

To study the management of primary pterygium by surgical excision with conjunctival autograft with limbal stem cells in a tertiary care hospital in hilly area of North India

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Abstract

Aim: The aim is to study the management of primary pterygium by surgical excision with sutureless conjunctival autograft with limbal stem cells.

Materials and Methods: Patients with advanced pterygium were recruited from eye outpatient department (OPD) of rural tertiary care hospital of central India from January 2016 to October 2016. Informed written consent was taken before enrollment. The total 54 eyes (of 42 patients) were operated for pterygium with conjunctival autograft with limbal stem cells. Graft margins were buried around 0.25mm below the host conjunctiva.

Results: The mean age of the patients was 48.71 ± 12.87 years. The male patient were 30 (38 eyes, 71.43%) and females were 12 (16 eyes, 28.57%). The most common age group of presentation was 40 to 60 years (28 patients, 66.67%), followed by 61 to 80 years (10 patients, 23.81 %) and lastly age less than 40 years (4patients, all female, 9.52%). At the follow up of 6 months 1 eyes showed recurrence and at 1 year 1 eyes showed recurrence. The recurrence was 3.70 percentage at 1 year of follow up. The recurrent pterygium were reoperated with pterygium excision with mitomycin C (0.02). The patients with recurrence have completed 2 months follow up without any signs of recurrence. In 28 patients (51.85%) showed improvement in visual acuity (2 or more lines) on Snellen chart.

Conclusion: Management of primary pterygium by surgical excision with sutureless conjunctival autograft with limbal stem cells is a effective surgical technique in preventing recurrence of pterygium and good cosmetic appearance of eyes after pterygium surgery.

The author recommends use of Mitomycin C (MMC) or 5 Fluorouracil (FU) only in selected cases pterygium like extensively infiltrating pterygium or recurrent pterygium.

Keywords: Conjunctival autograft, Pterygium surgery, Stem cells.

Introduction

Pterygium is a cosmetically disfiguring common disorder of ocular surface and causes severe visual impairment in advanced stages. Histologically, primary pterygium is an elastotic degeneration of the sub epithelial connective tissue¹ which grows horizontally as a triangular fibro vascular tissue from the bulbar conjunctiva, passing the limbus, and encroaching onto the cornea.² It produces a lot of discomfort to the patients in terms of foreign body sensation, irritation, lacrimation, cosmetic blemish, and functional impairments in form of decreased visual acuity and difficult fitting of contact lenses. The exact mechanism for its causation not clearly delineated. However, prolonged exposure to ultraviolet light especially and chronic irritation of eye from dry, dusty environment plays major role in its causation.^{1,4} For surgical excision, main indications are impending or manifest visual loss due to involvement of the central cornea and high irregular astigmatism, impairment in ocular movements, cosmetic concern and possibility of squamous neoplasia in long standing atypical cases.⁵ For this variety of surgical procedures have been defined with aim directed at excision, little recurrence rates and restoration of integrity of ocular surface. The

major limitation of simple excision of the pterygium is associated recurrence rate as high as 30% to 100%.⁶ Therefore, various adjunctive strategies such as postoperative beta irradiation, intraoperative and postoperative antimetabolites, and various techniques of conjunctival limbal auto grafts have been used to attain lowest rates of recurrence.^{7,8} Nowadays, conjunctival limbal auto grafting with or without use of intraoperative and postoperative mitomycin C are the most commonly employed adjunctive measures to attain the lowest recurrence rate.⁹ Most studies advocate the use of thin graft without Tenon's fascia incorporating limbal stem cells and must be large enough to cover completely the bare sclera.⁸ This study was carried out in Hilly area based tertiary care hospital of North India with an aim to determine the long term success rate of surgical excision of primary pterygium with suture less auto conjunctival limbal graft in terms of recurrence rate and visual acuity improvement.

