the incidence of retinal detachment (RD) after silicone oil removal (SiR) in eyes after severe postoperative endophthalmitis (PEO) that required pars plana vitrectomy (PPV) with silicone oil.

Methods:

In this single-center, retrospective study electronic patient records in a tertiary university referral center were reviewed.

Results:

33 eyes of 33 patients were included with a mean follow-up of 13.8 months (range 3 - 53 months). Eyes were divided into two groups, endophthalmitis after cataract surgery and endophthalmitis after anti-VGEF-intravitreal injection ([IVI], groups 1 and 2 respectively).
The mean time to SiR was 2.6 months (range 5 days - 8 months). The overall incidence of RD after SiR was 23.3%, 23.5%, and 18.8% in groups 1 and 2, respectively. The mean time to RD was 28 days (3 - 82 days, SD ± 32 days). Proliferative vitreoretinopathy (PVR) was the main cause of RD after SiR (85.7%).

Conclusions:

RD is a common complication after SiR in eyes with severe PEO that have been treated with PPV with silicone oil filling. PVR is the most common cause of RD after SiR in eyes with a history of PEO.

Abstract 64

SILICONE OIL INSULATION EFFECTS ON FLASH ELECTRORETINOGRAM AND VISUAL EVOKED POTENTIAL IN PATIENTS WITH RETINAL DETACHMENT

Poster

Papachristou A.*[1], Giannakopoulou T.[2], Plainis S.[2], Tsilimbaris M.[1]

[1]Ophthalmology Department, University Hospital of Heraklion, Heraklion, Greece ~ Heraklion ~ Greece, [2]Laboratory of Optics and Vision, School of Medicine, University of Crete, Heraklion, Greece ~ Heraklion ~ Greece

Purpose:

Silicone oil is used in the surgical management of retinal detachment as a tamponade to maintain the retina reattached when indicated. This study investigates the hypothesis that silicone oil causes insulation effects on the retina by affecting its response to light.

Methods:

Electrophysiological responses to a flash stimulus were recorded using full-field electroretinography (ERG) and visual evoked potentials (VEP). Recordings were performed in 9 patients who underwent surgery for retinal detachment, before (1-2 days) and after (2-3 weeks) silicone oil removal (SOR) in both the study and the control eye. Flash ERG and VEP recordings were performed according to the ISCEV standard protocol.

Results:

Statistically significant differences were found in the study eye in the amplitudes of the ERG responses and their corresponding ratios before and after SOR in all conditions tested. No differences were observed in the control eye. The mean ratio of photopic ERG response was 2.8±1.4 for the study and 1.1±0.4 for the control eye (p=0.003). The mean ratio of ERG flicker response was 2.9±2.5 and 0.9±0.3, respectively (p=0.03). Scotopic flash ERG ratio was 1.8±0.7 for the study and 1.1±0.6 for the control eye (p=0.038). No differences were observed for the amplitude and latency of flash VEP response after SOR.

Conclusions:

Silicone oil causes a reduction in flash ERG responses; no effect was found on flash VEP responses. ERGs in eyes filled with silicone oil should not be considered representative of their retinal function, in contrast to VEPs, which are not affected by silicone oil presence.

Abstract 186

OCT ANGIOGRAPHY EVALUATION OF MACULAR PLEXUSES FOLLOWING PRIMARY RHEGMATOGENOUS RETINAL DETACHMENT SURGERY: IMPACT OF SURGICAL TECHNIQUE AND TAMPONADE CHOICE

Oral

Vivarelli C.*[2], Gironi M.[1], D'aloisio R.[1], Verdina T.[3], Mura M.[2], Mastropasqua R.[1]

[1]University "G. D'Annunzio" Chieti-Pescara ~ Chieti ~ Italy, [2]University of Ferrara ~ Ferrara ~ Italy, [3]University of Modena and Reggio Emilia ~ Modena ~ Italy

Purpose:

To evaluate state of macular microcirculation after macula-on and macula-off rhegmatogenous retinal detachment (RRD), successfully treated with different surgical techniques and tamponade, and the correlation with visual acuity.

Methods:

This retrospective observational study included 82 patients, 33 macula-on and 49 macula-off. 70 underwent pars plana vitrectomy, whereas 12 underwent scleral buckling. 65 eyes were filled with gas, 17 received silicone oil (SO). Optical coherence tomography angiography (OCT-A) was used to evaluate macular perfusion in superficial capillary plexus (SCP), in deep capillary plexus (DCP) and in choriocapillary plexus. We recorded preoperative and postoperative best visual acuity (BCVA), foveal avascular zone (FAZ) in SCP and in DCP, central macular thickness (CMT), development of cystoid macular edema and epiretinal membrane.

Results:

Macula-on eyes filled with gas had better postoperative BCVA than those filled with SO ($p = 0.003$). There was significant decrease in SCP vessel density (VD) and larger FAZ in RRD eyes compared to fellow eyes. Type of tamponade was correlated with DCP FAZ in macula-off group ($p = 0.024$). Subgroup analysis dependent on type of surgery and tamponade showed no significant difference in VD. A negative correlation was observed between SCP VD and BCVA ($p = 0.028$) and between SCP VD and SO duration ($p = 0.039$). Eyes filled with SO had a greater CMT ($p = 0.002$).

Conclusions:

RRD cause decreased retinal perfusion even after successful anatomical repair. Macula-on eyes filled with SO presented suboptimal vision gain. SO correlated with a greater risk of developing cystoid macular edema. We suggest early removal of SO to reduce damage caused and a carefully considered decision especially regarding RRD macula-on eyes.

