Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.elsevier.com/locate/mjafi

Case Report

Conjunctival limbal autograft transplantation in pterygium surgery by natural haemostasis

Lt Col Sonali V Kumar^{a,*}, Col Shrikant Waikar^b, Brig V K Srivastava^c^a Graded Specialist (Ophthalmology), Military Hospital, Mhow, India^b Senior Advisor (Ophthalmology), Command Hospital (West Command), Chandimandir, India^c Brig Med, 15 Corps, C/o 56 APO, India

ARTICLE INFO

Article history:

Received 15 March 2012

Accepted 10 February 2013

Available online 9 May 2013

Keywords:

Pterygium surgery

Autograft

Haemostasis

Introduction

History of pterygium surgery dates back to 1000 BC.^{1,2} In earlier days “Bare Sclera” technique for pterygium removal was popular, as it was considered simple procedure. However, simple excision was associated with a high rate of recurrence that may be more aggressive than the initial lesion.³ Subsequently, many techniques aimed at preventing recurrence have been described like radiation treatment and the use of antimetabolite chemicals that prevent the growth of tissue.⁴ Currently the most widely used technique involves excision of the pterygium and covering of the defect with conjunctival autograft or amniotic membrane. Initially, sutures were used to cover the defect with conjunctival autograft. Recent report favour the use of fibrin glue above sutures with improved comfort, decreased surgical time, reduced complication of recurrence rates.⁵ Conventional suturing causes complications like foreign body

reaction, infection, scarring in maximum no of patients.⁵ Their application is slow and needs skill. In the search of solution of these problems, concept of tissue adhesive was floated.⁶ Fibrin glue is a biological tissue adhesive which initiates the final stages of coagulation when a solution of human fibrinogen is activated by thrombin. However, plasma derived fibrin glue has the potential risk of prion disease transmission and anaphylaxis in susceptible individuals. In our case, we have achieved conjunctival limbal autograft adherence by natural haemostasis. Natural coagulation in human tissue begins almost instantly whenever there is an injury to the blood vessel endothelium. Fibrin clot which is formed through coagulation cascade allows to secure a conjunctival limbal autograft in place on the eye.⁷

Case report

A 42-years old patient reported in our Eye department on 20 Jan 2012 with complaint of a growth over nasal aspect of the left eye since 02 yrs. Initially the growth was small, which gradually progressed over the years to the present size. He also gave history of blurred vision & redness in the left eye. He did not give any history of trauma/discharge/pain/floaters/photopsia.

Eye examination revealed vision 6/6 in the RE and 6/12 in LE. On refraction astigmatism of −0.50 DS/−1.50DC X 70° was found in the LE. Anterior and posterior segment in the RE were normal. Anterior segment in the LE showed fleshy triangular mass encroaching 2.0 mm from the limbus to the visual axis (Fig. 1). Rest of the anterior segment and posterior segment

* Corresponding author.

E-mail address: sonaliv91775@hotmail.com (S.V. Kumar).

0377-1237/\$ – see front matter © 2013, Armed Forces Medical Services (AFMS). All rights reserved.

<http://dx.doi.org/10.1016/j.mjafi.2013.02.006>

Fig. 1 – Nasal pterygium (LE): preoperative appearance.

were normal in the LE. IOP with NCT revealed 12 mmHg in the both eyes.

The patient was diagnosed to have left primary pterygium with astigmatism. Patient was taken up for surgery. We operated on him under peribulbar block. Pterygium excision was done. No cautery was performed to allow blood to accumulate which provides autologous fibrin which causes adherence of graft. 1 mm oversized graft was taken from superior conjunctiva. The limbal edge of the graft was carefully positioned at the limbal tissue edge. No attempt was made to directly close the full extent of the excision wound, allowing natural graft positioning without tension. Small central haemorrhages under graft were tamponaded with direct compression using non toothed forceps until haemostasis was achieved. The stabilization of the graft was tested with a Johnson bud centrally and on each free edge to ensure firm adherence to sclera (Fig. 2). Postoperatively patient was given steroid drops QID for 6 weeks and antibiotic drop for 2 weeks. Graft was found well secured in place.

Fig. 2 – Nasal pterygium (LE): postoperative appearance with graft in place.

Table 1 – Demographic profiles of the cases.

Case no	Age	Sex
1	40	M
2	42	F
3	34	F
4	45	M
5	38	F
6	43	F

Subsequently, we performed the same procedure in total 6 patients. There were 04 female and 2 male patients. All were between 30 and 45 yrs & residents of Rajasthan (Table 1). All patients had primary nasal pterygium & size of the pterygium was between 2 and 4 mm. The common symptoms were redness, irritation & blurring of vision (Table 2). Post-operatively in two patients (33%) graft was found congested, in one case (16%) graft dislocation occurred on first postoperative day. All postoperative patients were followed up for 06 weeks and in 80% of our cases graft was found attached (Fig. 3).

