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

Oral

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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.

