Selective suture removal for the management of post-keratoplasty graft astigmatism in keratoconus

Nasim Nouri*, Sepehr Feizi, Zahra Karjou
Shahid Beheshti University of Medical Sciences, Iran

Purpose: To evaluate the effect of selective suture removal on corneal graft astigmatism after keratoplasty in keratoconus.

Methods: This retrospective, comparative interventional case series enrolled 118 consecutive eyes of 118 patients who underwent corneal transplantation for keratoconus and had a graft astigmatism of ≥4 D. One or two interrupted sutures corresponding to the steep meridian were removed at each session based on keratometric astigmatism; one suture for astigmatism between 4 and 6 D and a pair of opposing sutures for astigmatism >6 D. The patients were re-examined in 1 to 2 months, and suture removal was repeated until a keratometric astigmatism of <4.0 D was achieved or all interrupted sutures were removed in the steep meridian. Intact sutures were left in place indefinitely when an acceptable keratometric astigmatism was achieved. All sutures were removed after 12 to 18 months when high astigmatism could not be reduced by selective suture removal. There was no tension adjustment of any continuous sutures during the study period.

Results: The mean recipient age was 28.4±8.4 years at the time of keratoplasty, ranging from 15 to 52 years. The total number of selective removal of interrupted sutures was 233 with a mean of 2.0±1.1 (range, 1 to 6). The procedure was performed once in 48, twice in 41, three times in 18, four times in 8, five times in 1, and 6 times in 2 eyes, with 90.7% requiring 3 or less. Interval from keratoplasty to the first selective suture removal was 5.9±4.3 months (range, 1 to 22 months). Interrupted suture removal was initiated within 6 and 12 months postoperatively in 80 eyes (67.8%) and 107 eyes (90.7%), respectively. Interval from keratoplasty to the second, third, and fourth selective suture removal was 7.6±4.4 month (range, 2 to 27 months), 8.6±2.7 months (range, 4 to 18 months), and 10.3±4.6 months (range, 5 to 22 months), respectively. Complete suture removal was performed 8.6±7.6 months (range, 3 to 42 months) after the end of selective suture removal. Suture-in keratometric astigmatism was 6.3±2.0 D (range, 4.0 to 12.0) which was signficantly reduced to 3.91±2.23 D (range, 0.50 to 12 D) after the end of suture removal. Keratometric astigmatism was significantly increased to 5.45±2.93 D (0.50 to 14.0 D) after the completion of suture removal (P<0.001). The double-angled plots revealed that the centroid changed from 0.73 D @ 90° ± 6.58 D before suture removal to 0.66 D @ 99° ± 6.09 D after complete suture removal.

Conclusion: Selective suture removal can effectively decrease post-keratoplasty astigmatism. However, its effect lasts until the remaining sutures are left in place. Graft astigmatism increases unpredictably after complete sutures are removed.

Biography

Nasim Nouri As a member of the ophthalmology research community, the focus of our work has been on refining post-operative outcomes for keratoplasty patients, specifically targeting post-operative astigmatism in cases of keratoconus. Our research on the selective removal of sutures post-keratoplasty represents a significant advancement in the management of graft astigmatism, offering a nuanced approach to enhancing visual acuity and patient satisfaction. This technique, developed through rigorous analysis and patient follow-ups, not only showcases the potential for personalized post-operative care but also highlights the importance of precision in ophthalmic surgery. Our work not only paves the way for innovative treatment modalities but also underscores the critical role of meticulous post-operative management in the field of corneal transplantation.