Abstract 159

RHEGMATOGENOUS RETINAL DETACHMENT IN CHOROIDAL MELANOMA: CLINICAL FEATURES AND SURGICAL OUTCOMES

Oral

Anguita R.*[1], Makuloluwa A.[2], Bhalla M.[2], Katta M.[2], Sagoo M.[2], Charteris D.[2]

[1]University Hospital Bern, Inselspital - Moorfields Eye Hospital ~ London - Bern ~ United Kingdom, [2]Moorfields Eye Hospital ~ London ~ United Kingdom

Purpose:

To describe and evaluate demographic, clinical features, prognostic factors, safety and rate of success of surgery and visual outcomes in patients with retinal detachment (RD) and choroidal melanoma (CM)

Methods:

A retrospective, observational case-series of patients with rhegmatogenous retinal detachment or combined tractional-rhegmatogenous retinal detachment in patients with choroidal melanoma over a period of 20 years (2002-2020)

Results:

21 patients were identified.2 patients excluded from final analysis due to incomplete information.CM location was mid-periphery in 11 eyes.Elevation was 4.0 mm and diameter was 11.0 mm.In 15 eyes the RD was rhegmatogenous and 4 eyes combined-TRD-RRD.
RRD occurred after the CM treatment in 14 eyes at a mean interval of 44.2 months.6 macula-on,PVD in 15 and PVR in 7 eyes.Vitrectomy was done in 15 eyes.Primary silicone-oil was used in 9 and gas in 7 eyes.logMAR BCVA at presentation was 0.71 and final BCVA was 1.5(P=0.01).The primary surgical success rate was 59%.No intraocular/extraocular tumor dissemination occurred. Mean follow-up was 66 months.

Conclusions:

RRD in patients with Choroidal melanoma is uncommon but requires multidisciplinary management.Anatomical results are favourable but visual outcomes are poor due to a combination of factors related to melanoma treatment,macular retinal detachment and PVR. Vitrectomy as a surgical intervention for RD appears to be safe in terms tumour dissemination.

Abstract 85

SURGICAL TECHNIQUE FOR REPAIR OF RETINAL DETACHMENT WITH EXTENSIVE PVR (CLOSED FUNNEL CONFIGURATION) IN CHILDREN AND YOUNG ADULTS

Oral

Habib A.*, Mansour A.

Ain Shams University ~ Cairo ~ Egypt

Purpose:

To describe a surgical technique and tips for management of retinal detachment (RD) with extensive proliferative vitreoretinopathy (PVR) (closed funnel configuration) in children and young adults

Methods:

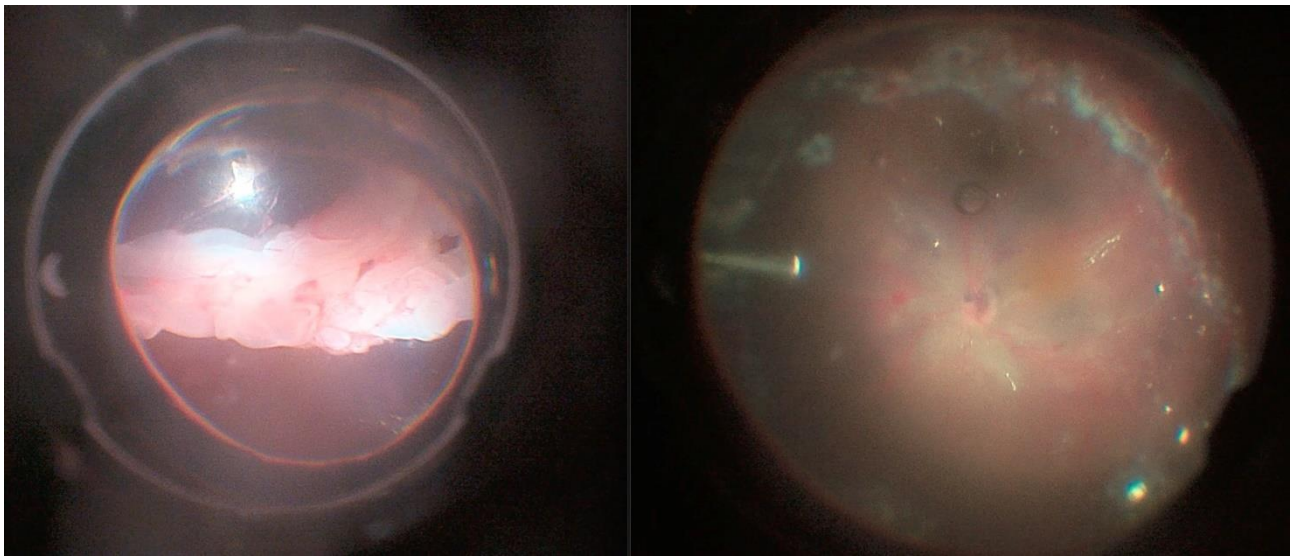
Eight eyes of 8 children and young adults with closed funnel RD were included in this retrospective case series. A similar surgical technique was followed in all cases. The technique consisted of lensectomy, core vitrectomy, epiretinal membrane removal, 360 degrees retinectomy, subretinal membrane removal, perfluro-carbon liquid injection, internal limiting membrane removal, 360 degrees laser barrage and silicon oil injection.

Results:

Analyzing the data showed, seven of the patients were males, 1 was female. Mean age was 11 years (range 3-23). Causes of RD were traumatic (n:4) and high myopia (n:3). Preoperative best corrected visual acuity (BCVA) ranged from light perception (LP) to hand motion (HM) vision. Postoperative BCVA ranged from counting fingers at 50 cm to 0.2.
Three patients experienced 1 re-detachment which was repaired. All patients ended up with flat retinae after at least 6 months of follow up.

Conclusions:

The proposed surgical technique for closed funnel RD is reproducible and effective. We recommend this attempt for repair of severe complicated forms of RD in order to achieve retinal reattachment and to gain at least ambulatory vision for fear of the other eye suffering the same fate.



Abstract 157

MANAGEMENT OF A 2-YEAR-OLD CHILD WITH MACULAR FOLD AND EXTENSIVE RETINOSCHISIS WITH PARS PLANA VITRECTOMY AND INNER FLAP RETINECTOMY

Oral

Agarwal A.*, Ghazi N., Khan A.

Cleveland Clinic Abu Dhabi ~ Abu Dhabi ~ United Arab Emirates

Purpose:

To report an unusual case and surgical management of a 2-year-old child with bilateral retinoschisis, retinal neovascularization and macular retinal fold

Methods:

Case report with surgical video

Results:

A 2-year-old boy was brought with complains of left eye crossing and poor fixation. The child was born of a non-consanguineous marriage at full-term. Examination under anesthesia revealed bilateral retinal vascular telangiectasia, superficial hemorrhages, retinal neovascularization (right eye), and a macular fold with retinoschisis involving the inferior retina (left eye). Fluorescein angiography revealed telangiectatic vessels and neovascularization. Familial exudative vitreoretinopathy was ruled out with genetic testing. Due to the macular fold in left eye, pars plana vitrectomy with inner flap retinectomy and laser photocoagulation was performed. The child was able to fixate with the left eye after 3 months.

