



Sutureless and glue-free technique of conjunctival autograft in primary pterygium surgery: A series of 52 eyes

Nitesh Narayen^{1*} and Sridhar MS²

¹Winvision Eye Hospital, Hyderabad, Telangana, India

²Department of Ophthalmology, Krishna Institute of Medical Sciences, Minister Road, Hyderabad, Telangana, India

Abstract

Purpose: To study the efficacy and complications of sutureless and glue free conjunctival autograft for the management of primary pterygium over a period of one year.

Methods: This is a retrospective case series and patients who were operated between November 2012 and June 2014 were analysed. 52 eyes of 50 patients were included in the study. Pterygium excision with limbal conjunctival autografting without using glue or sutures was performed in all the patients followed by bandaging for 12 hours. The patients were followed up post operatively on 1st day, 1st week, 6 weeks, 6 months and 12 months. They were examined for haemorrhage, wound gape, graft shrinkage, chemosis, graft dehiscence, recurrence or any other complication.

Results: The mean age of the patients was 48.7 +/- 13.6 years (range 19–77 years). 2 eyes had double-headed pterygium, 2 had cystic pterygium and the remaining had primary nasal pterygium. Total graft dehiscence occurred in 1 eye (1.92%), partial graft retraction in 2 eyes (3.84%), graft edema in 3 eyes (5.76%) and recurrence was seen in 1 eye (1.92%) on one side in a patient who had double-headed pterygium. No other complication was noted.

Conclusion: Sutureless and glue free limbal conjunctival autografting following pterygium excision is a safe, effective and economical option for the management of primary pterygium.

Keywords: glue-free technique; conjunctival autograft; pterygium surgery

***Corresponding author:** Dr. Nitesh Narayen, 6-3-868/2, Begumpet, Greenlands, Hyderabad -500016, Telangana, India. Tel.: 040-44855577; Email: drniteshnarayan@gmail.com

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Introduction

Pterygium is a common disorder in many parts of the world with reported prevalence rates ranging from 0.3–29% [1]. It is wing shaped conjunctival encroachment generally situated on the nasal side but at times both nasal and temporal and rarely it can be seen only on the temporal side [2]. Pterygium is most frequent in areas with more ultra violet radiation [3]. Hot, dry windy dusty and smoky environments also seem to play a role. Hereditary factors have been postulated as a possible cause for pterygium [4]. The exact cause for pterygium still remains unclear.

Over the years various treatment strategies such as a simple excision with or without adjunct measures (post-operative B irradiation, intraoperative and post-operative mitomycin) and various older techniques of conjunctival grafting have been tried to decrease recurrence after surgery [3]. Kenyon et al. in 1985 proposed that a conjunctival autograft of the bare sclera could be used in the treatment of recurrent and advanced pterygium [5]. While doing conjunctival auto graft initially sutures were used with associated complications of infection, granuloma formation and chronic inflammation [6]. Fibrin glue has been used in place of sutures while doing conjunctival autograft with reported advantage of less pain, shorter operating time, and less pterygium recurrence [1, 7]. Postulated etiology of reduced recurrence includes immediate adherence of the graft and lack of post-operative inflammation which inhibits fibroblast ingrowth. Bahar et al. reported greater patient acceptance with the use of fibrin glue compared to sutures in addition to shorter operating time [8]. Major concerns of use of fibrin glue include the cost and also the risk of transmitted infection. The cost of glue can be overcome by scheduling multiple pterygium surgeries on a single day. Potential risk of complications like transmission of viral infection with the use of bio adhesive have been found in patients undergoing thoracic surgery but similar cases have not been reported following pterygium surgery. The other rare complication of use of plasma derived products includes hyper sensitivity reaction.

