Spectral Domain OCT to diagnose and monitor clinically inapparent Hypotony Maculopathy

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Introduction
Hypotony maculopathy has been reported to occur in about 20% of eyes having glaucoma filtering surgery especially with use of adjunctive anti-metabolites. If clinically inapparent or in eyes with inadequate fundal view, delayed diagnosis can compromise vision irreversibly. Spectral Domain OCT is an exciting new tool to monitor not only retinal but also glaucoma related pathology. 3-D software image rendering can complement clinical decision making as presented in this case.

Purpose
To report the use of spectral domain OCT technology (SD-OCT) with 2-D and 3-D imaging rendering to diagnose and plan treatment in a case of clinically inapparent hypotony maculopathy with visual symptoms.

Methods
- Single case report of an only-eyed patient with progressive optic disc cupping despite being on maximal medical treatment.
- At baseline the patient had moderate nuclear sclerotic cataract with 0.9 cupped disc and visual acuity of 0.3 LOGMAR (Snellen 6/12).
- Augmented Trabeculectomy with mitomycin-C was carried out. Post-op IOP’s were noted to be 8 mm , 6 mm and 6 mm Hg at day 1 , week 1 and week 2 follow up with a good filtering bleb.
- Persistent central blur was noted by the patient but deep AC but no clinical macular striae / folds. There was no evidence of trabeculectomy wound leak. Fundal view was poor because of moderate nuclear sclerotic and cortical cataract.
- Imaging with 3-D 1000 OCT (Topcon) and Spectrals were compared to show RPE irregularity and folds confirming subclinical hypotony maculopathy with RPE folds better appreciated on 3-D software rendered images.

Results
- Trabeculectomy bleb was revised and IOP adjusted to 11 mm Hg with 4 month follow up and confirmed by RPE regularity on OCT and symptomatic resolution.
- At baseline presentation the 2-D single B-scans through the fovea using either Topcon or Spectrals OCT machines did not explain the symptomatic deterioration, as shown figures 1 and 2. Full evaluation of the raster scans through the macula showed a better appreciation of the RPE irregularity. Topcon raster scan used 6 * 6 mm raster scans while Spectrals was viewed with 37 line scans through the macula, as shown in figures 3 and 4.
- 3-D rendering with use of advanced software options on Topcon 3-D 1000 machine (version 2.2) allowed excellent three dimensional visualization of the RPE folds through the macula resulting from hypotony that settled after bleb revision . IOP pressure improved and visual symptoms resolved.

Fig. 1. Topcon B Scans and Color Photograph. Poor macular details on colour photo noted. At baseline (middle) and 4 months post bleb revision(bottom) the B scans do not show any convincing RPE irregularity or folds.

Fig. 2. B scans at baseline and follow up. Slight RPE irregularity on Spectrals OCT imaging, RPE contour much improved 04 months post bleb revision.

Fig. 3. Hypotony maculopathy clearly visualized by series of six 3-D cropped and rotated views clearly showing Irregular and bumpy RPE (Images with Topcon 3-D 1000 OCT system).

Fig. 4. Following Bleb revision. Series of six 3-D scans cropped and rotated clearly show nearly smooth and non-bumpy RPE at 4 months follow up. (Images with Topcon 3D 1000).

Discussion
- SD-OCT is complementary and possibly diagnostic in cases with symptomatic but subclinical hypotony maculopathy. Our case had an only eye with significant nuclear sclerosis precluding adequate clinical view of the macula to evaluate macular folds.
- Discussion of the OCT scans with the patient and family greatly informed the management decision and helped as an objective follow up parameter following bleb revision.
- Lima et al have presented the largest series on use of SD-OCT for detecting subclinical hypotony maculopathy. Higher image resolution of SD-OCT clearly has an advantage over previous time-domain based OCT systems. Use of SD-OCT helps to diagnose and monitor subclinical cases of hypotony maculopathy as clearly shown by our case.

References