Conclusions:

In patients with a extensive retinoschisis involving the macula, procedures such as pars plana vitrectomy and inner flap retinectomy may be beneficial.

Abstract 44

DO DAILY ACTIVITIES IMPACT GAS TAMPONADE – RETINA CONTACT AFTER PARS PLANA VITRECTOMY? AN EXPERIMENTAL AND COMPUTATIONAL FLUID DYNAMICS STUDY

Oral

Rossi T.*

IRCCS Polilclinico San Martino ~ Genova ~ Italy

Purpose:

To measure the amount of retinal surface wet by aqueous as a result of fluid sloshing consequent to eye and head acceleration due to daily activities and as a function of gas fill, after pars plana vitrectomy

Methods:

Computational fluid dynamics was used to model the vitreous chamber and acceleration imposed to the vitreous chamber content by daily activities such as the eye saccade, standing up from sitting, turning head and braking car. Eye model previously validated simulated gas fill between 0% and 100%. The amount of retinal surface steadily in contact with air, gas and alternatively in contact with gas and aqueous as a result of fluid sloshing was determined at rest and for each considered activity.

Results:

Activities significantly impacted the retinal surface affected by sloshing: standing up determined the largest area of wettable retina, followed by car braking, rotating the head and ocular saccade. The extension of retina affected by aqueous sloshing was not significantly affected by gas fill. Standing up exposes the largest retinal surface to aqueous contact. Regardless of gas fill percentage, all activities determined a significant increase of wet retina. The mean percentage of “wettable” retina during all activities was 13%-16%. Car braking induced a significantly higher shear stress that any other activity ($p<0.05$). Pulse was significantly different among activities ($p<0.001$).

Conclusions:

Regardless of patients' compliance, daily activities increase significantly by an 1average 15% the amount of retina in contact with aqueous. Shear stress induced by fluid sloshing during such activities exceeds retinal adhesion force and may explain fluid leakage into the subretinal space, retinal detachment and retinal shifting.

Abstract 43

SILICONE OIL TAMPONADE REMOVAL: WHICH TECHNIQUE IS MORE EFFECTIVE? AN X-RAY PHOTOEMISSION SPECTROSCOPY STUDY

Oral

Rossi T.*

IRCCS Ospedale Policlinico San Martino – Genoa, Italy ~ Genoa ~ Italy

Purpose:

to compare the efficacy of two surgical techniques used to remove silicone oil (SiO) emulsion tamponade after pars plana vitrectomy: triple Air-Fluid exchange (AFX) and BSS Lavage (BSSL).

Methods:

X-ray photoemission spectroscopy measured silicon content of the dry residue of fluid samples taken during AFX and BSSL. Ten patients underwent AFX and 5 BSSL, 3 fluid samples were taken per each patient and the dry residue of 10 drops per each sample were analysed. A fluid sample from a patient who never received SiO tamponade was also analysed to set a “blank” sample.

Results:

Patients’ demographics showed no significant difference. Samples 1 of the two groups contained comparable silicon content while samples 2 and 3 of AFX group contained more silicon that BSSL Group (15.0 ± 0.1 and 12.0 ± 0.9 for AF group Vs 10.7 ± 1.4 and 5.2 ± 0.6 for BSSL group, respectively; $p<0.05$). The cumulative amount of silicon in sample 1+2+3 was higher for AFX group (42.3 ± 1.6 Vs 32 ± 2; $p<0.0001$). Average silicon content ratio between consecutive samples was significantly higher for AFX group compared to BSSL group (0.90 ± 0.01 Vs 0.58 ± 0.06; $p=0.006$).

Conclusions:

Triple AFX removed more silicon than triple lavage. The eyewall actively retains silicon emulsion establishing a dynamic relation with the dispersion silicon content and does not behave as a neutral container.

Abstract 82

PNEUMATIC RETINOPEXY FOR SELECTED CASES OF RETINAL DETACHMENT: A THIRTEEN YEARS RETROSPECTIVE SINGLE- CENTER STUDY

Poster

Cuna A.*[1], Pellegrini F.[2], Foltran F.[2], Pellegrini M.[3]

[1]De Gironcoli Hospital ~ Conegliano (TV) ~ Italy, [2]Santa Maria degli Angeli Hospital ~ Pordenone ~ Italy, [3]ResMed Healthcare Group ~ Munich ~ Germany

Purpose:

The aim of this study is to retrospectively analyze the results of more than 100 cases of pneumatic retinopexy (PnR), a surgical option for the repair of rhegmatogenous retinal detachment (RD), performed at a single Hospital in Northern Italy during a period of thirteen years (2008-2020)

Methods:

102 patients with rhegmatogenous retinal detachment (among 1505 total cases of RD) were treated in a thirteen years period (2008-2020) with PnR by four different vitreoretinal surgeons. All the procedures consisted of intraoperative cryopexy or postoperative laser of the retinal break(s), paracentesis of the anterior chamber followed by transconjunctival pars plana injection of 0.5 ml undiluted SF6 and postoperative positioning. Follow up visits were scheduled at 1, 2, 3 days, and then as needed up to 12 months postoperatively

Results:

In a thirteen years period analysis we used PnR as the primary choice for the repair of RDs in 6.8 % of cases. The single operation success was 85.3%. The retina was reattached on average at 1.42 day postoperatively, and when it re-detached, it did so 1.69 month after surgery. Best corrected visual acuity improved from 0.49 (20/40) preoperatively to 0.91 (20/25) postoperatively. Complications were represented mainly by failure (14.7%) and new tears (6.9%), but excluding failure after surgery, the complication rate dropped from 28% to 13.7%. Failure rate positively correlated with the pseudophakic status of the eye

Conclusions:

Given the many advantages of this procedure, pneumatic retinopexy should be considered as a valuable alternative to vitrectomy and scleral buckle for the treatment of selected cases of retinal detachment

Abstract 175

OUTCOMES OF PARS PLANA VITRECTOMY FOR TREATMENT OF RETINAL DETACHMENT ASSOCIATED WITH FULL THICKNESS MACULAR HOLE FOLLOWING INTRAVITREAL TISSUE PLASMINOGEN ACTIVATOR AND GAS INJECTION FOR TREATMENT OF SUBMACULAR HAEMORRHAGE

Oral

Sabatino F.*[2], Jasani K.[1]

[1]Manchester Royal Eye Hospital ~ Manchester ~ United Kingdom, [2]Norfolk & Norwich University Hospitals NHS Foundation Trust ~ Norwich ~ United Kingdom

Purpose:

To report the anatomical and functional outcomes of pars plana vitrectomy (PPV) for management of retinal detachment (RD) associated with full thickness macular hole (FTMH-RD) following recombinant intravitreal tissue plasminogen activator and gas injection (tPA and gas) for treatment of submacular haemorrhage (SMH).