D De Wit et al., in 2010 reported the simple method of achieving conjunctival autograft adherence during pterygium surgery without the use of fibrin glue or sutures [6]. This study involved 15 eyes of 12 patients. After pterygium excision and fashioning of conjunctival autograft the recipient bed is encouraged to achieve natural haemostasis and relative desiccation before graft placement. Excessive haemorrhage in the bed was tamponaded. Graft adherence and positioning was examined 20 minutes after surgery. The mean follow up time was 9.2 months. Cosmesis was excellent in all cases. There was no intra operative or post-operative complication requiring further treatment.

The experiences of above technique in a series of 52 eyes of 50 patients with an average follow up of 13.7 months (range 7–20 months) are described.

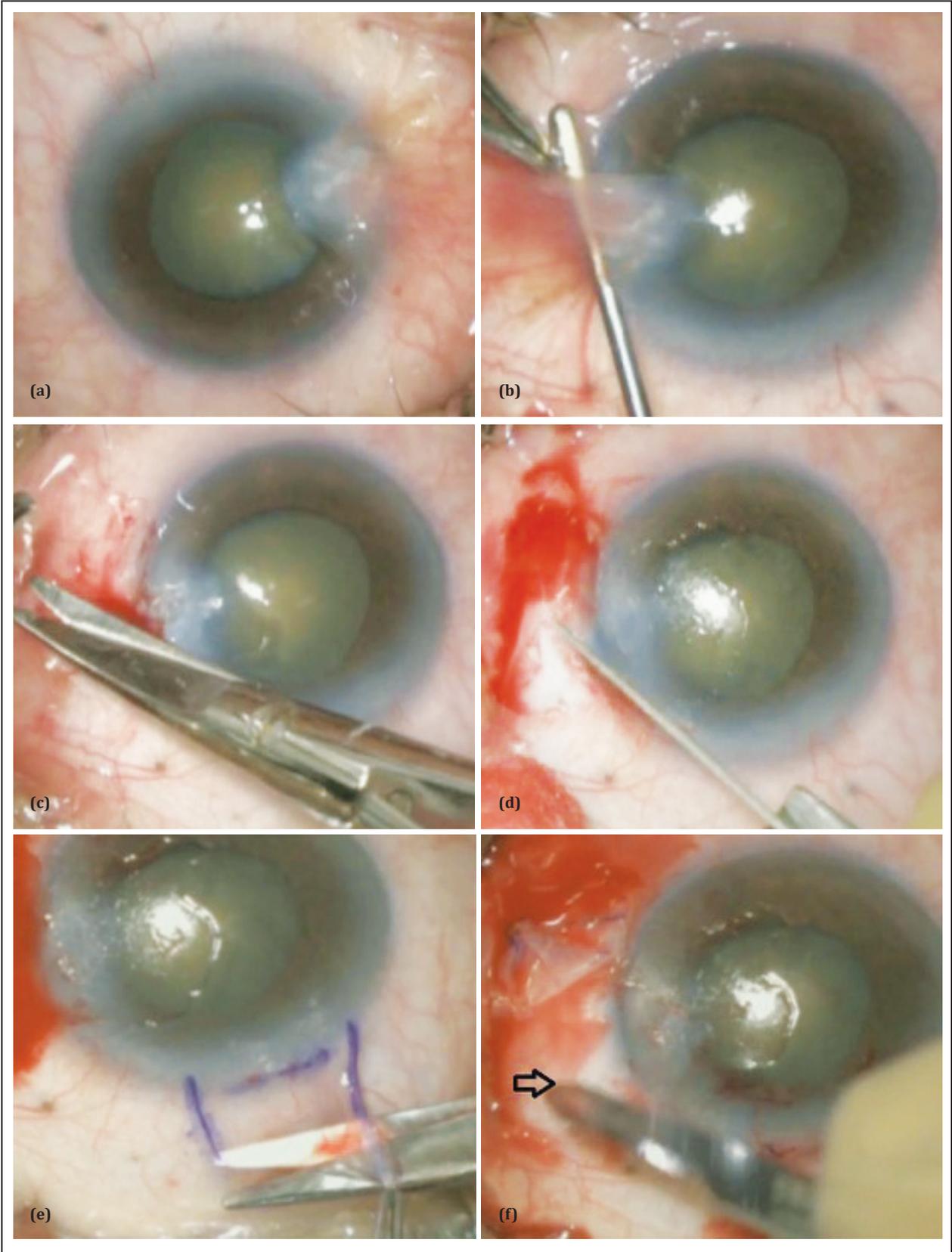
Materials and methods

Retrospective chart review of all consecutive patients of primary pterygium who had undergone sutureless and glue free conjunctival autograft performed between November 2012 and June 2014 in the cornea service of Maxivision eye hospital was done. All these patients were operated by a single surgeon. All cases were operated under peribulbar anaesthesia. The blunt spatula was used to dissect the plane at the neck of the pterygium and with a sweeping fashion it was peeled off from the cornea. The pterygium along with its body is then dissected down to the bare sclera avoiding the insertion of the medial rectus and extensive dissection of tenons followed by careful 15 number blade dissection of conjunctival remnants on the cornea. The size of the defect is then measured with Castroviejo Calipers (Bausch & Lomb Storz, Storz instruments, St Louis, MO, USA). Careful dissection