

CORNEAL REMODELLING FOLLOWING CATARACT SURGERY: OCT ANALYSIS OF THE EFFECT OF INCISION SIZE ON WOUND ARCHITECTURE IN THE THREE MONTHS FOLLOWING SURGERY

Purpose: To characterise wound healing and corneal incision architecture with different keratome sizes in the three months following cataract surgery. **Method:** A prospective randomised study of 95 patients undergoing cataract surgery assigned to uniplanar clear-corneal temporal incision sizes of 2.20mm or 2.85mm was completed following formal ethics review. Incision position, length, angle, and leakage were recorded, in combination with total ultrasound energy and corneal thickness. Corneal topography and incision imaging using OCT was completed at one day, one week, one month and three months, postoperatively. Statistical analysis was completed using R statistical software.

Results: Endothelial wound gaping was observed in 63% (2.20mm keratome) and 45% (2.85mm keratome), p -value=0.03. Descemet's membrane detachments were observed in 57% (2.2mm keratome) and 40% (2.85mm keratome), p -value=0.01. Increasing phacoemulsification time was associated with Descemet's membrane detachment (p -value=0.02), endothelial wound gaping (p -value=0.03) and increased wound thickness (p -value=0.02). Endothelial wound gaping improved within the first month and wound retraction progressed from one to three months following surgery. Wound leakage was noted only in one case (incision angle=35.0°), overall mean incision angle was 25.1 ± 4.6°.

Conclusion: Increasing ultrasound energy and smaller incisions are associated with wound gaping and retraction that demonstrate corneal remodelling over three months following cataract surgery. Smaller incisions are associated with increased rates of Descemet's membrane detachment and increased localised corneal thickness in the postoperative period. Uniplanar incisions of 2.2mm and 2.85mm can be consistently constructed, do not leak and typically do not require hydration.