



Original article

Outcome of conjunctival autograft sutured with polyamide black sutures in pterygium surgery

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Abstract

Introduction: Pterygium excision with conjunctival autografting is the most effective way of treating pterygium with the least recurrence rate. The sutures which can be used to suture the conjunctival autograft are absorbable polyglactin 10-0 sutures or non-absorbable polyamide 10-0 sutures. The polyamide sutures are inert, elicit minimal acute inflammatory reaction, do not support infection and allow easy removal without tissue adherence. They are very cost-effective compared to polyglactin sutures. **Objective:** This study was aimed to assess the efficacy of the cost-effective polyamide sutures in terms of patient comfort, graft stability, need for suture removal and recurrence. **Materials and methods:** In this prospective, non-comparative study, 56 eyes of 56 patients with primary pterygium underwent pterygium excision with conjunctival autograft transplantation sutured with 10-0 polyamide black sutures. The patients' comfort, graft stability, need for suture removal and recurrence were assessed within a mean follow-up period of 28.75 months (range 7 - 14 months). **Results:** Mild discomfort was found in 14 (25 %) patients for up to 3 weeks, moderate discomfort in 8 (14.2 %) for up to 1 week, no patients had severe discomfort beyond the first day, and all patients were comfortable at the end of the sixth post-operative week. The graft was stable in all patients. Nine sutures in 5 patients out of 392 sutures in 56 patients, that is, 2.29 % of the sutures, needed to be removed at the end of the sixth post-operative week. Two patients, or 3.57 %, had a recurrence. **Conclusion:** In pterygium surgery, suturing the conjunctival autograft with cost-effective polyamide black sutures is efficient and safe.

Key-words: pterygium surgery, conjunctival autograft, polyamide sutures

Introduction

Pterygium is a chronic degenerative condition, characterized by a triangular fibrovascular growth of bulbar conjunctiva encroaching on to the cornea, located horizontally in the inter-palpebral fissure. Though pterygium is a worldwide condition

it is more common in tropical and sub-tropical countries. It is more prevalent in 'pterygium belt' between the latitudes 30° north and 30° south of equator (Mahmoud et al, 2007). The prevalence rate of primary pterygium varies from 0.7% to 31% in various populations around the world (Srinivasan et al, 2009).

Etiology is thought to be due to chronic irritation of conjunctiva from the elements like wind, dust and sun (UV radiation).

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The region of this study, mainly being a rural and agricultural dominant locality with sugar factories, has the population of this region exposed to wind, dust and UV-radiation. So the incidence and prevalence of pterygium is high. It causes a significant amount of morbidity as a result of constant itching, pricking, diminution of vision and cosmetic blemish.

It has frustrated both patient and the surgeon alike, with its tendency to recur. Simple excision carries a high recurrence rate ranging from 24% to 89% (Mahmoud et al, 2007). Thus an effective and economical means of management of this disease is a necessity. Pterygium excision with conjunctival autograft is the most effective way of treating pterygium with least rate of recurrence. This procedure reduces the rate of recurrence to 0% - 10% (Al Favez, 2002 ; Gris et al, 2000 ; Rao et al, 1998).

The sutures which can be used to suture the conjunctival autograft are absorbable polyglactin (vicryl) 10-0 sutures or non-absorbable polyamide (nylon) 10-0 sutures.

The non-absorbable polyamide 10-0 sutures are very inert, elicit minimal acute inflammatory reaction, do not support infection and allows easy removal with no tissue adherence. They are very cost effective compared to polyglactin sutures.

So we used the non-absorbable polyamide 10-0 suture for suturing the conjunctival autograft and assessed the outcome in terms of patient comfort, graft stability, need for suture removal and recurrence.

Materials and methods

A prospective study between February 2007 to December 2009 was done on a continuous cohort of 56 patients with primary pterygium who presented to the out-patient department of our hospital. These patients underwent primary pterygium excision with conjunctival autograft suturing using 10-0 polyamide sutures.

The study protocol and informed consent procedure were approved by the institutional

review board through the ethical committee. The informed consent was obtained from all patients. The study was done in accordance with declaration of Helsinki.

All patients were examined in detail with slit lamp, retinoscopy, funduscopy, tonometry, etc, blood investigations like Hb% and RBS were done. Blood pressure was also examined. All the data was collected in a case sheet proforma.

Inclusion criteria were all primary pterygium between age group of 20-70 yrs. Exclusion criteria were recurrent pterygium, previous ocular surgeries, cataract surgeries, the patients with history of ocular diseases predisposing to ulceration or poor wound healing like dry eye syndrome, rheumatoid arthritis and herpetic keratitis were excluded from the study.

