



SUTURELESS, GLUE-FREE CONJUNCTIVAL-LIMBAL AUTOGRAFT IN THE MANAGEMENT OF PRIMARY PTERYGIUM

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ABSTRACT

Background: Pterygium is a triangular wing shaped fibrovascular growth of subconjunctival tissue on to the cornea. Surgical removal is the treatment of choice but no single technique is successful due to high recurrence rate.

Aim: To evaluate the success and complications of sutureless glue-free conjunctival-limbal autografting in management of primary pterygium.

Materials and Methods: A prospective interventional study was carried out in 60 patients to analyse the outcome of sutureless and glue-free conjunctival-limbal autograft for the management of primary nasal pterygium. The patients were followed up after 1 week, 3 weeks, 6 weeks and at 3 months postoperatively. The mean age of the patients was 38.28 ± 13.77 years (range 21-67), 55% of which were females. Graft retraction occurred in 3(5%) eyes. Haemorrhage was seen in 20(33.33%) eyes at 24 hours, which persisted in only 8(13.33%) eyes at 3 weeks and resolved completely in 100% of eyes at 6 weeks. Oedema was noted in 5(8.33%) eyes at 24 hours, and resolved completely by 1 week. Recurrence of pterygium was observed in 2(3.33%) eyes at three months of follow-up.

Conclusion: Sutureless and glue-free conjunctival-limbal autograft following pterygium excision is an easy, quick, safe, effective, and economical option for the management of primary pterygium.

KEYWORDS : Autologous conjunctival graft, Conjunctival degeneration, Fibrin glue, Limbal stem cells.

INTRODUCTION

Pterygium is a degenerative, triangular wedge-shaped growth of conjunctival tissue, located usually on nasal side, but temporal location can also be there. It proliferates as a vascularized granulomatous tissue to invade the corneal surface. It can cause irritation, mild heaviness or recurrent redness in the eye, in addition to the obvious cosmetic concerns. It also decreases vision in the eye by either causing astigmatism, or directly encroaching the pupillary axis, or by causing corneal opacity [1]. It is influenced by age and solar radiation [2].

Surgical excision is the treatment of choice but it has a high rate of recurrence ranging from 24% to 89% [3]. Numerous adjunctive measures have been described after pterygium excision to reduce the recurrence rates. These include mitomycin-C application, beta-irradiation, conjunctival autograft and use of amniotic membrane [4,5,6].

Limbal-conjunctival autograft is currently the most popular surgical procedure [7]. It has been suggested that including the limbal stem cells in the graft act as a barrier which prevents migration of conjunctival cells onto the corneal surface. The most common method of autograft fixation is suturing, which has drawbacks of prolonged operating time, postoperative discomfort, suture abscess, buttonholes, and granuloma formation which usually requires a second operation for removal. Replacing sutures with tissue adhesive may shorten the operation time, improve postoperative comfort, and avoid suture related complications. But the disadvantages of these plasma-derived fibrin glue are the cost, the potential risk of transmitted infection, anaphylaxis in susceptible individuals, and inactivation by iodine preparation [7-12].

Sutureless and glue-free conjunctival autograft is a new, easy, fast, safe, economical and effective technique for the management of pterygium [7,13]. In view of problems associated with the suturing and the trend towards increasing use of sutureless and glue-free grafting, this study has been undertaken to evaluate the safety and effectiveness of sutureless and glue free conjunctival-limbal autograft in the management of primary pterygium.

Material and Methods

60 eyes of 60 patients suffering from primary nasal pterygium were enrolled in the present study. The study was conducted over a period of one year after due clearance from the Ethics Committee. Inclusion Criteria were patients of all ages and of either sex presenting with primary nasal pterygium. Exclusion Criteria were a) recurrent pterygium b) patients suffering from glaucoma or retinal pathology requiring surgical intervention c) history of previous ocular surgery or

trauma, and d) ocular surface diseases interfering with graft viability. A detailed medical and ophthalmic history with special reference to first appearance of the condition, its progression and previous surgery were noted. Uncorrected and best corrected visual acuity was recorded. Slit lamp examination was performed for documentation of pterygium size and morphology. Ophthalmoscopy and measurement of intraocular pressure was done in all cases. All patients were explained about the procedure, and an informed written consent was taken.

