Comparative study of central corneal endothelial cell changes after trabeculectomy with mitomycin C alone or a combined procedure with phacoemulsification for cataract extraction.

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Purpose

To compare changes in central corneal endothelium characteristics after trabeculectomy with mitomycin C (MMC) alone or a combined procedure with phacoemulsification for cataract extraction.

Methods

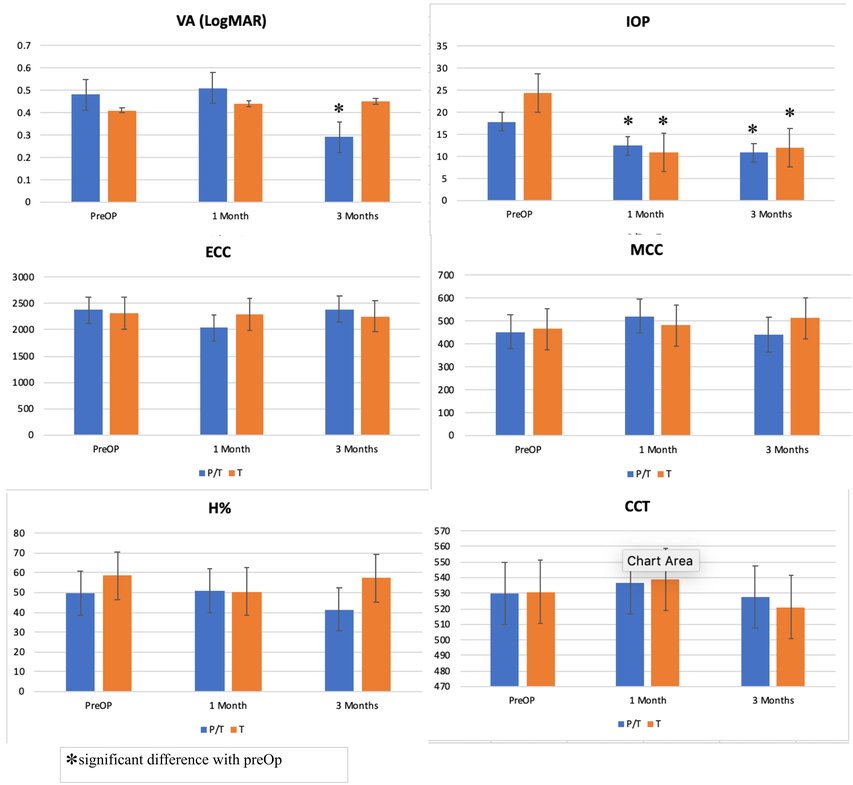
Changes in corneal endothelium in patients that underwent trabeculectomy with MMC or a combined procedure were prospectively evaluated. Corneal specular microscopy was performed at the central cornea using a non-contact specular microscope before surgery and 1 month and 3 months after surgery. The endothelial cell count (ECC), hexagonality of the endothelial cells (H%), central corneal thickness (CCT) and the mean central cell size (MCCS) of the cell areas were compared between the two groups.

Subjects

Phacotrabeculectomy	
No. of patients	18
Gender (M :F)	13 : 5
Age (Mean)	74.8
Diagnosis	
POAG	15
PXG	2
JOAG	1
Side operated (R: L)	6 : 12
MMC time (Secs)	95 (90 - 120)
Number of glaucoma drops used preoperatively	3.05
No. 5FU	0.44 (4-0)
Complications	2
Bleb Leak	1
Dislocated IOL	1
Trabeculectomy	
No. of patients	18
Gender (M :F)	6 : 12
Age (Mean)	63.7
Diagnosis	
POAG	14
SOAG	1
CACG	2
PXG	1
Side operated (R: L)	10 : 8
MMC time (Secs)	110 (90 - 120)
Number drops preop	3.06
No. 5FU	0.67 (4-0)
Complications	
Bleb Leak	8
Hypotony w/ Choroidals	1

Results

The phacotrabeculectomy study group comprised 5 women and 13 men [mean age 74.8 standard deviation (SD) 7.9] and the trabeculectomy only group comprised 6 men and 12 women (mean age 63.7 and SD of 10.8). 3- and 1-month follow-up was available for 11 patients and 15 patients respectively in the phacotrabeculectomy group and 15 and 17 respectively for the trabeculectomy group. We observed a significant difference (P = 0.44) in the postoperative VA at three months: phacotrabeculectomy patients improved -0.20 LogMAR units compared to no change (0.04 LogMAR units) in the trabeculectomy only group (P = 0.044). IOP was significantly lower (P = 0.0036 and P = 0.05 at the 1- and 3-month mark respectively) in the trabeculectomy-only group (-13.6 mmHg and – 12.5 mmHg compared to -5,4 mmHg and -6.95 mmHg). Regarding CCT, the trabeculectomy only group at 1 and 3 months did not present significant differeces (-9.8 μm compared to -2.3 μm with a P value of 0.76). There was no significant difference in the ECC between the two groups (P = 0.14), however, there was a tendency to a decrease in ECC in the phacotrabeculectomy group that is worth noting (-335 against -29 cells) 1 month after surgery. There were no differences in MCCS or H% at the 1- and 3-month postoperative marks in our study.



*significant difference with preOp

Discussion

To the best of our knowledge, this is the first report that has examined changes in corneal endothelium in patients that underwent trabeculectomy with MMC or a combined procedure with phacoemulsification. In our current study we demonstrated that phacotrabeculectomy and trabeculectomy only patients presented similar corneal characteristics 1 and 3 months after surgery. CCT, ECC, MCCS and H% were not significantly different between the two groups. This reproduces partially previous studies results such as that of Garcia et al[1] who observed a statistically significant central cell loss of 6.35% but no statistically significant difference in CV size and H % 3 months after trabeculectomy. These results, therefore, suggest a relative endothelial stability after glaucoma and combined surgery. With regard to the timepoint of ECC measurements, previous studies showed no significant progression of corneal endothelial cell loss from 1 to 3 months (7.2% to 8.7%), from 3 to 12 months (9.5% to 10%), or from 6 to 12 months (1.9% to 3.2%) after trabeculectomy with MMC,[2-4] indicating that most cell loss occurs intraoperatively or in an early postoperative period.

The main limitation of our study is the number of patients included, a larger sample could potentially confirm outlined trends in our study such as a decreased ECC in the phacotrabeculectomy group. Among other factors that may affect our results, it is possible that the area of the cornea evaluated at every examination might not have been exactly the same, despite using the same fixation target during each examination. Also, a longer follow up period could shed more light on the long term endothelial changes after these procedures.

Conclusion

Phacotrabeculectomy patients did not present significant differences in corneal cellular or morphological characteristics 1 and 3 months after surgery compared to Trabeculectomy-only patients. ECC, MCCS and H% were not significantly different between the two groups. The main limitation of our study is the number of patients included, a larger sample could potentially confirm outlined tendencies in our study such as a decreased ECC in the phacotrabeculectomy group.

References

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