Indications for pterygium surgery were corneal encroachment > 2 mm, repeated inflammation, causing visual disturbances, cosmetic disfigurement. The surgical procedure was performed by a single surgeon. Pre-operatively the patients were treated with topical antibiotic drops four times/day from 1 day prior to surgery.

The procedure was carried out under peribulbar block with 2% lignocaine and 0.5% bupivacaine using an operating microscope. Under aseptic conditions a wire speculum was inserted. A crescent blade was used to excise the pterygium head from the cornea, and the body of pterygium along with underlying tenons was excised using Westcott scissors. A no.15 bard parker blade was used to smooth the corneal bed. Haemostasis of the sclera bed was achieved with a wet field cautery. The abnormal corneal epithelium and superficial fibrous scar tissue were stripped off by blunt dissection.

The conjunctival defect was measured with a caliper, and a conjunctival autograft measuring the same size as the conjunctival defect was obtained from the superotemporal quadrant of the bulbar conjunctiva of the same eye. Conjunctival scissors and conjunctival forceps



were used to harvest the free conjunctival autograft. Meticulous dissection was performed to remove most of the tenons tissue in the autograft. The graft was moved over to the area of the conjunctival defect, with care taken to maintain the limbus to limbus and stromal side down orientation. The autograft was secured with seven interrupted 10-0 polyamide sutures to the episcleral bed. All knots remained unburied. The donor site was left open for spontaneous healing.

At the end of the procedure an antibiotic-steriod combinational eye ointment was inserted into the conjunctival sac and patch was applied. The pad and patch was removed the next day and the patients were advised to use a pair of dark glasses.

Post-operative medications were ofloxacin-dexamethasone 8 times/day tapered over a period of 6 weeks, Ketoralac 6 times/day tapered over 6 weeks, Lacrigel eye ointment 4 times/day for 6 weeks. Sutures were not removed till 6 weeks. If patients complained of pricking sensation lacrigel ointment was prescribed. All subjects were reviewed at one day, one week, three weeks, 6 weeks, three months, six months and there after they were followed up at every six monthly interval for 14–47 months.

During each post-operative visit visual acuity assessment, slit lamp biomicroscopy, and intra-ocular pressure measurement were done. During each post-operative visits all patients were evaluated for patient discomfort like pain, photophobia, lacrimation, foreign body sensation, graft stability, need for suture removal, recurrence and any other complication resulting from surgery.

Patient's discomfort was graded as mild, moderate and severe (according to a visual analogue scale - VAS) a 10 cm numeric VAS was used to score the discomfort, with one end labeled 'no discomfort' and the other labeled 'worst possible pain' (Victoria et al, 2007). It was graded as mild, moderate and severe as in table 1.

Table 1: Grading of patient discomfort

| Grade of patient discomfort | Scoring on a numeric VAS Scale |
|-----------------------------|--------------------------------|
| Mild | 1-3 |
| Moderate | 4-6 |
| severe | 7-10 |

Graft stability was graded as in table-2 (Srinivasan et al, 2009).

Table 2: Grading of graft stability

| Grades | Graft stability |
|---------|---|
| Grade-0 | All four sides of the graft margin are well apposed. |
| Grade-1 | Gaping/displacement of one side of graft-bed junction. |
| Grade-2 | Gaping/displacement of two sides of graft-bed junction. |
| Grade-3 | Gaping/displacement of three sides of graft-bed junction. |
| Grade-4 | Graft completely displaced from the bed. |

At the end of 6 weeks the number of sutures remaining were noted. Recurrence was looked for in each visit. Recurrence was defined as fibrovascular tissue crossing the corneo-scleral limbus onto clear cornea in the area of previous pterygium excision. Parameters for assessment were expressed in percentage.

Results

This case study consisted of 56 eyes of 56 patients with primary pterygium. The demographic details and clinical details are summarized in table-3.

Table 3: Demographic and clinical details of patients

| | |
|---------------------|---------------|
| Mean age (years) | 43.25 |
| Age range (years) | 20-85 |
| Sex | |
| Males | 21 |
| Females | 35 |
| Laterality | |
| Right | 23 |
| Left | 33 |
| Follow-up (months) | 28.75 (47-14) |

Post-operatively the patients' discomfort was analyzed in every follow up visit (Table-4). Mild discomfort was found in 14 (25%) patients for



up to 3 weeks, moderate discomfort was found in 8(14.2%) for up to 1week, no patients had severe discomfort beyond 1 day and all patients were comfortable at the end of 6weeks post-operative.

