

**Evaluate the efficacy of conjunctival autograft
with autologous plasma in surgical management of primary pterygium**

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Introduction

Since the days of Susruta, the world's first ophthalmic surgeon, pterygia have been recognized as a triangular sheet of fibro-vascular tissue that appears on the bulbar conjunctiva & cornea, disturbing both the patient because of their appearance and the surgeon because of their tendency to recur. Pterygium are characterized by excessive fibro-vascular proliferation on the exposed ocular surface and are thought to be caused by increased light exposure, dryness, dust, heat, and wind (Rosenthal JW et al, 1953).

In the exposed population, the growth of pterygium has been seen in younger teenagers and widely prevalent in people in deserts. Pterygia are seen nearly twice often in men as in women (Cameron ME et al, 1965). Symptoms include chronic ocular surface inflammation and tearing, eventually astigmatism and blurred vision attributable to optical axis involvement. Successful management of pterygium is a constant challenge for ophthalmologists due to high recurrence rate (2.1 % to 87 %, Bardley PG et al, 1998) and sight threatening complications of different surgical techniques (Gupta VP et al, 1997).

The recent concept of the role of the corneal Limbal stem cells has lead to the development of the new concept of pathogenesis of pterygia. Accordingly, pterygium is a local limbal deficiency. Pterygium recurrence can be reduced if the limbus and limited area of the cornea are

included in the conjunctival graft, as it is well recognized that limbal stem cells play a vitalrole in maintaining the ocular surface.

The function of limbal stem cells which are situated in the basal layers of the conjunctival epithelium, include regeneration of the tissue and cell replacement (Khamar Betal, 2000). Thoft introduced the concept of the ocular surface and idea of its reconstruction.

This study comprised of the use of Conjunctival autograft transplantation to the pterygia. Conjunctival auto transplant taken from the actinically unexposed conjunctiva prevents re proliferation of actinically altered cells into the cornea (Thoft RA et al, 1977). Suture is, an old, basic method to sew wound, also used to stitch the conjunctival autograft. It has some disadvantage in ophthalmic use such as irritation, infection, inflammation, and allergy.

Autologous fibrin glue has been used as an alternative method for graft fixation by some authors (Cohen & Donald, 1993; Foroutan et al, 2011). A recent cross-sectional study also describes successful outcome with sutureless and glue-free conjunctival autograft (Wit et al, 2010).

The present prospective study was then undertaken to evaluate the efficacy of sutureless and glueless conjunctival autograft with autologous plasma in cases of pterygium surgery.

Materials and methods

This prospective interventional case series included consecutive 43 eyes with primary nasal pterygium requiring surgical excision.

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The primary outcome measures included graft dislocation and pterygium recurrence. Graft success was defined as an intact graft by the end of 6 weeks after operation without need for sutures. Recurrence was defined as any growth of conjunctiva exceeding 1mm onto the cornea.

Exclusion criteria included recurrent pterygium, conjunctival scar, tumour, corneal tumour, bullous keratopathy, dry eye, pseudopterygium, glaucoma, retinal pathology requiring surgical intervention, history of previous ocular surgery or trauma.

Surgical technique

The pterygium head was held by lims forcep and was then excised from the corneal surface with the help of a crescent knife or beaver 11 no. blade. Only the thickened portions of the conjunctiva, the immediate adjacent and subjacent tenon capsule showing tortuous vasculature were excised and sharp dissection by Westcott scissors (Geuder, Germany) was done for separating the fibrovascular tissue from the surrounding conjunctiva. Care was taken to avoid conjunctival plica excision and extensive dissection of the tenon. Spontaneous haemostasis was allowed to occur without the use of cautery. The size of defect was measured in mm² with castroviejo callipers. Dissection between donor graft conjunctiva and tenon layer was done carefully while fashioning the 2.0 mm oversized conjunctival limbal graft from the superior bulbar conjunctiva. Average graft size was 14 to 16 mm². The autologous conjunctival graft taken from superior bulbar conjunctiva was scraped from the under surface and a thin layer of graft was prepared. Autologous plasma was extracted pre-operatively from the patient's 3ml heparinized blood and centrifuged for 10 minutes to separate the

blood cells and plasma. This autologous plasma was used after the preparation of the graft to wet the bare sclera and the graft. The graft was then carefully positioned on the host's bare sclera and care was taken to coincide the limbal portion of the graft to the limbal portion of the bare sclera. A gentle pressure was applied on the graft for 10 minutes. Antibiotic eye ointment, steroid eye ointment and lubricating eye ointment were applied in the patient's eye and the eye was patched for 48 hours.

Postoperative regimen

After removal of the patch, the patient was advised not to rub the eye and topical Loteprednol eye drops were administered four times a day which was tapered over 6 weeks. Chloramphenicol eye drops were instilled four times a day for 2 weeks along with lubricating eye drops.