Materials and Methods

From January 2016 to October 2016, total 54 eyes (of 42 patients) with primary progressive pterygium(fleshy, vascularised with 2 mm or more encroachment onto the cornea) who presented to the

Ophthalmology Department were surgically excised and suture less conjunctival limbal auto graft was used as adjunctive procedure to minimise the recurrence rates. Comprehensive ocular examination was done in all patients. Patients with any other form of ocular surface disorder or ocular disease, any previous ocular surgery, dry eye, collagen vascular disorder, pregnancy and single eyed were excluded from the study. Institutional review board and ethics committee approval was taken. Informed consent was obtained from all patients. The medications Ciprofloxacin 0.3% and dexamethasone 0.1% eyedrops (3 times a day) advised one day before scheduled surgery. The surgical technique employed uses the guidelines given by Kenyon et al¹⁰ who suggested that the harvesting of conjunctival auto graft should continue 2 mm away from limbus into the clear cornea to harvest limbal stem cells. For local anaesthesia, a 1:1 mixture of xylocaine 2% with Adr and bupivacaine 0.5% was given 5 ml into peribulbar space. For surface anaesthesia, 0.5% proparacaine eye drops were also used. Body of the pterygium was excised 4 mm posterior to the limbus using Westcott scissors with special care to prevent injury to insertion of the adjacent medial rectus muscle. The dissection was extended down to the bare sclera and anteriorly to the limbus where the head of the pterygium was separated from the corneal epithelium 2 mm anterior to it. Bleeding points, if any were cauterised using wet field diathermy. Any residual pterygium tissue over the corneal defect was shaved off using the crescent. The size of conjunctival auto graft required to sufficiently cover the exposed bare sclera was determined by taking the measurements using the Castroviejo callipers. The measured dimensions were marked on the site for harvesting the graft, most commonly the superotemporal bulbar conjunctiva. A non-toothed conjunctiva holding forceps was used to hold the globe in position and balanced salt solution injected subconjunctivally to separate the graft from underlying tenon's capsule. Thin graft was dissected carefully without buttonholing using crescent blade until the limbus was reached and 2 mm clear cornea was seen from anatomical limbus. Conjunctival limbal graft was then separated using Westcott scissors, rotated to maintain limbus to limbus orientation and moved to the site of placement. The free graft was then placed over the bare scleral bed and its free margins were buried around 0.25mm below the host conjunctiva. No conjunctival sutures were used. The donor site was left as such without closure of the defect for spontaneous natural epithelization. For eyes with recurrence, Mitomycin C was applied intraoperatively using 5mm sponge soaked with 0.02% (0.2mg/mL) mitomycin C solution, applied topically over the bare sclera for 3 min atleast. Postoperatively, a soft bandage contact lens was then applied to all patients for at least one week.

Mild steroid- antibiotic combination eye drops and artificial tear drops four times a day were prescribed postoperatively to all the patients for four weeks and tapered over 8 weeks. All demographic, preoperative, intraoperative and postoperative details of all cases were noted meticulously. Follow up clinical review of all the subjects was carried out by the same surgeon on the 1st, 7th and 15th postoperative day and thereafter every 4 weeks for 6 months, and then every 8 weeks until the last follow up. During follow up; best corrected visual acuity, refractive error, loose graft, wound healing and symblepharon were noted carefully. Any other complication or recurrence of pterygium was also noted. Definition given by Singh et al¹¹ for recurrence of pterygium as a fibro-vascular in-growth of 1.5mm or more beyond the limbus with conjunctival drag was used to classify the subjects. Clinical photographs of all patients who attended the follow-up were taken.

Results

This study was carried out on total 54 eyes (of 42 patients) presented with primary progressive pterygium. The mean age of the patients was 48.71 ± 12.87 years. The male patient were 30 (38 eyes, 71.43%) and females were 12 (16 eyes, 28.57%). Table 1 shows the demographic profile of the patients. The most common age group of presentation was 40 to 60 years (28 patients, 66.67%), followed by 61 to 80 years (10 patients, 23.81 %) and lastly age less than 40 years (4patients, all female, 9.52%) (Table 2).In all patients, pterygium was nasal in location. Intraoperative complications were nil in all cases. Various postoperative complications observed are shown in Table 3. Mean follow-up period was 12 months (range 10-14 months). The recurrence rate was 5.5%.At the follow up of 6 months 1 eye showed recurrence and at 1 year 2 eyes showed recurrence. The recurrent pterygium was reoperated with pterygium excision with mitomycin C (0.02%). The patients with recurrence have completed 2 months follow-up without any signs of recurrence. In 28 patients (51.85%) showed improvement in visual acuity (2 or more lines) on Snellen chart.