is then done between the donor graft conjunctiva and tenon's layer to get a thin graft which is 1 mm oversized from the superior conjunctival limbal area. The orientation of the limbal area is maintained of the donor graft while covering the recipient area. Fresh bleeding is then initiated by fracturing small veins and capillaries to induce bleeding to provide autologous fibrin between the graft and the recipient bed. The stabilisation of the graft is tested with a forceps on all the sides after haemostasis is achieved which usually takes 5-7 min. None of the patients were on anti-coagulating agents pre operatively which usually cause lot of bleeding and delayed haemostasis as well. All these patients were examined after half an hour to see if the graft is in place. Then patch was again applied after instilling 0.3% Moxifloxacin eye drops (Vigamox, Alcon, USA). The patch was removed the next day. On post-operative day 1, the position of the graft and presence of epithelial defect on the cornea were noted. Post operatively patient was continued on 0.3% Moxifloxacin eye drops 6 times a day for 1 week along with 1% Prednisolone eye drops (Prednisolone, Alcon, USA) in a tapering dosage over 1 month and artificial tears as needed. All these patients were followed up on post op day 1 after surgery, day 4-5 till the epithelium heals, every week for the next 2 weeks, every month for the next 3 months and then every 3 months till the last follow-up.

Patients were examined post operatively for haemorrhage, wound gape, graft shrinkage, chemosis,

graft dehiscence, and recurrence. Recurrence was defined as any growth across the limbus onto the

cornea. The pre-operative, surgical steps and post-operative images of a patient is shown in Figure 1.