The patients were followed up post operatively on day 2, 1 week, 6 weeks, 26 weeks. Refraction was performed at 6 weeks. The patients were examined for haemorrhage, wound gape, graft shrinkage, chemosis, graft dehiscence, recurrence or any other complication.

Results

The mean age of the patients was 42.8 years (range 23-61), 75% were males. All the patients were followed up for one year after surgery and there were no drop outs.

Total graft retraction occurred on the conjunctival side in 2 eyes (4.65%). In one patient, it developed following injury with a finger on the 4th postoperative day. In the other, there was lack of adhesion due to accidental inclusion of Tenon's in the free limbal conjunctival graft. The removal of Tenon's also caused delayed healing of the donor site. The graft appeared thickened and congested on the 3rd postoperative day and

the retraction was noticed on the 7th day. Both the patients were managed by securing the same graft using 9-0 vicryl suture. There was mild chemosis in all these patients. All the two patients were managed conservatively by bandaging for 48 hours.

The chemosis disappeared by the end of 7th postoperative day. At 6 weeks postoperatively, the gain in uncorrected visual acuity (UCVA) ranged from 0.18 to 0.5 logMAR in 31 (72.1%) eyes. There was no change in UCVA in rest of the patients. The BCVA showed no change following surgery.

Recurrence was seen in 1 eye (2.3%) at 6 months. None of the patients developed button hole, excessive bleeding, injury to medial rectus, dellen, pyogenic granuloma, symblepharon formation or scleral necrosis.

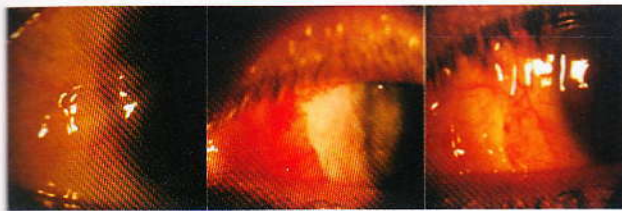


Fig 1: Pre-op photo Fig 2: 1st Post-op day Fig 3: same eye after 12 weeks.

Discussion

Recurrence after a successful excision continues to remain a challenge in pterygium surgery. Various adjunctive therapies like radiotherapy, antimetabolite or antineoplastic drugs, conjunctival flap, amniotic membrane, lamellar keratoplasty, conjunctival and limbal conjunctival grafts have been proposed to prevent recurrence.

Generally, the pterygium recurrences occur during the first 6 months after surgery (Adamis et al., 1990). The limbal conjunctival autograft has a recurrence rate ranging from 0-15% (Du et al., 2002; Al-Fayez, 2002). Koranyi et al (2004) demonstrated a recurrence rate of 5.3% with glue versus 13.5% with sutures and suggested that

immediate adherence of the graft and lack of postoperative inflammation may inhibit fibroblast ingrowth and reduce the recurrence.

Foroutan et al (2011) prepared autologous fibrin glue and used tranexamic acid as an antifibrinolytic agent to tide over the problem of disease transmission and anaphylaxis, respectively. Fibrinogen compounds may be susceptible to inactivation by iodine preparations such as those used for conjunctival disinfection before pterygium surgery (Wit et al, 2010). In our series only one eye (2.5%) had a recurrence. Foroutan et al (2011) had a recurrence rate of 13.33% (2 eyes out of 15) in three year follow up with autologous fibrin.

Using similar procedure as ours, Wit et al (2010) had no recurrence in 15 eyes with a mean follow up of 9.2 months. Graft retraction, was seen in 3 eyes (7.5%) in our series which disappeared once the chemosis was controlled. It did not affect the final position of the graft. Graft retraction occurred in 20% cases in Foroutan et al (2011) series.

Wit et al (2010) postulated that sutureless and glue free graft resulted in an even tension across the whole of the graft interface and no direct tension on the free graft edges resulting in reduced stimulus for the formation of subconjunctival scar. Graft dehiscence is a recognized complication of using tissue glue (Uy et al, 2005; Srinivasan & Slomovic, 2007). With autologous fibrin, dehiscence occurred in 13.33% cases and was attributed to a low concentration of thrombin and fibrinogen in the autologous glue as compared to commercial preparation. Graft dehiscence occurred in two of our eyes, of which one resulted following trauma and the other was the result of accidental inclusion of Tenon's tissue in the free graft. The importance of a thin graft with

careful dissection from the Tenon's capsule is mandatory for a successful graft take up.

None of our patients developed corneal ulcer, scleral melting, conjunctivitis, dellen, symblepharon formation, excessive bleeding, injury to medial rectus muscle, secondary glaucoma, iritis, corneal perforation or corneal ulcer.

Conclusion

Sutureless and glue free limbal conjunctival autografting with autologous plasma following pterygium excision results in mild pain, no foreign body sensation with good aesthetic and functional outcomes. This surgery is a safe, effective and economical option for the management of primary pterygium requiring surgical intervention.

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increases by one million people.*