MORPHOLOGY OF TRABECULECTOMY FILTERING BLEBS USING ANTERIOR SEGMENT OPTICAL COHERENCE TOMOGRAPHY: A COMPARISON OF TWO METHODS

Rita Pinto Proença, Lívio Costa, Mariana Sá Cardoso, Arnaldo Dias-Santos, Joana Tavares Ferreira, Teresa Gomes, João Paulo Cunha

(Centro Hospitalar de Lisboa Central)

Introduction: Anterior segment imaging optical coherence tomography (AS-OCT) can be a useful aid in glaucoma surgery. Recent studies have shown its importance in both the preoperative morphologic evaluation of glaucoma patients as well as postoperative evaluation of filtering bleb functionality. Our purpose is to evaluate post-trabeculectomy filtering and non-filtering bleb characteristics in both time-domain OCT (TD-OCT, Visante™, Carl Zeiss) and spectral-domain OCT (SD-OCT, Heidelberg Spectralis® anterior segment module), assess the usefulness of AS-OCT in evaluating postoperative filtering bleb function and compare both methods results.

Material and Methods: Observational case series of 20 eyes of 20 patients who had undergone trabeculectomy in the last 4 years. Eyes were classified into 2 groups: failed blebs (FBs) and non-failed blebs (NFBs). Bleb structures were assessed with both TD-OCT and SD-OCT. Blebs were analyzed in terms of total height, wall thickness and reflectivity, microcysts, pattern, fluid filled cavity height, position and width of the filtration opening and correlation with IOP and slit lamp morphology.

Results: Of the 20 patients, 12 were male and 8 were female, with a mean age of 74.6 years (±7.99). Average preoperative intraocular pressure was 25.6mmHg and postoperative 13.58mmHg. Functioning blebs had significantly more intraepithelial microcyst density than failed blebs. Thicker bleb walls with lower wall reflectivity correlated with lower IOP. Larger fluid filled cavity height and hyporeflective area volume also correlated with successful blebs. Failed blebs revealed more scarring processes. A good degree of concordance was observed between slit lamp morphology and AS-OCT evaluation. A trend was observed towards a more defined characterization of bleb wall morphology in SD-OCT and a better visualization of deep scleral structures in TD-OCT.

Conclusion: AS-OCT is a non-contact, simple and reproducible method to analyze the morphology of trabeculectomy blebs. It may be useful in evaluating bleb functionality, aiding clinical evaluation and allowing an early identification of filtration failure.