Discussion

Pterygium, a common disorder, is a triangular shaped growth of bulbar conjunctival epithelium and hypertrophied subconjunctival connective tissue in the medial and lateral palpebral fissure encroaching onto the cornea. Well-known risk factors are genetic predisposition, immune mechanism and chronic environmental irritation including UV rays, wind and dust.^{1,2} The basic aim of pterygium treatment is to excise the pterygium and prevent its recurrence and other complications as well.

The rate of recurrence rate of primary pterygium after simple excision is reportedly 25–45%.³ The recurrent pterygium is usually associated with more severe conjunctival inflammation, corneal involvement and adhesion with surrounding tissue than the primary pterygium causing conjunctival congestion, ocular pain, ocular movement dysfunction and diplopia which cause more discomfort to the patient.³

In present era the preferred method to prevent pterygium recurrence is conjunctival limbal and amniotic membrane transplantation. But both these technique need the use of sutures or fibrin glue for adherence and are therefore vulnerable to associated complications.⁸

Table 2 – Clinical profiles of the cases.

Case no	Duration	Size	Associated symptoms
1	2	2 mm	Redness, irritation
2	3	4 mm	Redness, irritation, blurred vision
3	2	2 mm	Redness, irritation
4	2	2 mm	Redness, irritation
5	3	4 mm	Redness, irritation, blurred vision
6	2	4 mm	Redness, irritation, blurred vision

Fig. 3 – Nasal pterygium (LE):postoperative appearance after 6 weeks.

Sutures are commonly associated with prolonged wound healing and fibrosis. Other complication like pyogenic granuloma, symblepharon, forniceal contracture, ocular motility restriction, diplopia, scleral necrosis are very difficult to manage.⁵

The advantages of using fibrin glue for attaching graft include ease of use, shorter operating time and less post-operative discomfort. Moreover, conjunctival limbal autograft will be better accepted by the patient, because the use of fibrin glue produces less subjective symptoms.⁶ Though fibrin glues are considered safe, but they carry the risk of transmissible disease as they are manufactured from human plasma.⁹ Fibrinogen compounds may also be susceptible to inactivation by iodine preparation usually used for conjunctival disinfection before pterygium surgery.¹⁰ In addition, cost of fibrin glue makes pterygium surgery expensive for the patient.

In our case superiority of commercially available fibrin glue over fibrin formed by natural haemostasis in the bare scleral wound site has not been compared. Our main emphasis is on adherence of conjunctival limbal graft in place by allowing natural haemostasis to occur and without using suture/glue. In natural haemostasis coagulation pathway is activated which leads to formation of cross linked fibrin clot which allows adherence of graft to the recipient bed. It is a simple

procedure, time saving, inexpensive, no special skill is required and suture/glue related complications can be avoided. This technique can be considered as one of the alternative to conventional suturing and tissue adhesive. The only disadvantage of this procedure is that graft looks very congested on 1st postoperative day, as no cautery is performed to stop bleeding during surgery.

Conflicts of interest

All authors have none to declare.

REFERENCES

1. Bidyadhar NK. Pterygium: ancient and modern concepts. *Antiseptic*. 1941;38:382–386.
2. Rosenthal JW. Chronology of pterygium therapy. *Am J Ophthalmol*. 1953;36:601–616.
3. Sanchez-Thorin JC, Rocha G, Yelin JB. Meta-analysis on the recurrence rates after bare sclera resection with and without mitomycin C use and conjunctival autograft placement in surgery for primary pterygium. *Br J Ophthalmol*. 1998;82:661–665.
4. Amano S, Motoyama Y, Oshika T, et al. Comparative study of intraoperative mitomycin C and beta irradiation in pterygium surgery. *Br J Ophthalmol*. 2000;84:618–621.
5. De Wit D, Athanasiadis I, Sharma A, Moore J. Sutureless & glue conjunctival autograft in pterygium surgery: a case series. *Eye*. 2010;24:1474–1477.
6. Koranyi G, Seregard S, Kopp ED. Cut and paste: a no suture, small incision approach to pterygium surgery. *Br J Ophthalmol*. 2004;88:911–914.
7. MacFarlane RG. An enzyme cascade in the blood clotting mechanism, and its function as a biochemical amplifier. *Nature*. 1964;202:498–499.
8. Ang LP, Chua JL, Tan DT. Current concepts and techniques in pterygium treatment. *Curr Opin Ophthalmol*. 2007;18:308–313.
9. Groner A. Pathogen safety of plasma-derived products—Haemate P/Humate-P. *Haemophilia*. 2008;14(suppl 5):54–71.
10. Gilmore OJ, Reid C. Prevention of intraperitoneal adhesions: a comparison of noxythiolin and a new povidone–iodine/PVP solution. *Br J Surg*. 1979;66:197–199.