Methods:

Single surgeon (FS), retrospective case reports of 2 patients who developed FTMH-RD following tPA and gas for treatment of SMH. SMH was caused by eccentric choroidal neovascularization (CNV) in patient 1 and by wet age-related macular degenerative CNV in patient 2. Patient 1 underwent PPV with silicone oil tamponade, whereas patient 2 underwent PPV, internal limiting membrane (ILM) flap and gas tamponade.

Results:

Preoperative visual acuity was hand motion in both patients. Retinal reattachment and FTMH closed was achieved in both patients. Postoperative visual acuity was 1.06 logMAR in patient 1 and 1.06 logMAR in patient 2 at six months postoperatively.

Conclusions:

FTMH-RD is rare following intravitreal tPA and gas for treatment of SMH. PPV is effective in improving visual acuity, displacing SMH and closing FTMH in these scenarios. Larger studies are needed to investigate the incidence of FTMH-RD following intravitreal tPA and gas and confirm whether ILM surgery provides additional advantages.

Abstract 32

STRENGTH ADHESION OF CHORIORETINAL TISSUES AFTER THE INFLUENCE OF HIGH-FREQUENCY MICROSURGICAL ELECTRIC WELDING WITH SUPRACHOROID ACCESSES.

Poster

Saoud O.*[1], Sergiienko A.[2], Turchyn M.[1], Umanets M.[2], Lytvynchuk L.[3]

[1]Ternopil National Medical University ~ Ternopil ~ Ukraine, [2]~ Ukraine, [3]Justus Liebig University Giessen ~ Giessen ~ Germany

Purpose:

To evaluate the strength adhesion of chorioretinal tissues, after the influence of high-frequency microsurgical electric welding, with suprachoroid accesses in order to accelarate the adhesion of tissues in retinal detachment.

Methods:

The study was performed on 52 rabbits (104 eyes), which were divided into 4 groups:10-12 Volt, 12-14(V),14-16 (V),and a control group.Fragment of the eye wall tissue containing the retinopexy was isolated into five separate groups:1 hour,3 days,1 week,2 weeks,and 1 month.The fragment was fixed to the weighing platform of an analytic electronic scale,so that the place of the welding of suprachoroid was in the center of the fragment.A nylon suture (10–0)passed through the retina was elevated by a biomechanical force elongation tester.The reduction in weight at the time of retinopexy rupture was registered as a measure for retinopexy adhesion strength.

Results:

After the use of local suprachoroidal high-frequency electric welding with a frequency of 66 kHz using three voltage modes, the strength of chorioretinal adhesion was significantly higher compared with chorioretinal adhesion on the intact retina (control group).In the early post-exposure period (up to 2 weeks), when using the 10-12 V, the strength of the chorioretinal junctions was higher compared to the other higher voltage parameters (12-14 V, 14-16 V) .A month after the suprachoroid electric welding was conducted, no significant difference was indicated between the groups.

Conclusions:

HFECW with suprachoroidal accesses allows immidiatly strong chorioretinal adhesion ,and could reduce the complications of vitreoretinal surgery.

Abstract 137

LONG-TERM CLINICAL EVALUATION OF RETINITIS PIGMENTOSA (RP) PATIENTS IMPLANTED WITH A NOVEL EPIRETINAL PROSTHETIC DEVICE – INTERIM RESULTS

Oral

Ehrlich R.*

Ophthalmology department, Rabin medical center and Sackler Faculty of Medicine Tel Aviv University, Israel. ~ Tel Aviv ~ Israel

Purpose:

A novel autonomous infrared powered epiretinal prosthetic device with intra-retinal electrodes, the NR600, has been implanted in end-stage RP patients as part of an ongoing multi-center study. The study objectives were to demonstrate safety of the NR600 System and to evaluate the performance of the device in providing visual perception

Methods:

The Implant is delivered into the eye through a limbal incision and is fixed to the ciliary sulcus. Once secured, the helical structure holding the device is released and the implant is guided to the macula. Post 2-4 weeks recovery, the device is activated using infrared Glasses. Stimulation is uniquely optimized per patient, followed by perception training at the clinic and at patient's home environment. The primary safety endpoint was defined as the rate and severity of SAEs and the performance endpoints include grating acuity, object localization, quality of life questionnaires and Activities of Daily Living tests.

Results:

Nine implanted patients, mean age 66.6±8.0 years. All tolerated the procedure well, demonstrating good and fast recovery (follow-up time 14.6 ±10.2 months). The eyes remained clear, the implant system free of tissue debris and no retinal detachments or subretinal hemorrhages were observed. Two patients experienced possibly procedure/device related SAEs (visual hallucinations followed by psychological decompensation; elevated IOP that required IOL repositioning). Stimulation thresholds were typically low, 6.5±2.5μA across all patients, supporting the concept of ultra-low retinal activation with penetrating electrodes. The NR600 system enabled otherwise severely visually impaired patients- figure identification, object discrimination and good orientation and mobility abilities.

Conclusions:

The interim results of the study establish safety of the NR600 prosthesis and positive efficacy for otherwise blind patients. It demonstrates that the NR600 can be implanted chronically in humans, the long-term safety results are acceptable, and that the stimulation of the retina can elicit visual percepts.

Abstract 195

DOES CHOROIDAL THICKNESS PREDICT PERSISTENT SUBRETINAL FLUID AFTER RHEGMATOGENOUS RETINAL DETACHMENT REPAIR? A RETROSPECTIVE STUDY WITH FELLOW EYE COMPARISON.

