COMPARISON OF SUTURED VERSUS SUTURELESS SCLERAL FIXATED INTRAOCULAR LENS AT A TERTIARY EYE HOSPITAL, NEPAL

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ABSTRACT

Background: One of the best options for correction of aphakia is scleral fixated intraocular lens. It can be implanted either using suture or without the use of suture. Each technique has its own pros and cons. The aim of this study was to compare the visual outcome and complications between the suture and sutureless technique of scleral fixation of intraocular lens.

Methods: It was a retrospective study done at a tertiary eye hospital in Koshi Province, Nepal where data of patients who underwent scleral fixated intraocular lens implantation from March 2017 to June 2017 were analyzed. Aphakic patients with absence of capsular support, subluxated lens (>180°) and patients with posteriorly dislocated IOL with minimum follow up of 6 months were included in the study. All the data were entered into the SPSS version 20, descriptive analysis was done and independent t-test was applied to test the statistical significance.

Results: Sixty-six eyes of 66 patients were included in the study. Out of which 51.5% underwent sutured and 48.5% underwent sutureless scleral fixated intraocular lens implantation. Male: female ratio was 1.6:1. Most common indication for scleral fixated intraocular lens was traumatic dislocation. Mean postoperative vision of sutured and sutureless SFIOL when compared, sutured SFIOL was found to have statistically significant improvement. Most common complication was corneal edema in both the groups.

Conclusions: Both techniques of scleral fixated intraocular lens showed satisfactory improvement in vision, but sutured SFIOL showed better vision postoperatively.

INTRODUCTION

The implantation of an intraocular lens (IOL) in the capsular bag after removal of the crystalline lens provides most stable fixation as it is closest to the nodal point of the eye. Various preoperative and intraoperative complications sometimes doesn’t allow the placement of intraocular lens in the bag. In these cases, aphakic glasses, contact lenses, anterior chamber intraocular lens, iris-fixated lens or scleral fixated intraocular lens are the choice of management. But these are associated with multiple ocular complications. The location of scleral fixated intraocular lens is nearest to the nodal point of lens, it is considered as the first choice of intraocular lens. Implantation of scleral fixated intraocular lenses can be done by two techniques, either using suture or without the use of suture. Sutured technique is often associated with suture related complications like suture erosion, intraocular lens tilt and endophthalmitis. Sutureless scleral fixated intraocular lens is also associated with multiple complications such as postoperative hypotony, corneal edema, vitreous haemorrhage, intraocular lens decentration.
Aphakic patients with absence of capsular support, subluxated lens (>180°) and posteriorly dislocated natural lens or intraocular lens with minimum follow up of 6 months were included in the study. Patients with hazy cornea, macular scar and those who had retinal break noted preoperatively and intraoperatively were excluded from the study. Three different surgeons (LA, LR, AM) with an equivalent expertise performed the operations. Intraocular lens used for sutureless three piece was Aurolens UV absorbing PC lens,6mm biconvex optic with modified C PMMA loops,2 manipulation holes,13.6 mm length 3 piece iol and one piece PMMA for sutured technique (EYE-O-CARE, premium quality intraocular lens, single piece PMMA lens ). Suture used was 10 - 0 polypropylene. Review of medical records were done and data recorded. Data included age, gender, axial length, refractive status, IOP measured by Goldmann applanation tonometry. Preoperative and postoperative best corrected visual acuity in six months follow-up. Details of surgery including primary SFIOL (in the 1st sitting) or secondary SFIOL (2nd sitting), type of scleral fixation intraocular lens and postoperative complications encountered were recorded. Any complications recorded within 1 month of surgery were recorded as early complication and those recorded after one month was recorded as late complications. The best corrected visual acuity was considered improved or deteriorated if the difference between the baseline that is preoperative and final at 6 months postoperative was ≥0.3 LogMAR. Intraocular lens tilt/decentration was defined as tilt or decentration at the pupillary axis when pupil was dilated.

All the data was recorded in excel and then transferred to SPSS version 20, frequency, mean and standard deviation was calculated for descriptive analysis. For analytical statistics independent t test was used to see postoperative visual acuity in both the techniques, p value ≤ 0.05 was considered to be statistically significant.