Table 4: Result of patient discomfort

| Grades | Post operative period | | |
|-------------------------------------|-----------------------|----------------------|----------------------|
| | 1 st Week | 3 rd Week | 6 th Week |
| Mild | 14 (25%) | 14 (25%) | - |
| Moderate | 08 (14.2%) | - | - |
| Severe | - | - | - |
| Total no. of patients- 56 patients. | | | |

The graft stability was studied and it was found that the graft was stable in all patients in all follow-up visits.

At the end of 6 weeks the number of sutures needed to be removed was noted. It was as in (Table 5).

Out of 392 sutures (ie, 56 patients x 7 sutures = 392) 9 sutures needed to be removed. That is 2.29% of the sutures needed to be removed at the end of 6 weeks.

Table 5: Number of sutures removed at the end of 6 weeks

| No. Sutures needed to be removed at the end of 6 weeks | No. of patients | Total no. of sutures removed in each patient |
|--|-----------------|--|
| 1 suture | 2 | 2 |
| 2 Sutures | 2 | 4 |
| 3 Sutures | 1 | 3 |
| Total no. of sutures removed at the end of 6 weeks among 56 patients | | 9 |

Recurrence of pterygium was noted in 2 patients. So the recurrence rate in this study was 3.57%. In one patient it recurred at 3rd month follow up and in the other patient at 6th week follow up.

No intra-operative complications occurred. Post-operatively there were no cases of infection, significant inflammation, epithelial problems and reduction in visual acuity.

Discussion

This study was done to assess the safety and efficacy of cost-effective polyamide sutures.

The area where this study was done is mainly a rural and agricultural dominant locality with sugar factories, and has the population of this region exposed to wind, dust and UV-radiation. So the incidence and prevalence of pterygium are very high (Corneo , 1993 ; Coster , 1995 ; Wong, 1978). Thus an effective and economical means of management of pterygium is a necessity.

Pterygium excision with conjunctival autografting

is the most effective way of treating pterygium with least rate of recurrence (Alpay et al, 2009; Kenyon et al, 1985 ; Vastine et al, 1982 ; Prabhasawat et al,1997 ; MacKenzie et al,1991 ; Rubinfeld et al, 1992).

The sutures which can be used to suture the conjunctival autograft are absorbable polyglactin 10-0 sutures or non-absorbable polyamide 10-0 sutures (Victoria et al, 2007).

We used non-absorbable polyamide 10-0 sutures to secure the conjunctival autograft as it is cost-effective as compared to polyglactin sutures and assessed its outcome. Polyamide sutures do have many advantages (Bainbridge et al, 1998 ; Linberg et al, 1991; Raina et al, 1999 ; Salthouse et al,1977).

1. Being a monofilament it has no interstices to support bacterial growth, so do not support infection.
2. Being monofilament gives excellent knot security.
3. Maintains tensile strength indefinitely in tissues.



4. It is inert like stainless steel and elicit minimal acute inflammatory reaction.
5. The uniform and smooth surface allows easy tissue penetration with minimal trauma, so well tolerated.
6. Easy removal with no tissue adherence.

The main concern about using the polyamide suture is it may cause patient discomfort and it may need removal.

In this study patient discomfort was assessed using a 10 cm numeric Visual analogue scale. No patients had severe discomfort beyond 1 day, 14.2% of patients had moderate discomfort upto 1 week, 25% of patients had mild discomfort upto 3 weeks. All patients were comfortable at the end of 6 week postoperative follow-up. So the patient discomfort was not very intolerable.

In this study the sutures were not removed till 6 weeks. Each case was sutured with 7 sutures (7 x 56). Out of the 392 sutures only 9 sutures needed to be removed. That is 2.29% of total sutures needed to be removed at the end of 6 weeks. Those who had sutures complained of moderate discomfort upto 1 week and mild discomfort upto 3 weeks, later all were comfortable. The discomfort was treated with increased frequency of application of lacrigel eye ointment.

Victoria et al (2007) compared the use of polyglactin and polyamide sutures and concluded that both are effective suture materials for autograft suturing in pterygium surgery and cause comparable post operative discomfort. Polyglactin sutures resulted in slightly more conjunctival reaction in early postoperative period compared to polyamide sutures, but at 4 weeks post-operative follow-up significantly more polyamide sutures remained on autograft.

The graft stability was good in all cases at all follow-ups.

Our study reported recurrence rate of 3.57% which is similar to the study by Alpay et al (2009)

and Soliman et al (2009). They reported the recurrence of 4.75%. This is similar to results of Rao et al (1998) who reported recurrence of 3.8%. The literature says that with this procedure the recurrence rate is 0% to 10% (Al Fayed ,2002; Gris et al, 2000 ; Rao et al, 1998).

No major complication, intra-operatively or post operatively, was seen in our study.

Conclusion

In pterygium surgery suturing the conjunctival autograft with the cost-effective polyamide black sutures is efficient and safe.

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