Oral

Albanese G.M.[1], Visioli G.*[1], Iannetti L.[2], Giovannetti F.[1], Armentano M.[1], Romano E.[1], Macario F.[3], Gharbiya M.[1]

[1]Sapienza Università di Roma ~ Roma ~ Italy, [2]Policlinico Umberto I ~ Rome ~ Italy, [3]Humimed ~ Bergamp ~ Italy

Purpose:

To evaluate whether choroidal thickness (CT) is associated with persistent subretinal fluid (pSRF) after simple primary rhegmatogenous retinal detachment (RRD) repair.

Methods:

This single-centre, retrospective, observational study included patients who underwent RRD repair with at least 12-month follow-up. Preoperative and postoperative parameters were evaluated for association with pSRF. CT measurements were obtained at the central 1-mm area on enhanced-depth-imaging (EDI)-OCT scans, using a semiautomatic method. Multiple logistic regression analyses were assessed to determine predictive factors for pSRF.

Results:

Overall, 100 eyes of 100 patients, mean age of 59.9±12.6 years were included. pSRF was found in 21.0% of eyes and resolved over time in 85.7% of eyes at 12 months. The pSRF group showed lower mean choroidal and RPE thickness values as compared to those without pSRF($p< 0.05$). A significant correlation was found between pSRF occurrence and choroidal thinning($p=0.02$). After multiple regression analyses, macula-off RRD($p=0.005$) and scleral buckling(SB) technique($p=0.001$) were retained as final predictors for pSRF. In macula-off SB eyes, detachment duration was the only factor associated with pSRF($p=0.046$). There were no significant differences in best-corrected visual acuity outcomes.

Conclusions:

Patients with pSRF showed lower choroidal and RPE thickness as compared to those without pSRF. CT did not turn out to be a final predictor for pSRF, as this was mainly associated with macular involvement, surgical technique, and detachment duration.

Abstract 81

A PHASE 1/2A STUDY USING AUTOLOGOUS INDUCED PLURIPOTENT STEM CELL DERIVED RETINAL PIGMENT EPITHELIUM FOR TREATMENT OF ADVANCED DRY AGE RELATED MACULAR DEGENERATION

Oral

Amir K.*[1], Shilpa K.[2], Juan A.[2], Francesca B.[2], Irina B.[2], Mandeep S.[1], Steve C.[3], Henry W.[2], Mitra F.[2], Teresa M.D.Q.C.[2], Shekar J.[2], Arvydas M.[2], Ruchi S.[2], Kapil B.[2]

[1]Johns Hopkins University ~ Baltimore ~ United States of America, [2]National Eye Institute ~ Bethesda ~ United States of America, [3]Charles Retina Institute ~ Germantown ~ United States of America

Purpose:

To report the successful subretinal surgical placement of an autologous induced pluripotent stem cell-derived retinal pigment epithelium (iPSC-RPE) implant in a subject with geographic atrophy (GA) secondary to advanced, dry age-related macular degeneration (AMD).

Methods:

A Phase 1/2a study assessing the safety and preliminary efficacy of subretinal, autologous iPSC-RPE implant for treatment of AMD is being conducted at the National Eye Institute. The study will enroll the worse-seeing eye of up to 20 subjects aged 55 years or older with GA and best corrected visual acuity of 20/80 or worse. Detailed inclusion criteria are online (NCT04339764). Each subject will receive one 2x4mm implant consisting of autologous iPSC-RPE monolayer on a biodegradable scaffold intended to straddle the border of GA. Surgery is performed using pars plana vitrectomy approach and a custom investigational injector.

Results:

An 89 year old male with severe, advanced, bilateral GA resulting from AMD underwent successful iPSC-RPE implant placement in their worse-seeing eye (BCVA 20/125). The surgery was performed as planned using a commercially available 23 gauge PPV system and intraoperative OCT (iOCT) to assist with targeted subretinal hydrodissection overlying GA. The implant was placed in the subretinal space straddling the border of GA. Sulfur hexafluoride gas tamponade was used. A single dose of intravenous Solumedrol was administered immediately before surgery without oral immunosuppressive medication. No serious adverse events have been reported resulting from the surgical procedure or implant placement.

Conclusions:

Targeted subretinal delivery of an autologous iPSC-RPE straddling the border of GA in subjects with severe, advanced dry age-related macular degeneration is feasible. Efficacy and safety of the surgery and implant will be assessed at one year in this ongoing study.

Abstract 45

ROBOT-ASSISTED SUBRETINAL DRUG DELIVERY: FIRST-IN-HUMAN STUDY

Oral

Cehajic--Kapetanovic J.*[1], Xue K.[1], Edwards T.L.[1], Meenink T.[2], Beelen M.[2], Naus G.[2], De Smet M.[2], Maclaren R.[1]

[1]University of Oxford ~ Oxford ~ United Kingdom, [2]Preceyes BV, A Carl Zeiss Meditec AG ~ Eindhoven ~ Netherlands

Purpose:

To report the results of a first-in-human study using a robotic device to assist subretinal drug delivery in patients undergoing vitreoretinal surgery for macular haemorrhage.

Methods:

This was double-armed, randomized controlled surgical trial (ClinicalTrials.gov: NCT03052881) performed at the Oxford Eye Hospital, Oxford University Hospitals NHS Foundation Trust, Oxford, United Kingdom. In total, 12 participants with acute sub-foveal haemorrhage were recruited. After standard vitrectomy, subretinal injection of tissue plasminogen activator (TPA) was performed by either robot-assisted or conventional manual technique under local anaesthesia. The robotic part of the procedure involved advancement of a cannula through the retina and stabilizing it during foot-controlled injection of up to 100 µL of TPA solution. We assessed surgical success, duration of surgery, adverse events, and tolerability of surgery under local anaesthesia.

Results:

The procedure was well tolerated by all participants and safely performed in all cases. Total duration of surgery, time taken to complete the injection, and retinal microtrauma were similar between the groups and not clinically significant. Subretinal haemorrhage was success-fully displaced at 1-month postintervention, except for 1 control subject, and the median gain in visual acuity was similar in both arms.