RESULTS

A total of 66 eyes of 66 patients met the inclusion criteria. Out of which 34 (51.5%)underwent sutured and 32 (48.5%)underwent sutureless scleral fixated intraocular lens implantation. Male: female ratio was 1.6:1. Mean age of the patients undergoing scleral fixated intraocular lens was 51.7 ±12.6 years. Mean postoperative vision of sutured and sutureless SFIOL when compared using t test, sutured SFIOL was found to have statistically significant (Table 1).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean postop vision (LogMar)</th>
<th>Sutured SFIOL</th>
<th>Sutureless SFIOL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sutured SFIOL</td>
<td>0.49</td>
<td>6(15.00%)</td>
<td>6(13.95%)</td>
</tr>
<tr>
<td>Sutureless SFIOL</td>
<td>0.71</td>
<td>2 (5%)</td>
<td>6(13.95%)</td>
</tr>
<tr>
<td>Raised IOP</td>
<td>3(7.5%)</td>
<td>3(7.5%)</td>
<td>1(2.32%)</td>
</tr>
<tr>
<td>Low IOP</td>
<td>0%</td>
<td>0%</td>
<td>5(11.62%)</td>
</tr>
<tr>
<td>Lens tilt /decentration</td>
<td>5(12.5%)</td>
<td>5(12.5%)</td>
<td>4(9.30%)</td>
</tr>
<tr>
<td>Epithelial defect</td>
<td>5(12.5%)</td>
<td>5(12.5%)</td>
<td>5(11.62%)</td>
</tr>
<tr>
<td>Vitreous haemorrhage</td>
<td>5(12.5%)</td>
<td>5(12.5%)</td>
<td>5(11.62%)</td>
</tr>
<tr>
<td>Retinal detachment</td>
<td>0</td>
<td>1(2.32%)</td>
<td>1</td>
</tr>
<tr>
<td>Cystoid macular edema</td>
<td>3(7.5%)</td>
<td>3(7.5%)</td>
<td>4(9.32%)</td>
</tr>
</tbody>
</table>

Table 2: Early and late postoperative complications of patients undergoing sutured and sutureless scleral fixated intraocular lens

<table>
<thead>
<tr>
<th>Early postoperative complications</th>
<th>Sutured SFIOL Number (%)</th>
<th>Sutureless SFIOL Number (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corneal edema</td>
<td>6(15.00%)</td>
<td>6(13.95%)</td>
</tr>
<tr>
<td>Hypotony</td>
<td>2 (5%)</td>
<td>6(13.95%)</td>
</tr>
<tr>
<td>Raised IOP</td>
<td>3(7.5%)</td>
<td>1(2.32%)</td>
</tr>
<tr>
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Table 2 shows corneal edema as the most common early postoperative complication in both the groups with addition of hypotony in sutured cases. Late postoperative complication in both the group was pigmentation over intraocular lens.

DISCUSSION

In this study sutured scleral fixated intraocular lens showed better visual outcome. Most common early postoperative complication in both the technique was corneal edema while the late complication was pigmentation over intraocular lens. Most of our patients were male, similar to study by Agrawal L et al.11 and Shrestha C et al.12 This shows the gender bias in seeking health care facility in our part of the world. Patient age in both groups were similar.
After any ocular surgery postoperative vision matters a lot. The mean postoperative corrected distant visual acuity (CDVA) after scleral fixated IOL has been reported in the range of 0.3–0.6 logMAR.13-17 In our study mean postoperative vision of sutured SFIOL was 0.49 and in sutureless 0.71 logMAR . In a study by Sindal et al both technique of sutured and sutureless SFIOL had equally good visual outcome in eyes with aphakia after cataract surgery and trauma while in our study sutured technique was found to be better.18

There are various complications reported in both the techniques. Most common complication in both the techniques in our study was transient corneal edema, which resolved itself within a week. It occurred in 15% sutured and 14% in sutureless SFIOL. In a study by Deb A et al.19

Transient corneal edema was 17% which was similar to our study. Previous studies have shown corneal edema to be around 10% after scleral fixated intraocular lens.20-22