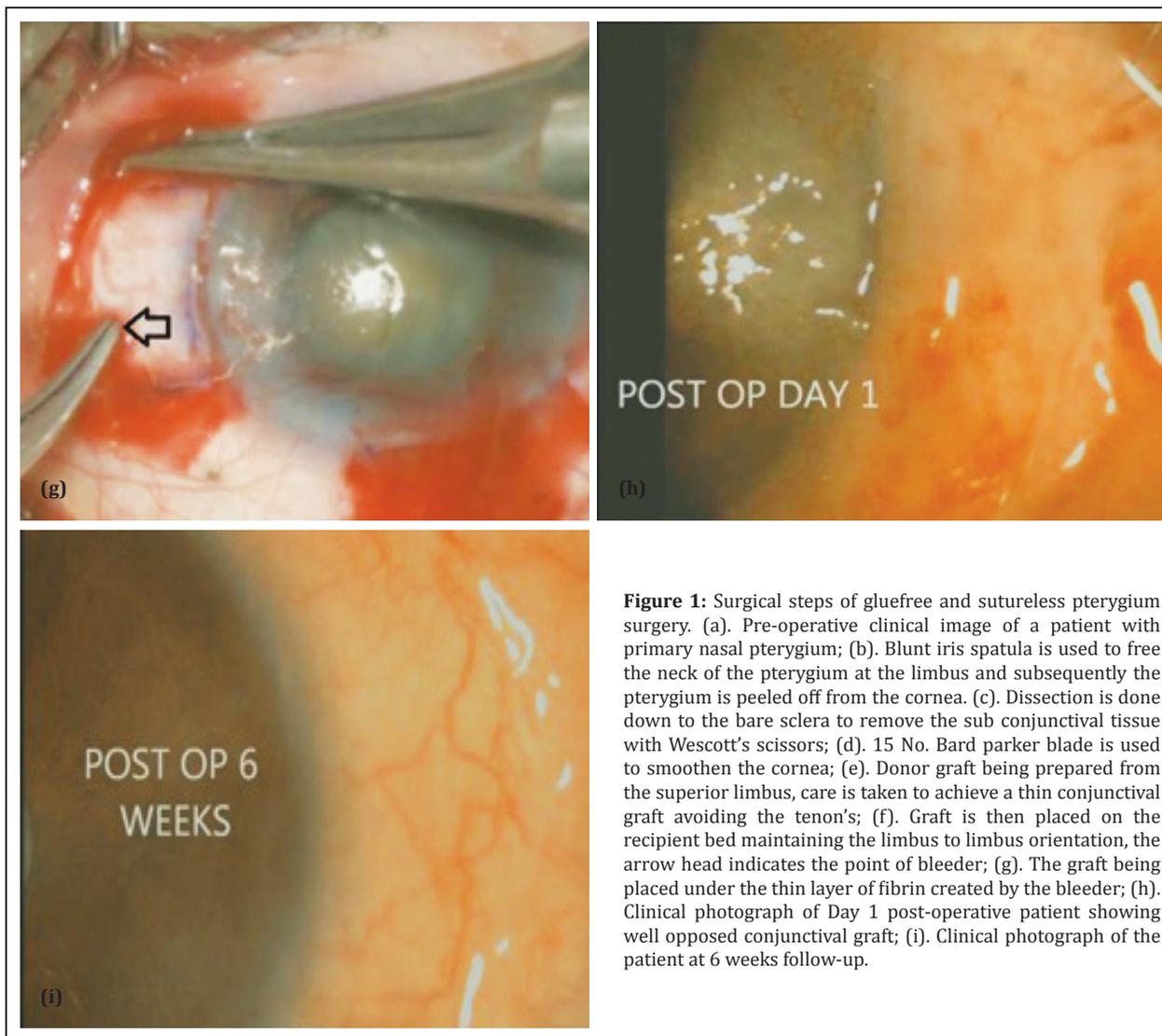


Figure 1: Surgical steps of gluefree and sutureless pterygium surgery. (a). Pre-operative clinical image of a patient with primary nasal pterygium; (b). Blunt iris spatula is used to free the neck of the pterygium at the limbus and subsequently the pterygium is peeled off from the cornea. (c). Dissection is done down to the bare sclera to remove the sub conjunctival tissue with Wescott's scissors; (d). 15 No. Bard parker blade is used to smoothen the cornea; (e). Donor graft being prepared from the superior limbus, care is taken to achieve a thin conjunctival graft avoiding the tenon's; (f). Graft is then placed on the recipient bed maintaining the limbus to limbus orientation, the arrow head indicates the point of bleeder; (g). The graft being placed under the thin layer of fibrin created by the bleeder; (h). Clinical photograph of Day 1 post-operative patient showing well opposed conjunctival graft; (i). Clinical photograph of the patient at 6 weeks follow-up.