Conclusions:

This first-in-human study demonstrates the feasibility and safety of high-precision robot-assisted subretinal drug delivery as part of the surgical management of sub-macular haemorrhage, simulating its potential future application in gene or cell therapy.

Abstract 199

SAFETY OUTCOMES OF 25 AND 27-GAUGE 20000 CUTS-PER-MINUTE PARS PLANA VITRECTOMY

Oral

Barca F.*[1], Pacini B.[1], Dragotto F.[2], De Angelis L.[1]

[1]Piero Palagi Hospital ~ Florence ~ Italy, [2]University of Florence ~ Florence ~ Italy

Purpose:

To report safety outcomes of pars plana vitrectomy using a 25 and 27-gauge, 20000 cut per minute vitrectomy probe among eyes with common surgical indications.

Methods:

Retrospective case series of 20 yes undergoing primary pars plana vitrectomy (PPV) for common vitreo-retinal diseases (Macular Holes, Epiretinal Membranes, Vitreous Hemorrhages, Retinal Detachments) at the ophthalmology department of Piero Palagi Hospital, Florence. Exclusion Criteria were history of prior PPV, glaucoma and high myopia. Main outcome measures were: intra- and postoperative complications, adverse events up to 3 months after surgery, rate of achieving surgical objectives.

Results:

Surgical objectives were achieved in all eyes. There were no intraoperative complications and we found no adverse events during the 3 months follow-up. The average surgical time was comparable to that of other systems.

Conclusions:

Twenty-thousand cut per minute vitrectomy system effectively and safely performs common vitreoretinal procedures.

Abstract 41

IMT-SAMSARA IMPLANT: FROM SCREENING TO REHABILITATION OUR PRELIMINARY EXPERIENCE

Oral

Sasso P.*, Savastano A., Francione G., Sammarco L., Ferrara S., Gambino G., De Vico U., Caporossi T., Minnella A.M., Rizzo S.

Policlinico Gemelli ~ Rome ~ Italy

Purpose:

SING (Smaller-Incision New-16 Generation) implantable miniature telescope (IMT), is the first approved surgical treatment for visually impaired people due to end-stage age-related macular degeneration (AMD).
We reported our preliminary results in 11 real-world IMT implanted patients with the commercial device (6months follow-up data), defining screening, surgical techniques and rehabilitation approach.

Methods:

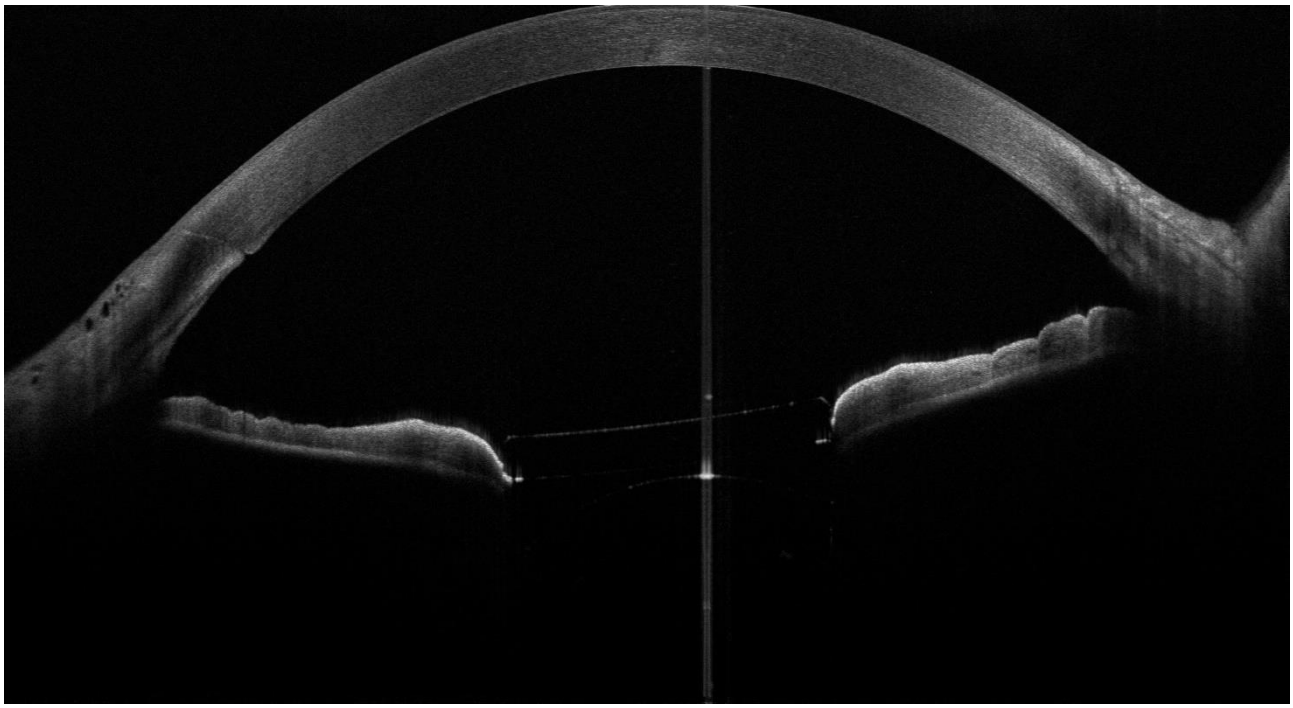
30 AMD patients with bilateral central vision loss (17 M, 13 F) were evaluated to be included for the implant. Inclusion criteria are patients with cataract and bilateral geographic atrophy or disciform scar, ≥ 55 age, good peripheral vision, BCVA, 0.6-1.6 LogMar, bilaterally, 5 letters gain with the telescope, CA ≥ 2.5 mm.
Surgery was performed in 11 subjects and rehabilitation protocol training was applied by measuring best corrected visual acuity, BCVA, reading acuity, RA, fixation stability, and reading speed, OCT, endothelial biomicroscopy. Moreover a series of customizable exercises were performed at the hospital and at home monocularly and binocularly.

Results:

At 6-months of follow-up BCVA improved from 0.875 LogMar to 0.625. Reading acuity was 0.4 LogMar in all patients. Reading speed improved of 51.7% after training. Mean accuracy, reaction time and fixation stability were significantly better after training. No patient developed complications as endophthalmitis or persistent inflammation. Only one patient had transient inflammation reduced with topic therapy.