Second most common early postoperative complication noted in the in sutureless scleral fixated intraocular lens was hypotony (15.6%) this was similar to study done at the same hospital by Agrawal L et al where hypotony in sutureless SFIOL was noted to be 19.4%.23 Possible reason might be as sclerotomy was made at 3 and 9 o'clock positions with 23G MVR needle and the haptics were exteriorized with the help of 23 G micro rhexis forceps, the tunnels created by these MVR needles were too large for the externalization of the haptics of the IOLs so, a mismatch between the diameters of the sclerotomy and haptic of the IOL resulted in wound leakage and also as the sclerotomy wound was not sutured which might have contributed to the postoperative hypotony.

Most common indication of scleral fixated intraocular lens in both the techniques was traumatic dislocation of lens or IOL which might be the reason for pigmentation over intraocular lens and was the most common late postoperative complication in both the techniques.

Similarly, the second most common late postoperative complication noted in sutured scleral fixated IOL was lens tilt and decentration, when examined under dilated pupil. Even though it was subjective and not measured with the help of UBM or anterior segment OCT. This might be due to the reason that in sutured scleral fixated group hepatic was fixated at 2 points, while in the sutureless scleral-fixated group, the hepatic was tucked into the scleral tunnel, therefore it was more stable for preventing movement of the hepatic along the transverse axis. The IOL tilt was reportedly greater with sutured scleral fixated intraocular lens in a study by Gabor et al.24 and Hayashi K et al25 where IOL tilt was observed more in sutured than in sutureless scleral fixated IOL.

The incidence of suture breakage in sutured scleral fixated intraocular lens in different studies range from 0.5 to 26.2% after mean of 6 years follow-up.22,25 The safety and stability of suture fixation were associated with several factors, including the suture type, technique of fixation and knot-tying technique.25,27 There was no case of suture breakage and IOL dislocation postoperatively in our study till the last follow up. The 10–0 polypropylene suture demonstrated long-term stability for SFIOL implantation for 24.75 years.25

Rhegmatogenous retinal detachment is one of the gravest complications noted after scleral fixated IOL surgery.28 In our study one case (1.5%) developed retinal detachment, who had history of closed globe trauma with posteriorly dislocated lens in the vitreous and had undergone pars plana vitrectomy with sutureless scleral fixated IOL. There was no detail in the record whether posterior vitreous detachment (PVD) was induced or not. Singh MS et al. reported a higher incidence of retinal breaks after PVD induction in eyes with ectopia lentis.29 So, when scleral fixated IOL was implanted in single sitting with vitrectomy after a history of trauma, detail fundus has to be examined both pre and postoperatively. The absence of a formed vitreous in post vitrectomized eyes might have predisposed them to early detachment.29 In a study by Kumar K et al the incidence of rhegmatogenous retinal detachment in eyes, which underwent scleral fixated intraocular lens surgery for subluxated lens was 1.4%, dislocated IOL 2.5%.28

In our experience certain conditions like patient with deep seated eyeball, performing surgery in the left eye especially sutureless was comparatively difficult as nasal bridge in these cases often cause difficulty in manipulation and insertion of haptic into the scleral tunnel. In case of sutured scleral fixated intraocular lens, it takes extra time to tie the knot, compared to the sutureless technique and there were high chances of suture breakage if tied too tightly. Sutureless technique even though fast, haptics needs to be held at the tip while taking out of sclerotomy and should not be bent. Similarly, it has to be inserted to the scleral tunnel without causing any bent at the haptic optic junction.

There are some limitations in our study. First, the retrospective nature with small sample size. Secondly, the follow-up was short; therefore, late complications such as suture degradation, hepatic exposure, or endothelial cell loss, which markedly increases after 6–12 months of follow-up were not identified, further studies are needed to generalize the findings.

CONCLUSION

Both techniques of scleral fixated intraocular lens showed satisfactory improvement in vision, but sutured SFIOL showed better vision postoperatively.

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CONFLICT OF INTEREST: None

FINANCIAL DISCLOSURE: None

REFERENCES:


