Prospective analysis of non penetrating deep sclerectomy filtering bleb by anterior segment optical coherence tomography
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Purpose: To provide morphological details of nonpenetrating deep sclerectomy (NPDS) filtering blebs by spectral-domain anterior segment optical coherence tomography (AS-OCT) assessment, and analyze the correlation between postsurgical intraocular pressure (IOP) reduction and four different filtering bleb characteristics.

Methods: A total of 30 consecutive outpatients were included in this study. NPDS was performed in 20 eyes and combined surgery (phacoemulsification + NPDS) in 10 eyes. All surgeries were performed with an antimetabolite agent (mitomycin C 0.2 mg/ml) and the morphological bleb features were analyzed prospectively by AS-OCT in 1 week, 1, 3 and 6 follow-up. Blebs were imaged with a commercially available AS-OCT system (3D OCT 2000, topcon®) and correlation between IOP and the presence or absence of 4 qualitative parameters were analyzed: bleb wall reflectivity, subconjunctival microcysts (SMC), posterior episcleral fluid (PEF) and scleral lake (SL).

Results: Intraocular pressure decreased significantly from baseline (IOP 20.9 ± 4.7 mm Hg) at every time point (p < 0.001) with a mean IOP of 10.5 ± 5.6mm Hg, 13.9 ± 5.3 mm Hg, 14.2 ± 5.7mm Hg and 14.9 ± 5.5 mm Hg in 1 week, 1 month, 3 month and 6 month postoperative follow up respectively. There is also a significant reduction in the number of antiglaucomatous medications used in every visit from a previous base of 2.78 ± 0.6 to 0.0 at each time point (p< 0.001). Greater IOP reduction levels were not statistically correlated with any of the 4 qualitative bleb parameters analyzed in each of the follow-up. Nevertheless, postsurgical prospective analysis by AS-OCT of the bleb morphological features shows statistical differences in the frequency of these parameters. Presence of SMC, PFE and SL at 1 week: (90%, 90% and 6.7% respectively); at 1 month, presence of SMC, PFE and SL (88%, 88% and 16% respectively); at 3 months, presence of SMC, PEF and SL (66.7%, 61.1% and 55.6% respectively) and, finally, at 6 months, presence of SMC, PEF and SL (53.3%, 23.3% and 63.3% respectively).

Conclusions: NPDS is a safe, effective surgical procedure in reducing IOP but none of the qualitative parameters correlates with a greater IOP reduction, which could might mean a positive prognostic morphological indicator. AS-OCT is a useful tool for assessing the filtering bleb function in NPDS. Morphological features of the filtering bleb change dynamically in the first weeks of the glaucoma surgery and monitoring this by new imaging techniques permits a comprehensive study of the ocular tissues responses to the wound healing process.