Results

The study involved 52 eyes of 50 patients (26 Males and 24 Females). The mean age of the patient was 48.7 +/- 13.6 years (range 19–77 years). 48 patients had unilateral pterygium and 2 had both nasal and temporal pterygia. Table 1 showing the relative distribution of nasal primary pterygium, nasal and temporal pterygia and cystic pterygium is shown in Table 1. The post-operative complications seen in this series is shown in Table 2.

Post operatively graft dislodgement was seen in 1 eye (1.92%). This patient was managed by suturing the graft with 8-0 vicryl sutures. Partial graft retraction was seen in 2 eyes (3.84%, Figure 2) and overriding of the graft onto the cornea was seen in 1 eye (1.92%, Figure 3). Both had no consequence and

Table 1: Showing the relative distribution of primary nasal pterygium, Double-headed pterygium and cystic pterygium.

Primary nasal pterygium	46
Double-headed pterygium	2
Cystic pterygium	2

Table 2: The post-operative complications.

Complication	No. of eyes (%)
Total graft dehiscence	1 (1.92%)
Partial graft retraction	2 (3.84%)
Over-riding of the graft onto the cornea	1 (1.92%)
Partial recurrence in double-headed pterygium	1 (1.92%)
Graft edema	3 (5.76%)

the surface healed well with regular post-operative medications. Graft edema was seen in 3 eyes (5.76 %, Figure 4) which was managed by stepping up the frequency of steroid drops. None of these eyes led to the recurrence of pterygium. Recurrence was seen only in 1 eye (1.92%, Figure 5). This was a patient of both nasal and temporal pterygia. Recurrence was noticed during the 2nd month follow-up. The recurrence remained stationary after extending to about 1.5 mm on the cornea. The visual acuity of this patient was 20/20 with the refraction of 0.50 × 90 at 17 months of follow-up.

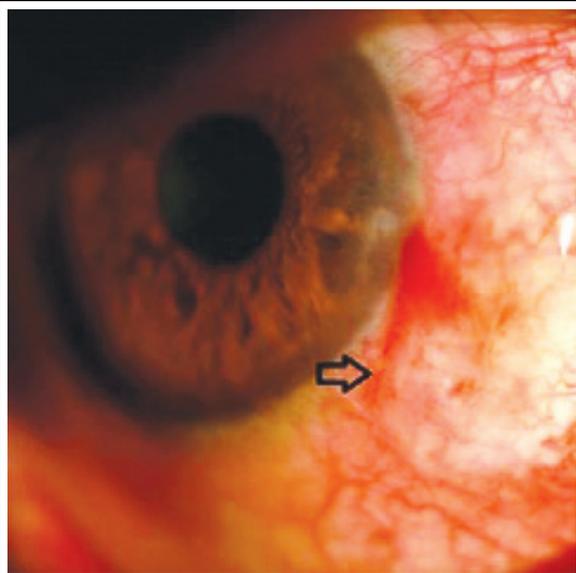


Figure 2: Diffuse slit lamp view showing graft retraction inferiorly.

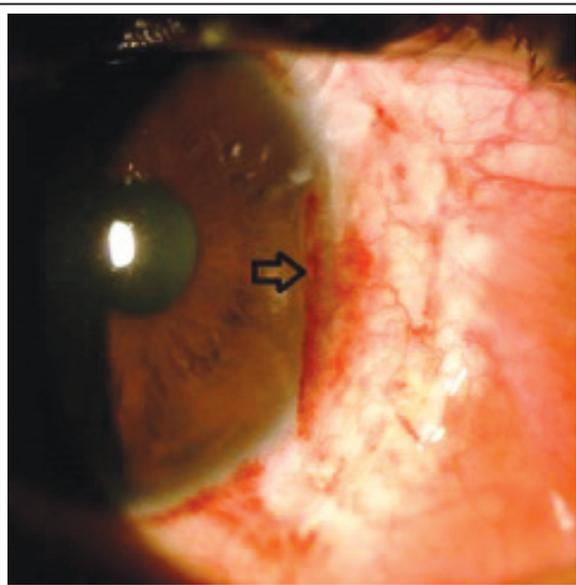


Figure 3: Diffuse slit lamp view showing overriding of the graft onto the cornea to the extent of 1mm.

