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Anterior segment OCT and confocal microscopy can be predictive of the bleb failure of a new minimally invasive glaucoma surgery technique, the XEN implant (Aquesys)?

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Abstract

Purpose

Most of the minimally invasive glaucoma surgery (MIGS) procedures address the angle or the suprachoroidal space by the use of new implants (Glaukos, Ivantis, Transcend, MidiArrow) but their proper placement and the patency of the outflow pathways remains a matter of clinical experience. Aim of the study was to investigate if anterior segment OCT and confocal microscopy could add clinical informations of the long term health of the bleb obtained using a new collagen derived implant (XEN).

Methods

The device was implanted in 10 POAG patients (8 males/ 2 females, 64,5 mean age ±12,93 SD). IOP with GAT, AS-OCT (RTVue, Optovue), confocal microscopy (Heidelberg) were assessed one day, 1 week, 1 month and 6 months post-operatively. At the same time points, bleb morphology was evaluated by two masked observers. The bleb was defined as present, encapsulated, cystic or absent. The position and the presence of fluid were evaluated using the AS-OCT. The presence of subconjunctival cystic spaces was assessed by the confocal microscopy. Complete success was defined as mean diurnal IOP<18 mm Hg and qualified success as mean diurnal IOP<18 mm Hg on medication.

Results

Direct communication between the anterior chamber and the subconjunctival space was demonstrated in all patients intraoperatively by obtaining a bleb after intracameral injection of BSS. Mean IOP 1 day post-operatively was 14 mmHg (17 mmHg less than pre-operatively medicated IOP). The bleb was defined as present in all patients at 1 month by both observers. The track of the implant could be visualized using the AS-OCT . Subconjunctival fluid on OCT (fig.1) and cystic spaces on confocal microscopy could be demonstrated in 8 and 4 patients respectively at 1 month (fig.2). The 6 patients in which there was no evidence of subconjunctival cystic spaces at one month (fig 5), failed at 6 months.

Conclusions

This new MIGS implant present the advantage of allowing direct intraoperative assessment of the outflow from the anterior chamber to the subconjunctival space. AS OCT can be used in the immediate post-operative period to determine the correct position of the implant and the presence of subconjunctival fluid. The presence of conjunctival cysts assessed by confocal microscopy seems a predictive factor of medium term failure of the bleb.

Image Not Available

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Fig. 1.

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Fig. 2.

Keywords: 568 intraocular pressure • 550 imaging/image analysis: clinical • 596 microscopy: confocal/tunneling