Table 1:

Demographic Data	
Characteristic	
Total No of cases	42
Total No of eyes	54
Males	30 (38 eyes, 71.43%)
Females	12 (16 eyes, 28.57%)
Male to Female ratio	2.5:1
Age (range)	35-62 years
Age (Mean)	48.71 ± 12.87 years
Size of Pterygium (range)	1.8-3.8 mm
Size of pterygium (mean)	3.1 mm

Rate of recurrence	5.50%
Follow up (Mean, range)	12 month; Range 10-14 months
Time of recurrence	6 month & 12 month

Table 2:

	Age Subgroups		
	<40 years	41-60 years	61-70 years
No. of cases	4	28	10
Percentage	9.52%	66.67%	23.81%

Table 3:

Complications	Percentage
Delayed wound healing	9.8%
Loose graft	10%
Persistent congestion after 3 weeks	4%
Recurrence rate	5.50%

Discussion

This study found more prevalence of pterygium in males, which is comparable with some studies.^{16,17} In our study, most commonly individuals above 40 years of age are affected.

Today, multiple surgical approaches for management of primary pterygium have been advocated, but all are suffering with one of the major complication of pterygium excision i.e high recurrence rate. With simple excision alone, a high incidence of recurrence ranging from 30-70% have been well documented in literature.^{3,11} As the definitive management of pterygium is surgical, still there is need for ideal adjunctive procedure with little or no recurrence to be determined. Conjunctival limbal autografting and intraoperative application of mitomycin C are the two most common adjunctive procedures in use nowadays. The recurrence rate in our study was 5.5% in a follow up period of 10-14 months which is comparable to most of studies. Conjunctival autografting is associated with reported recurrence rate of 5-39%,^{8,10} thus remained the best adjunctive procedure available for primary or recurrent pterygium.¹² As the reported literature suggests, it is the surgical technique of auto conjunctival grafting which plays major role in reducing the recurrence. In our opinion it is the meticulous inclusion of limbal stem cells in the autograft, determines the efficacy of the procedure. Figueiredo et al have also found association of limbal stem cell transplantation with low recurrence rates.¹⁸ Despite proofs of conjunctival autografting as safe and effective adjunctive procedure; however, associated with minor complications including greater technical difficulty, prolonged working time, patient discomfort, need for donor conjunctival tissue especially in eyes with pterygia on both medial and

lateral side, graft edema, graft displacement, graft necrosis, dallen formation, hematoma and subconjunctival fibrosis.^{13,14} Single intraoperative scleral application of antineoplastic antibiotic mitomycin c (0.2%) for 3-5 min is associated with recurrence rate of 3.3-12%. Unfortunately, even with use of minimum concentration for minimum period, complications associated with intraoperative application of mitomycin C including serious sight threatening complications such as glaucoma, keratitis, corneal perforation, scleromalacia, and cataract formation have been reported well in literature.¹⁵ So the intraoperative application of mitomycin c as an adjunctive procedure in all the cases of primary pterygium is still a matter of debate. Author here recommends the use of mitomycin c in selected cases, especially the recurrent pterygium. Our study demonstrated the improvement in vision in 51.85% of patients which is comparable to study by Wallid M Abdalla,¹⁹ while it is slightly lower than that observed by Oguz and colleagues who found improvement in astigmatism in 75% of cases.²⁰ Involvement of smaller number of cases in the study may be the reason for this. Postoperatively, in most of the patients, mild ocular pain, redness, watering and photophobia disappeared in the first week of follow up. Delayed wound healing until 2 weeks postoperatively observed in 9.8 %of eyes. Use of cautery to stop bleeding point may be the cause for this. Persistent congestion lasting beyond 3 weeks postoperatively occurred in 4% eyes. Reason for this was unexplained. 10% eyes showed loose graft because grafts were oversized. The extra graft was trimmed and repositioned back effectively.

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