Topical instillation of antibiotic with anti-inflammatory eye drops four times a day was prescribed 1-day before surgery. Peribulbar anesthesia was given with 50:50 mixture of 5ml of 2% Lignocaine and 0.5% Bupivacaine. A universal eye speculum was placed and the body of the pterygium was dissected down to the bare sclera, 4 mm from the limbus. The fibrovascular tissue was dissected from the surrounding conjunctiva with spring scissor and head was removed from the cornea by avulsion [Figure-1]. Only the thickened portion of conjunctiva and the underlying Tenon's capsule showing tortuous vasculature was excised. Haemostasis was allowed to occur spontaneously without the use of cautery. Large bleed should be tamponade before placing the graft as it can lift the graft from the sclera bed with subsequent complications. However, small bleed in the sclera bed leads to a small ooze of serum which acts as an adhesive for the graft.

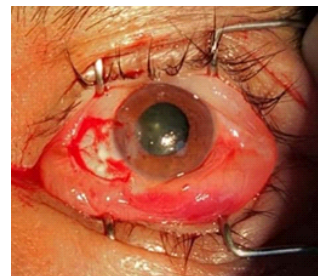


Figure-1: Excision of pterygium down to bare sclera

The size of the defect was measured with the calipers. A conjunctival-limbal graft, about 1mm oversized, was fashioned from the superior bulbar conjunctiva [Figure-2]. The graft was placed on the bare sclera and placed in such a way so as to maintain the limbus-limbus orientation [Figure-3&4]. The free graft was held in position for 8-10 minutes by application of gentle pressure over it with a lens spatula. The scleral bed was viewed through the conjunctiva to ensure that residual bleeding does not lift the graft. The eye was patched for 24 hours. Oral NSAIDs were administered for 5 days to control pain along with systemic antibiotics.

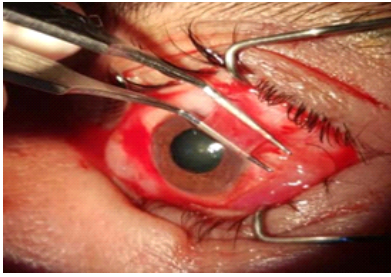


Figure-2: Preparation of conjunctival-limbal autograft

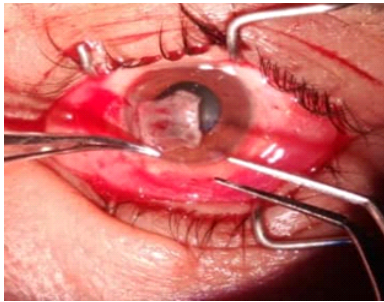


Figure-3: Alignment of graft before placing on the scleral bed



Figure-4: Graft placed on the scleral bed

The patch was removed after 24 hour and the patient was advised not to rub the eye. Topical antibiotic-steroid eye drops were administered 4 times a day for 2 weeks and then tapered over the next 4 weeks. The patients were followed up post-operatively after 1 week, 3 weeks, 6 weeks and at 3 months. At each visit visual acuity, slit lamp examination, and Tonometry were done to assess for complications and pterygium recurrence. Recurrence was defined as postoperative re-growth of fibro vascular tissue extending greater than 1mm over the corneal surface.

Results

A total of 60 eyes of 60 patients were studied. The demographic profile of the patients is summarized in Table-1.

