

Comparative Study of Pterygium Excision with Conjunctival Autograft Using Autologous Blood and Sutures in a teaching hospital

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INTRODUCTION

Pterygium, a word derived from Greek “pterygos” meaning wing. Pterygium is defined as a degenerative ocular surface disorder with wing-shaped fibrovascular growth of the conjunctival tissue encroaching on the cornea. ^[1] Pterygium is a disease of tropical areas and it has worldwide prevalence. The incidence is high in geographic areas with high ultraviolet radiation, hot, dry, windy, dusty and smoky environments. The prevalence rate of primary pterygium varies between 0.3% – 29% in various populations around the world. ^[2]

Surgical removal of pterygium is the treatment of choice. Earlier, the surgical management of pterygium was, simple excision of pterygium with bare sclera technique i.e. leaving a wide area of bare sclera. However, recurrence of the pterygium was unacceptably high, in as many as 89% of cases. To improve surgical results, two strategies have been adopted: the destructive approach, which enhances the effect of excision of pterygium by radiation (beta-irradiation) and chemotherapy (mitomycin C, thiotepa, 5 -fluorouracil) and the reconstructive approach, namely transplantation of various tissue grafts (conjunctival autograft, amniotic membrane transplantation, mucous membrane graft, conjunctival limbal transplantation). Recurrences after conjunctival autograft vary from 0% to 39%. ^[3] In 1985, Kenyon et al. proposed that to prevent recurrence, a conjunctival autograft of the bare sclera could be used in primary and recurrent pterygium. ^[4] Since then, pterygium excision with conjunctival

autografting has become the standard in the management of both primary and recurrent pterygium. It gives good results with respect to recurrence, complication rates and cosmesis.^[1] The surgical methods to fix the conjunctival autograft to the sclera after excision of pterygium are using sutures or fibrin glue. Each method has its own advantages and disadvantages. Fixing the graft with sutures has disadvantages like increased operating time, postoperative discomfort, inflammation, buttonholes, giant papillary conjunctivitis, scarring, and granuloma formation.^[5] Fibrin glue which is used nowadays to fix the conjunctival autograft has many advantages like easy fixation of the graft, shorter surgical time, reduction in complications and postoperative discomfort. The disadvantages are high cost, the risk of transmission of infections and its non-availability to all the surgeons. Fixing the conjunctival autograft with autologous blood is a new technique which is also known as suture-and glue-free autologous graft fixation. Autologous blood is natural, has no extra cost or associated risks, and can overcome the postoperative irritations to a great extent.^[1]

In our present study we compared 2 groups of patients one using sutures and the other group using autologous blood for fixation of graft as it had many advantages and no major disadvantages.

MATERIALS AND METHODS

A comparative study was conducted in our hospital after obtaining approval from the institutional ethical committee and informed consent was taken from the patients. 50 adult patients with primary progressive pterygium, requiring pterygium surgery with conjunctival autograft were selected in this study. 25 patients underwent primary pterygium excision with conjunctival autograft using autologous blood (no glue, no suture group) i.e. group 1 and 25 patients with 8-0 vicryl suture (suture group) i.e. group 2. Patients with recurrent pterygium, double head pterygium, ocular surface pathology, ocular surface infections, bleeding abnormalities, and patients on anticoagulant therapy were excluded from the study. Thorough history taking was done in all the cases. After ocular examination, the grade and type of pterygium was noted. Every alternate patient of progressive pterygium was assigned to one group receiving autologous blood (group 1) and the other group receiving sutures (group 2).

Surgical procedure was performed in all cases by single surgeon. Surgery time was noted from insertion of the lid speculum till the lid speculum was removed. Eye to be operated was painted and draped. Lid speculum was applied. The pterygium was dissected properly to expose the sclera and corneal stroma. The subconjunctival fibrovascular tissue, including Tenon's capsule, were removed thoroughly to provide clean scleral bed and the tissue over the cornea was dissected using crescent blade. Hemostasis was allowed to occur spontaneously. Cautery was not used as some amount of oozing helps the graft to adhere to the scleral bed. Around 0.5 mm more than the defect was marked on supero-temporal aspect of bulbar conjunctiva involving the limbus. A thin conjunctival autograft free of tenons tissue with limbal stem cell was excised. The graft was flipped over on the bare sclera taking care that proper orientation was maintained, with the epithelium side up and the limbal edge toward the limbus.

In group 1, after the graft was positioned, the graft is gently stretched (spread) with mild pressure on the scleral bed, so that the graft is firmly attached. The graft gets attached to the bed due to coagulation of fibrin from the little oozing of blood under the flap. The tissue was left in place for about 8-10 mins. In suture group patients, the graft with the epithelial side up was placed on bare sclera and was secured with 3-4 sutures using 10-0 monofilament nylon. All the suture knots were buried underneath.

The speculum was removed carefully without disturbing or displacing the graft. The lids are closed, and bandage was applied for 24 h. Postoperatively, steroid antibiotic combination drops and tear substitutes were initially given 4 times a day and tapered over 4 weeks.

Patients were asked to come for follow up on the 1st day, 7th day and then on 1st, 3rd and 6th months following surgery. Complaints such as pain, watering, foreign body sensation and burning of the operated eye were graded on the 1st day and 7th day. The complaints of the patients were graded as follows:

- a) Grade 0: No complaints
- b) Grade 1: mild, complaints which are easily tolerable
- c) Grade 2: moderate, complaints and discomfort not affecting the daily activities and sleep
- d) Grade 3: severe, complaints and discomfort influencing daily activities and sleep

Postoperative complications like what graft edema, graft retraction and recurrence were recorded.

