

Imaging of choroid in patients with thyroid eye disease

S.Theodoropoulou, R. Painter, R.Ford

Bristol Eye Hospital, University Hospitals Bristol Foundation Trust, UK

Aim: Thyroid Eye Disease (TED) is characterized by oedema, inflammation and enlargement of extraocular muscles, orbital connective tissue and fat. The aim of this study is to use OCT to investigate whether changes in orbital tissues alter the choroidal circulation and subfoveal choroidal thickness in patients with active TED.

Material & Methods: Patients with TED were evaluated prospectively. All subjects underwent ophthalmologic examination including visual acuity, intraocular pressure measurement, orbital and fundus examination, and CAS score. Patients were co-managed by an endocrinologist and most were euthyroid. Choroidal thickness was measured at the central fovea and around optic nerve using enhanced depth imaging-OCT (EDI-OCT). Furthermore, OCT Angiography was performed to all patients to image choroidal vessels at the central fovea. Mean sub-foveal choroidal vessel diameter was used as an indicator of choroidal blood flow.

Results: Experimental results with images from 28 eyes of 14 patients with different grades of TED were obtained. Choroidal architecture was imaged in all patients with mild or severe disease, and thickness analysed. Choroidal vasculature and layers were also depicted with OCT Angiography. The choroidal changes in patients with active disease correlated with clinical activity score and grade of disease. Changes in choroidal architecture might primarily be related to changes in orbital inflammation or fluctuations in orbital pressure.

Conclusion: EDI-OCT and OCT Angiography enable a precise qualitative and quantitative characterization of the choroidal layers and choroidal vasculature in eyes with TED. *In-vivo* evaluation of the choroid and vessels at variable depths may be potentially valuable in evaluating thyroid eye disease and assessing clinical activity and degree of 'hydraulic' disease. We believe that further investigations might confirm potential usefulness of choroidal imaging in identification of patients who would benefit from early intervention.