Conclusions:

AMD patients receiving SING-IMT implant surgery and rehabilitation intervention showed an improvement of visual functions on real-word task. Our experience with the IMT in the real-world setting provides evidence of the effectiveness of multidisciplinary approach for visually impaired subjects from precise surgical technique, careful patient selection and postoperative rehabilitation.



Abstract 222

THREE-DIMENSIONAL VISUALIZATION SYSTEM FOR VITREORETINAL SURGERY: RESULTS FROM A MONOCENTRIC EXPERIENCE AND COMPARISON WITH CONVENTIONAL SURGERY

Poster

Nicolosi C.*[1], Vicini G.[2], Soloperto F.[1], Sarati F.[1], Giattini D.[1], Tito F.[3], Bacherini D.[1], Giansanti F.[1]

[1]Eye Clinic, Neuromuscular and Sense Organs Department, Careggi University Hospital, Florence, Italy ~ Florence ~ Italy, [2]Department of Neurosciences, Psychology, Drug Research and Child Health (NEUROFARBA), University of Florence, Florence, Italy ~ Florence ~ Italy, [3]Department of Biomedical and Surgical Sciences, Section of Ophthalmology, University of Perugia, S. Maria della Misericordia Hospital, Perugia, Italy ~ Perugia ~ Italy

Purpose:

To describe the experience of our Centre (Careggi University Hospital, Florence, Italy) in using heads-up three-dimensional (3D) surgical viewing system in vitreoretinal surgery, making a comparison with the conventional microscope surgery.

Methods:

We retrospectively analyzed data of 240 patients (240 eyes) with surgical macular diseases (macular hole, epiretinal membrane), retinal detachment or vitreous hemorrhage, who underwent vitreoretinal surgeries by means of NGENUITY 3D Visualization System (Alcon Laboratories Inc.), in comparison with 240 patients (240 eyes) who underwent vitreoretinal surgeries performed with a conventional microscope. All surgeries were performed with standardized procedures, by the same surgeons. We analyzed data over a follow up period of 6 months, comparing the surgical outcomes (best-corrected visual acuity, anatomical success rate and postoperative complication rate) between the two groups.

Results:

3D-group included 74 patients with retinal detachment, 78 with epiretinal membrane, 64 with macular hole and 24 with vitreous hemorrhage. There were no significant differences in demographic and clinical characteristics between 3D-group and conventional group. We found no significant differences in outcome measures at three and six months follow up between the two groups (p-value ≥ 0.05 for all comparisons). Surgery durations were similar between the two groups.

Conclusions:

In our experience heads-up 3D surgical viewing system provided comparable functional and anatomical outcomes, in comparison with conventional microscope surgery, proving to be a valuable tool for vitreoretinal surgery in the treatment of different retinal diseases.

Abstract 224

VITRECTOMY FOR WAR EYE INJURIES

Oral

Grubnyk N.*, Sidak--Petretskaya O., Krasnovid T., Drozhzhina G.

The Filatov Institute of eye diseases and tissue therapy of NAMS of Ukraine ~ Odesa ~ Ukraine

Purpose:

to study opportunities of vitrectomy of eye injuries during the war in Ukraine.

Methods:

We observed 18 traumatized eyes of 13 patients (-11, civil-2). Monolateral eye injury - 8, bilateral-5. Closed globe injury -5 eyes, open eye injury - 13. Terms of admission to the institute for highly specialized assistance (2nd stage of treatment) from the moment of injury: 2 days - 1 patient, 5 days - 1, 7-30 days -11. Visual acuity at admission: pr.l.incertae - 4 eyes, pr.l.certae - 0.02 - 11 eyes, 0.1 - 1, 1.0 - 2.

Results:

Contusion of the eyeball was revealed in closed injury in 5 eyes. Penetrating injury of the eyeball - 7, IOFB in the posterior segment of the eye – 6 were revealed in open globe injuries. Traumatic retinal detachment was detected in 5 eyes, ciliochoroidal detachment-5, retinal break - 1, secondary macular degeneration-4. Phthisis bulbi-3. The following surgical interventions were performed in the institute: PPV in 10 eyes (PPV with removal of IOFB-6, 4 of them in combination with PEC and 1 - keratoplasty, PPV for retinal detachment-2, PPV -2), PEC-1, removal of corneal foreign bodies – 1 and delayed PS.

Conclusions:

72% of the eyes required vitreoretinal intervention, but only in 55% cases it was performed due to late treatment and the development of phthisis bulbi. At the 2nd stage of treatment, reconstructive vitreoretinal surgery is the main tratment.

Abstract 69

TRAUMATIC CHOROIDAL DETACHMENT - ONE BABY RETINA SURGEON'S NIGHTMARE

Poster

Kim J.*

Department of Ophthalmology, CHA Bundang Medical Center, CHA University School of Medicine ~ Seongnam ~ Korea, Republic of

Purpose:

I would like to report that I have had difficulties with vitrectomy due to traumatic choroidal detachment and have resolved it.

Methods:

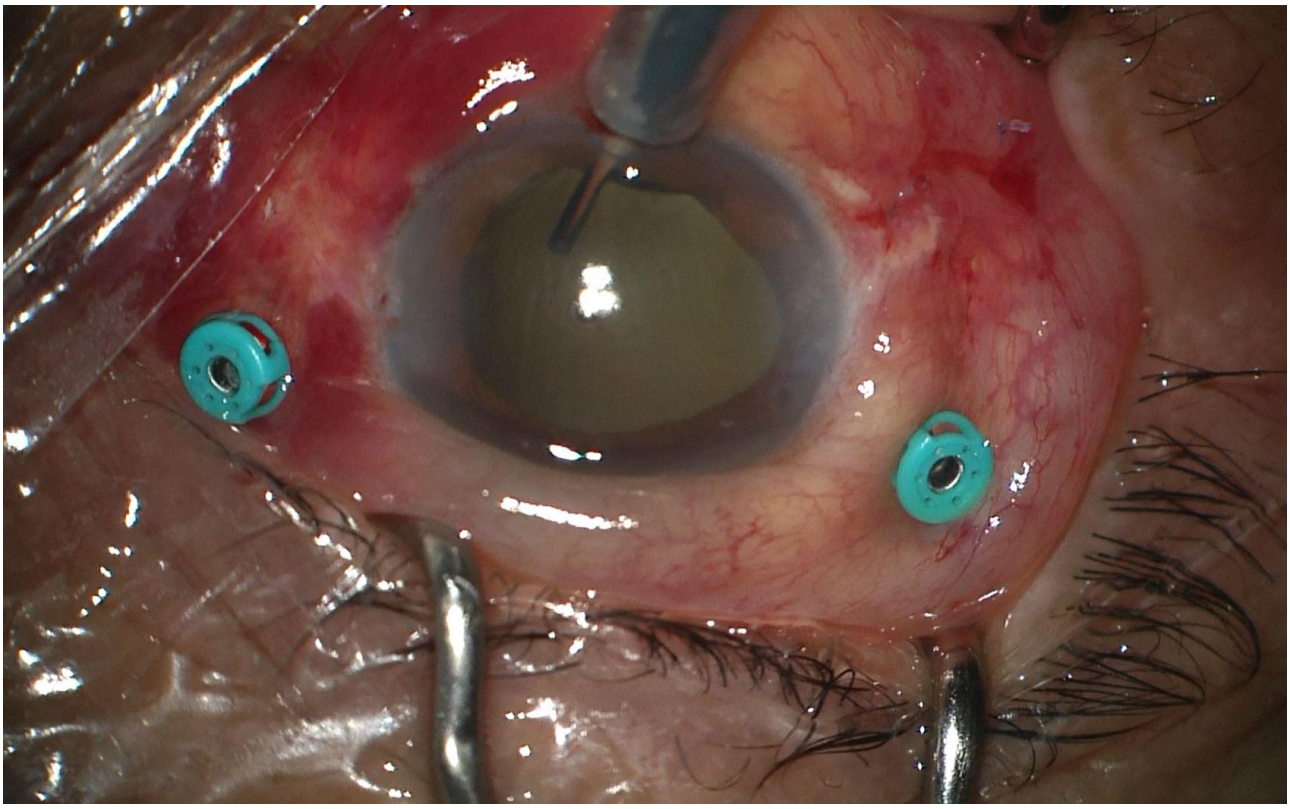
A 65-year-old man was hit in the right eye by a rubber hose and addressed the vision loss that had occurred. The visual acuity was HM and the intraocular pressure was 12 mmHg. Along with conjunctival lacerations, prolapsed vitreous and traumatic hyphema, traumatic mydriasis were observed in the anterior chamber, and traumatic lens dislocation into vitreous cavity was observed. Fundus was not observed, and there was no RD peak by USG. Since surgery was not immediately possible due to corneal edema, a delayed vitrectomy was decided.

Results:

3 cannulas were plugged in first and anterior vitrectomy and blood clot removal were performed in the anterior chamber. After connection of the infusion cannula and during vitrectomy, the eyeball was not maintained and persistent choroidal detachment was occurred. It was found that there was traumatic choroidal detachment in the area where the infusion cannula was located, so that no fluid entered. Despite repeated sclerotomy in other areas, no fluid entered the vitreous cavity due to choroidal detachment. I made 6 o'clock corneal incision and located infusion cannula. Finally, I could perform the vitrectomy.

Conclusions:

When operating on trauma patients, traumatic choroidal detachment must be kept in mind. When performing a vitrectomy, the tip of the infusion cannula must be checked.



Abstract 58

TWO-STEP SURGICAL APPROACH IN A SEVERE PERFORATING EYE INJURY

Oral

Sousa D.*

Royal Victorian Eye and Ear Hospital ~ Melbourne ~ Australia

Purpose:

In a perforating eye injury, it might not be possible to close a very posterior wound.
We aim to present and discuss a two-step surgical approach to repair a nail gun-induced perforating open globe injury.

Methods:

Case-report and surgical video presentation.
A 20-year-old male presented to emergency department after a perforating eye injury using a nail gun. At presentation, visual acuity was light perception, a full hyphema was observed and a large scleral-limbal entry site was identified with choroid and vitreous loss. The CT-scan revealed the location of a 32-mm long nail within the globe until the apex of the orbit. Two surgeries will be presented: i) the primary open globe repair along with, lensectomy, partial vitrectomy and removal of the intraocular and orbital foreign body, and ii) the secondary vitrectomy.

Results:

The surgical approach consisted in two steps. Firstly, immediate primary globe repair and foreign body removal, along with a lensectomy and partial vitrectomy only. The posterior vitreous was left in situ on purpose to allow for healing of the posterior wound(which would have been impossible to suture). Two weeks after, a secondary vitrectomy was performed - a partial posterior vitreous detachment and less inflamed eye allowed for a much safer surgery. The posterior wound was surrounded by endolaser and eye left fluid-filled. At 6 weeks follow-up, the patient's pinhole visual acuity is 6/24, with a comfortable eye and attached retina.

Conclusions:

In cases of a perforating eye injury with a very posterior exit wound, a two-step approach – i.e., an initial primary open globe repair and removal of foreign body only, followed by a full vitrectomy 10-14 days after is likely to be a safer and sensible approach.

Abstract 116

PERFLUOROCARBON LIQUID-ASSISTED VITREO-DISSECTION IN EYES WITH FIRMLY ADHERENT POSTERIOR HYALOID

Oral

Abdelaziz I.*

AlMashreq ~ Cairo ~ Egypt

Purpose:

To describe a modification on the “mega Weiss-ring” technique, to assist in induction and propagation of posterior vitreous detachment (PVD) in cases with firmly adherent posterior hyaloid.

Methods:

After core vitrectomy, breaking into the posterior hyaloid face is made via active aspiration and cutting or a sharp dissection. This is followed by active and slow injection of perfluorocarbon liquid (PFCL) into the potential space between the posterior cortical vitreous and the neurosensory retina. A wave of PFCL propagates anteriorly causing “vitreo-dissection” of the peripheral cortical vitreous.

Results:

The technique was effective and safe in 4 cases with vitreoretinal traction syndrome, and 4 cases with diabetic tractional membranes.

Conclusions:

The technique can be considered as simple & relatively safe technique in cases with abnormal firmly adherent posterior hyaloid, when induction of PVD proves difficult.

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