Table-1: Patients Demographic Data

Age groups (Years)	No. of Patients		
	Males (%)	Females (%)	Total (%)
21-30	11(18.33)	08(13.33)	19(31.67)
31-40	07 (10.33)	11(18.33)	18(30)
41-50	05 (8.33)	10(16.67)	15(25)
51-60	02 (3.33)	03(5)	05(8.33)
61-70	02(3.33)	01(1.67)	3(5)
Total (%)	27(45)	33(55)	60(100)

Of the 60 patients, 27 (45%) were males and 33 (55%) were females. The mean age of the study population was 38.28±13.77 years (range, 21-67 years). The pterygium was present in 32(53.33%) right eyes and 28(46.67%) left eyes. 49 (81.67%) eyes had best corrected visual acuity (BCVA) of 6/6 to 6/12 on Snellen's vision drum, 9 (15%) eyes had 6/18 to 6/36, whereas 2(3.33%) eyes had advanced pterygium with BCVA of <6/60. No significant intraoperative complications were noted except for button-holing of the conjunctival flap in 3 eyes (5%). Graft retraction occurred in 3 eyes (5%) and recurrence was seen in 2 eyes (3.33%) after 3 months of follow up. In eyes with graft retraction, no active treatment was instituted and the exposed area epithelialized

adequately on follow up without compromising surgical or cosmetic results. Haemorrhage was seen in 20(33.33%) eyes at 24 hours, which persisted in only 8(13.33%) eyes at 3 weeks and resolved completely in 100% of eyes at 6 weeks. Oedema was also noted in 5(8.33%) eyes, persisted only in 1(1.67%) eye at 3rd day and resolved completely by 1 week [Table-2].

Table-2: Post-operative complications

Post-operative Follow-up	Complications				
	Symptoms (%)	Haemorrhage (%)	Retraction (%)	Oedema (%)	Recurrence (%)
24 hours	15(25)	20(33.33)	03(5)	05(8.33)	0
1 week	06(10)	16(26.67)	01(1.67)	0	0
3 weeks	02(3.33)	08(13.33)	0	0	0
6 weeks	0	0	0	0	0
12 weeks	0	0	0	0	02(3.33)

The donor site re-epithelialized completely within ten days after surgery; its epithelial healing was not associated with shrinkage or malformation in any of the eyes. At 6 weeks postoperatively, 3(5%) eyes showed gain in BCVA by one line whereas one (1.67%) eye by two lines on Snellen's vision drum. No other major complications were noted.

Except for 2 eyes which develop recurrences, all other eyes had good postoperative cosmesis [Figure-4].



Figure-4: conjunctival-limbal autograft at 1 month after surgery

DISCUSSION

Recurrence of pterygium is a well-established fact. Recurrence usually occurs within 6 months after surgery but can occur after 6 months to 3 years and this tends to be more aggressive than the original lesion [14-16]. Recurrence rates as high as 24-89% has been reported [3]. Hence, the aim of surgery should not only be pterygium excision but to prevent its recurrence also.

Although many surgical techniques have been proposed to remove pterygium, still there is no single operation which is an ideal one. Adjunctive treatment (beta-irradiation, mitomycin-C, thiotepa etc.) was introduced to reduce the rate of recurrence but even these may also be associated with complications [14,17]. Autologous conjunctival-limbal grafting is currently the most popular surgical procedure for pterygium removal. It forms a barrier at the limbus and hence lowers the recurrence rate. It is either attached with sutures, or with biological adhesive like fibrin glue, or with autologous fibrin. But Suturing of the autograft is difficult, requires technical skills and also increases the surgical time [18]. Suzuki et al also reported that silk or nylon suture being foreign bodies, incites inflammation and Langerhan's cell migration into the cornea [19]. In addition, sutures may cause patient discomfort, suture abscess, buttonholes, dellen formation, granuloma formation, or graft rupture [20,21]. Other alternative to secure the graft is to use biological tissue glue. Advantages of tissue glue are easy to fix the graft, decreased operation time, and reduction in complications. But its use is also associated with certain disadvantages like cost, risk of transmission of infections and also being fibrinogen compound is susceptible to inactivation by iodine preparations used for sterilization before surgery. Recently many studies have shown successful outcome with sutureless and glue-free conjunctival-limbal autograft [22-25].

