

Pterygium excision followed by sutureless and gluefree infero-temporal conjunctival autograft

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Introduction: There are various methods available at present to reduce the recurrence after pterygium excision and the one in the trend is the sutureless and gluefree conjunctival autografting which is gaining popularity for its ease and better results than other methods.

Objective: To study the efficacy and complications of sutureless and glue free conjunctival autografting for the management of primary pterygium over a period of 7 years.

Material and Methods: A prospective, interventional case study was carried out over 300 patients having primary pterygium. Pterygium excision followed by conjunctival autografting without using any suture and glue was performed in all the patients which was followed by bandaging for 24 hours. The patients were followed up post-operatively on day 1, week 1, week 2, month 1, 2 and 3 and for recurrence upto 1 year if possible. They were examined for haemorrhage, graft edema, graft encroachment on cornea, visual acuity, refractory changes and recurrence.

Abstract

Results: The age of cases varied between 21 to 60 years. 59.33% of which were male. Subconjunctival haemorrhage was seen in 23.6% on day-1 which reduced to 8.33% at day 15 and no subconjunctival haemorrhage at the end of month 1. Serous exudate was present in 26 cases (8.67%) on day-1, which subsided within two weeks without any intervention. Graft displacement was seen in 16 patients (5.33%) and encroachment on cornea was seen in 28 patients (9.33%), tenon cyst was seen in 3 patient (1%) and recurrence was seen in 3 patients (1.0%). In 3 cases displaced graft became avascular hence were removed. Visual acuity improvement was noted in 278 patients.

Conclusion: Sutureless and glue free conjunctival autograft following pterygium excision is a safe, effective and economical option for the management of primary pterygium. Inferior conjunctival graft saves the superior conjunctiva for the future glaucoma surgery if it is required.

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Introduction

Pterygium (from the greek word pterygos, meaning "wing"; plural, "pterygia") is a triangular, wing-shaped, degenerative, fibrovascular hyperplastic proliferative tissue actively growing from the conjunctival limbal area onto the cornea. Pterygia have been known since ancient times to be removed easily and frequently recurrence. The large range of treatment options for pterygium is a reflection of the historical difficulty of preventing recurrence. Pterygium is a common disorder in many parts of the world, with reported prevalence rates ranging from 0.3–29%. A true pterygium is a condition found chiefly in the sunny, hot and dusty regions.¹⁻⁵ It is very common in India which is part of 'Pterygium Belt' as described by Cameron.⁶ Histopathologic change in primary pterygium is elastodysplasia and elastodystrophy of the subepithelial connective tissue.⁷ Pterygium is most commonly seen in elderly people, uncommon in individuals younger than 20 years of age and in people wearing glasses and is twice as common in males as compared to females. New theories concludes the possibility of damage to limbal stem cells by ultra-violet light and by activation of matrix metalloproteinases.⁸ In early cases relief can be obtained by using artificial tears or topical anti-inflammatory and decongestant drugs but in advanced cases, surgery is the definitive treatment.

Indication for surgical intervention:

1. Decreased visual acuity due to encroachment on visual axis
2. Irregular astigmatism due to pterygium
3. Restricted ocular motility resulting in diplopia
4. Most patient seeks surgical excision of pterygium for cosmetic reason

Conjunctival Transplantation

The idea of conjunctival transplantation is to bring the healthy conjunctival tissue to the diseased site to prevent recurrence. Commonly, the supero-temporal conjunctiva is used as donor if the pterygium is located nasally because of the ease in surgery. Autografting of conjunctiva usually from the same eye⁹ has shown excellent result with low recurrence and complications. Kenyon and colleagues proposed the use of free conjunctival autografting for preventing recurrence after pterygium surgery⁹ which was supported by several other studies.¹⁰⁻¹⁷ In these studies the graft was taken from the superior bulbar conjunctiva. The grafts were secured using sutures. Later on the use of fibrin glue resulted in decrease in suture related complications, intra op time and post op discomfort.¹⁸⁻²¹ Fibrin glue also carries potential risk of prion and viral transmission and anaphylaxis²² which has led eventually to evolution of sutureless and glueless

technique²³ wherein the autologous fibrin facilitates the adherence of the graft to the bed.

Conjunctival autografting without sutures and fibrin glue: Researches are going on for safety and efficacy of sutureless and glue free conjunctival autografting in pterygium surgery.²³ In this procedure resident fibrin acts as the main adhesive and graft should be as thin as possible. This procedure is devoid of ocular discomfort which is caused by sutures and hypersensitivity reaction caused by fibrin glue.