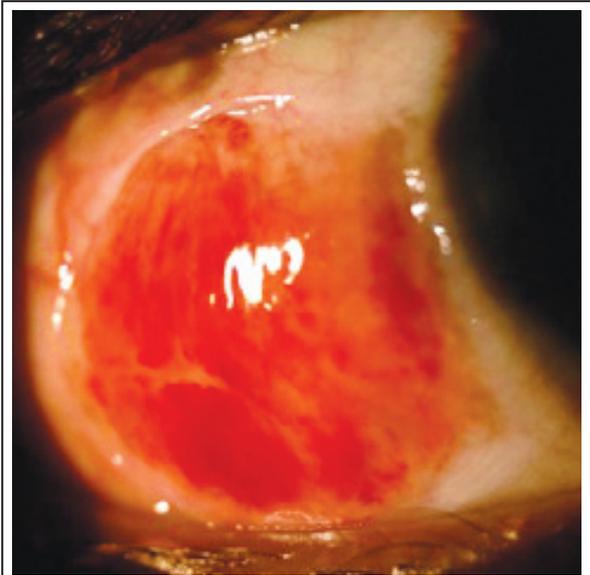


Figure 4: Diffuse slit lamp view showing graft edema which resolved with topical steroids.

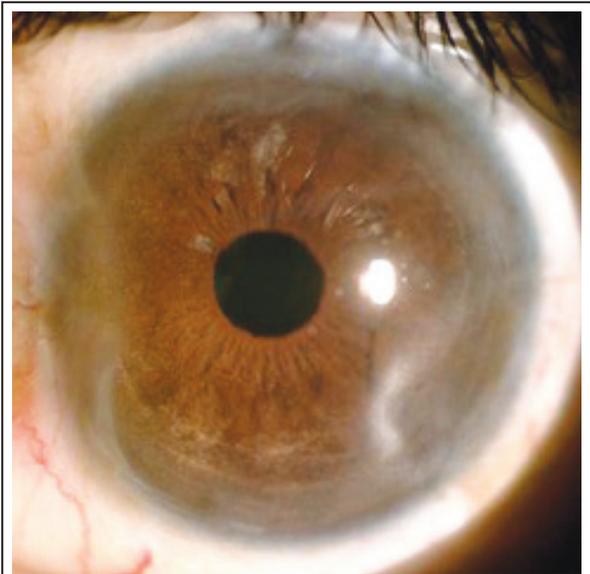


Figure 5: Slit lamp view showing partial recurrence temporally with a case with double-headed pterygium.

Discussion

Operative complications related to pterygium surgery are uncommon and generally related to the surgical technique. This includes excessive bleeding, button hole of the graft, and rare injury to the medial rectus. Early post-operative complications include persistent epithelial defect, pyogenic granuloma and dellen formation. Of greater concern is potentially serious sight threatening complications that have been associated with the use of mitomycin C and beta irradiations such as scleral necrosis [9], infectious

scleritis [10, 11], serious secondary glaucoma [12], iritis, cataract, corneal edema [13], corneal perforation [14, 15] and endophthalmitis [16]. The main post-operative complication is recurrence.

Fibrin glue has been used as an alternative to sutures for securing conjunctival grafts [2, 7, 16, 17]. The use of fibrin glue shortens operating time significantly and is associated with less post-operative discomfort. It is claimed that the use of fibrin glue also provides a more even attachment of the graft to the scleral bed. Minimal inflammation and sporadic cases of graft dislodgement or loss are noted. Koranyi et al. 2005 demonstrated recurrence rate of 5.3% with glue versus 13.5% with sutures [7].