Statistical data analysis was done using SPSS software 19.0. Chi-square test was done for proportions in qualitative data and Student's unpaired t-test for quantitative data. $p < 0.05$ was considered statistically significant

RESULTS:

A total of 50 patients with primary progressive pterygium underwent pterygium excision with conjunctival autograft out of which 25 patients underwent primary pterygium excision and conjunctival autografting with autologous serum (Group 1 : no glue, no suture group) and 25 patients with 10-0 monofilament nylon (Group 2 : suture group).

The mean age of the patients was 44.2 ± 7.34 years in group 1 and 43.8 ± 7.12 years in group 2. There was no statistical significant difference of age between group 1 and group 2 ($P > 0.05$) as shown in Table no 1.

In our study males predominated than females in both Group 1 and group 2 as in Table 2. There was no statistical significant difference of gender between group 1 and group 2 ($P > 0.05$)

The mean operative time was 15.7 ± 4.51 mins in group 1 and 24.7 ± 5.32 mins in group 2.

There was statistically highly significant difference of operative time between group 1 and group 2 ($P < 0.01$) as shown in Table no 3.

In our study maximum number of patients in group 1 had no complaints as compared to group 2 patients showing that the patients were more comfortable with surgery with autologous blood as compared to the sutures. There was statistically highly significant difference of grades of post-operative complications between group 1 and group 2 ($P < 0.01$) as shown in Table no 4.

In our study graft edema and mild graft retraction was seen in few patients in group 1 which was not seen after 1 week with treatment. Recurrence was not noted in any of the patients in both the groups as in Table no 5. There was no statistical significant difference of complications between group 1 and group 2 ($P < 0.01$)

Discussion:

Pterygium is very common in India, which is part of 'Pterygium Belt' as described by Cameron. ^[6] The limbal stem cell damage by ultraviolet light causes conjunctivalization of the cornea which is currently accepted etiology of this condition. ^[5]

We conducted the study to show that excision with conjunctival autograft using autologous blood could not only reduce the rate of recurrence but also made the surgeon and patient comfortable with easy availability and less cost. A simple surgical procedure that could reduce the recurrence rate and had minimal complications and without the use of costly consumables was planned.

Demographic status:

Pterygium was common in males and in the age group of 41-50 years in both the groups as in other studies. In study by Rekha B K et al the maximum incidence of pterygium was in the age group of 30 -39 years, ^[5] and in study by Shaaban A M et al the mean age was 49 ± 12 years. ^[7]

Mean operative time:

In our study the mean operative time was 10-19 mins in the autologous blood group (group 1) and 20-29 mins in the suture group (group 2). Similar results were in the mean operative time in the autologous blood group was $24 (\pm 5.64)$ min and $28.64 (\pm 6.45)$ min in the suture group in a study by Shaaban A M et al was found. ^[7] Sucharita Das et al used freshly prepared autologous fibrin glue and showed that the mean operating time was found to be significantly shorter 17.8 ± 1.07 in glue group compared to suture group. ^[8] Jagdish Bhatia et al concluded that the surgical time was also significantly shorter in no glue, no suture technique (35 min) as compared with the sutured technique (45–50 min). ^[9] In a study by Rekha BK et al the mean operative time was 22.1 ± 5.43 min in autologous blood group and 25.2 ± 2.61 min in suture group. ^[5]

Post operative patient comfort:

In our study maximum number of patients in autologous blood group were comfortable postoperatively with no to minimal complaints of pain, watering, foreign body sensation, while maximum number of patients in the suture group had complaints which disturbed their day to day activities and sleep.

Suchitra Das et al in their study found that postoperative patient discomfort was significantly lower in glue group, ^[8] Jagdish Bhatia et al said that from the patients' perspective, greater comfort allows a more rapid return to their normal lifestyle and productivity. ^[9] Rekha BK et al found that all the patients in the autologous blood group reported less discomfort than in suture group. ^[5]

Post operative complications:

Graft edema and graft retraction were seen in very few cases in both the groups which reduced in one week postoperatively. No recurrence was found in both the groups as there was immediate adherence of the graft to the scleral bed and lack of postoperative inflammation as no foreign material was used to fix the graft in group 1 which was the need of the surgery. Wit et al reported no graft displacement and postulated that sutureless and glue free graft resulted in even tension across the whole graft interface and no direct tension on the free edges resulting in reduced stimulus for sub-conjunctival scar formation. ^[10] Shaaban A M et al noted that graft dehiscence occurred in 8% in the suture less and glue free conjunctival autograft (group 1), graft retraction in 12% in group 1 versus 6% in suture group (group 2) and pyogenic granuloma in 3% in group 2. ^[7] Rekha B K et al did not encounter any serious intraoperative or postoperative complications. Recurrence was not observed in both the groups throughout the follow-up period. ^[5] Jagdish Bhatia et al showed that nasal gaping was seen in 36% of cases (74 cases), which healed spontaneously without any surgical intervention. Recurrence rate in their study was higher (6.8%). ^[9]

Conclusion:

To conclude, Pterygium excision with conjunctival autograft using autologous blood is an innovative technique in pterygium surgery. It not only shortens the duration of surgery but also from the patients' perspective, it is cost effective, gives greater comfort and lesser post-operative complications as compared to using sutures.

Conflict of interest: None

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