In the present study, the mean surgical time was 22.6 minutes including 10 minutes of waiting time for graft to adhere on the bare sclera. Other studies also show similar average operation time. Xu et al reported

20.4 minutes, Mansour 15 minutes, Sharma et al 23.20 minutes where as Elwan reported 24 minutes of average operating time [21,22,24,25]. So our average surgical time was comparable to these studies.

No significant intraoperative complications were seen except for button-holing of the conjunctival flap which was seen in 3(5%) eyes. Similarly, 3.75% of button-holing was reported by Sharma et al in a series of 80 patients [23].

Postoperative symptoms like pain, watering and redness were seen in 15 (25%) patients. The symptoms were maximum on day-1 and then gradually disappeared within 3 weeks. Elwan concluded that postoperative symptoms like pain, foreign body sensation, photophobia, hyperaemia and chemosis were significantly lower in the first postoperative month [21]. Also overall patient satisfaction was significantly higher in sutureless compared to sutured autograft, Where as Kim et al reported that symptoms disappeared in 64% of patients in one week and all the patients were symptom free within two weeks of surgery [20,21]. Postoperative symptoms were also reported more with sutured as compared to sutureless autograft by various authors [7,13,26-28].

Complications like Graft oedema was seen in 5(8.33%) patients after 24 hours. A similar study by Elwan showed conjunctival oedema in 16% of patients, whereas, Sharma et al reported graft oedema in 8% of patients after 24 hours of surgery [21,24]. Graft retraction in our study was seen in 3(5%) eyes on day one and in 1(1.67%) patient after one week. Similar incidence of graft retraction was reported by other authors [7,22,23,29]. Haemorrhage was seen in 20(33.33%) patients on day one of surgery which completely disappeared 6 weeks after surgery without compromising the results of the graft. Similar incidence was observed by Sharma et al who reported haemorrhage in 32.5% of eyes at 24 hrs which persisted in 7.5% eyes at three weeks and resolved completely in 100% of the eyes at 6 weeks [23]. The donor graft site re-epithelialized completely within ten days after surgery without any associated shrinkage or malformation of conjunctiva in any eye.

In our study, recurrence was seen in 2(3.67%) patients after a follow-up period of 3 months. Elwan reported a recurrence rate of 6% of patients with limbal conjunctival autograft after a follow up of 2 years, whereas, Malik et al reported recurrence in 1 eye (2.5%) at 6 months [7,21]. Similarly Hall et al observed no recurrence at the end of 3 months in the glue group whereas Foroutan et al reported a recurrence of 13.33% in three years with autologous fibrin [29,30]. Wit et al also observed no recurrence in 15 eyes after a mean follow up of 9.2 months [13]. Similar results were shown by other authors [7,22].

In present study at 6 weeks postoperatively, 3(5%) eyes showed gain in BCVA by one line whereas one (1.67%) eye by two lines on Snellen's vision drum. Sharma et al reported an improvement in BCVA of one line in 3.75% of patients and three lines in 1.25% of patients at 6 weeks postoperatively [23].

The higher success rate after conjunctival-limbal autograft is due to the fact that the graft attaches itself to the globe and acts as a barrier against the recurrence. Furthermore, apposition of the lids to the bulbar conjunctiva acts as a natural biological dressing which provides a unique wound healing environment. This technique results in an even tension across the graft interface with no direct tension on the free edges resulting in decreased stimulus for the formation of granulation tissue. A thin graft with meticulous dissection from the Tenon's capsule is a prerequisite for a successful graft take up.

The current study has some limitations. It is not a comparative study with the conventional techniques, the number of eyes is relatively less, and also no attempt has been made to study the correlation of outcome with the epidemiological and socio-demographic factors.

CONCLUSION

Suture less and glue free conjunctival-limbal autograft is a recent technique for the treatment of pterygium. It not only decreases the operative time but also reduces the rate of complications associated with suturing. Moreover easy feasibility, cost factor, absence of tedious suturing process and lack of potential complications associated with use of foreign materials such as glue or sutures make it superior to other techniques. Thus, sutureless and glue-free conjunctival-limbal autograft following pterygium excision is an easy, quick, safe,

effective, and economical option for the management of primary pterygium.

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