The idea of suture less and glue free conjunctival autograft in pterygium surgery is promising and also safe with no glue related complications like hypersensitivity reactions and possible risk of viral transmission. In the series of D vitet et al., no intra-operative or post-operative complications were seen in 15 eyes [6]. The mean graft area was 24 mm² and the mean follow-up time was 9.2 months. The primary outcome measures in this series were graft dislocation and pterygium recurrence. Secondary outcome measures included size of the graft used, patient comfort on visual analogue scale and visual acuity. In this series there were no transplant dislocations or failures. The visual acuity was not affected in majority of the patients. Post-operative pain on Day 1 after surgery was consistently rated as less than or equal to 2 out of 10 on a visual analogue score. Pain did not increase after the first post-operative day. Patients rated their cosmesis as excellent in all cases. The authors concluded that the operating time, post-operative symptoms, recurrence and complication rate of sutureless and

glue free conjunctival autograft appeared to be equivalent to conventional suture and glue technique of a similar follow up duration. The risk of graft retraction appears to be no greater without suturing as long as meticulous dissection of sub epithelial graft tissue was respected. The authors opined that in this small series surgical time appeared no greater than published literature though the possibility of longer operation time compared to sutures or fibrin glue is possible.

The similar technique of sutureless and glue free limbal conjunctival autograft for pterygium surgery was reported by Malik KP et al., in 2012 [18]. This was a prospective case series of 40 consecutive eyes with primary nasal pterygium. Total graft dehiscence occurred in 2 eyes (5%), graft retraction in 3 eyes (7.5%) and recurrence was seen in 1 eye (2.5%).

In this series we report 52 eyes of 50 patients; the same technique reported by De Vitet al. and Malik KP et al., was adopted. This is the largest series of sutureless and conjunctival autograft reported in literature. All these patients had a minimum follow up of 7 months. No serious intraoperative or post-operative complications were seen. Graft dislodgement was seen only in one eye which was managed by suturing. Partial graft retraction, overriding of the graft on to the cornea and graft edema were minor complications seen but had no consequence as all these 3 resolved with regular post-operative medications. Recurrence was seen only in one eye around two months after surgery; this was a patient of both nasal and temporal pterygia. Recurrence required no further management as it remained stationary after extending 1.5mm onto the cornea with no significant astigmatism and had good unaided visual acuity. Table 3 summarises

Table 3: Results of published literature on use of glue, sutureless and glue-free technique.

<i>Studies</i>	<i>Technique</i>	<i>No of eyes</i>	<i>Male/ Female</i>	<i>Follow-up</i>	<i>Operating time</i>	<i>Complications</i>
Ayala M 2008 [3]	Glue	88	67: 21	1 year	11.8 +/- min	Recurrence – 4.54%, Conjunctival granuloma – 1.18%
Koranyi G et al., 2004 [2]	Glue	20	13:7	6 months	9.7 min	Recurrence - 8%
D De Wit et al., 2010 [6]	Sutureless Glue-free	15	4:8	9.2 +/- 2 months	14 +/- 1.4 min	---
Malik KP et al., 2012 [18]	Sutureless Glue-free	40	30:10	1 year	N. A	Total graft dehiscence – 5%, Graft retraction – 7.5%, Recurrence – 2.5%
Our study	Sutureless Glue-free	52	26:24	13.7 months	N. A	Graft dislodgement – 1.92%, Graft retraction – 3.84%, Over- riding of the graft – 1.92%, Recurrence – 1.92%

the results of published literature on use of glue, sutureless and glue-free technique in comparison with the present series.

Conclusion

To conclude the results were excellent after sutureless and glue free conjunctival autograft in pterygium surgery in a series of 52 eyes of 50 patients. Prospective randomised comparative study involving patients with pterygium using sutures, fibrin glue and sutureless, glue-free technique with conjunctival autograft will provide more evidence regarding the efficacy of the technique presented.

Conflicts of interest

The authors declare no conflicts of interest

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