Materials and Methods

This was a prospective, non-comparative, interventional case study enrolling 300 patients with primary pterygium attending the outdoor of P.B.M Eye Hospital, Bikaner from 2010-2017. They were managed by surgical excision of pterygium with sutureless and glue free infero temporal conjunctival autograft from the same eye. Patients with history of recurrent pterygium, ocular trauma, dry eye, conjunctivitis, keratitis, other ocular surface pathologic features and major systemic illness; patients not giving consent for the procedure and not willing for further follow up visits were excluded from the study. Visual acuity, Automated Refraction, and details of slit-lamp were recorded. Characteristics of the pterygium (location, size, extent across the cornea and presence of inflammation) were noted and pterygium was graded according to the extent of cornea covered by pterygium head²⁴ (Table 1). An informed consent from all patients was taken before the procedure. All the patients were instructed to instill plain antibiotic eye drops (ciprofloxacin) two hourly one day prior to surgery.

Surgical procedure:

All of the patients underwent pterygium excision followed by infero temporal conjunctival autografting. Surgery was performed under peribulbar block. After painting and draping the pterygium was excised with the help of bard parker knife blade no 15. The keratectomy was continued up to the limbus, thus freeing the pterygium off the cornea. The scleral bed was cleaned and care was taken to ensure that the bare sclera was free of tenon's capsule. With the help of castor – veijo caliper size of bare sclera was determined to procure the infero temporal conjunctival autograft. The appropriate sized graft (approx 2 mm larger than the bare area) was procured from infero temporal conjunctiva. Care was taken to obtain graft as thin as possible without button holing. Extreme care was taken to ensure that only conjunctiva was dissected and underlying tenon's capsule was not damaged, to ensure a good post operative healing at that site. The graft was then slid over the cornea without lifting the tissue off the cornea, towards the bare sclera and it was spread and positioned there maintaining correct orientation so that the limbal side of graft corresponds to the limbal side of bare sclera. The graft was stabilized without any suture or glue (tissue adhesive). The recipient bed was encouraged to achieve natural haemostasis and relative dissection from graft placement. Graft adherence and positioning was checked at the end of the surgery by poking the graft with 30 gz needle. Pad and bandage was done and patient was put on oral analgesic-anti inflammatory tablets

twice a day for three days. The patient was allowed to go home after surgery.

Patients were examined on first day post op and then the patient was instructed to instill combination (Gatifloxacin +Prednisolone) eye drops four times a day for a week, which was later tapered in follow up visits and artificial tears (Carboxy Methyl Cellulose 0.5%) four times a day. The patient was reviewed in follow up at one week, two week, one month, two month, three month and 1 year if possible.

Result

The pterygia were divided into four grades 1-4 according to Youngson RM. The cases varied between age of 21-60 years out of 300 patients 178 were males and 122 females (Table 2) were enrolled. Maximum number of male patients were in 31-40 age group while mostly females were of 51-60 years age group (Table 3). 98 eyes had grade III pterygium (Table 1). Foreign body sensation was the most common complaints (204 patients) at the time of admission. 63 cases had cosmetic indication for surgery (Table 4). No significant intraoperative complications were noted.

Table 1: grading of 52 pterygium according to Yougson RM (1972)

Grades of pterygium	Patients
I. Pterygium invading <1.5mm of cornea	67
II. Pterygium invading <half the radius of cornea	76
III. Pterygium invading >half the radius of cornea	98
IV. Pterygium almost reaching the center of cornea	59

Table 2: Distribution of cases according to sex

Males	Females	Ratio
178 (59.3%)	122 (40.66%)	1.45:1

Table 3: Distribution of cases according to age

Age group in years	Male	Female	Total cases
21-30	54 (30.33 %)	29 (23.80%)	83 (27.66%)
31-40	64(35.95%)	23 (19.04%)	87 (29.00%)
41-50	42 (23.59%)	23 (19.04%)	65 (21.66%)
51-60	18 (10.11%)	47 (15.66%)	65 (21.66%)

Table 4: Complaints at the time of admission

Complaints	Total
Foreign body sensation, watering	204
Diminution of vision	84
Cosmetic disfigurement	63
Redness	10

Subjective complaints of patients were also taken under consideration (Table 5). Graft displacement and graft encroachment on cornea was noted in 16 (5.33%) and 28 (9.33%) cases respectively on first post operative day which were repositioned under topical anesthesia and were found to remain in place on subsequent follow up. Out of 16 displaced grafts 3 (1%) were avascular and hence were removed. The postoperative follow up was 4 weeks. For recurrence patients were encouraged for follow up of

at least 6 months and to report any time if recurrence occurs. All grafts were found to be taken up well by the 7th post operative day. Mild graft edema was noted in 25 (8.33%) cases in first week which resolved subsequently. There was hemorrhage below the graft in 3(1%) cases and in one case it persisted for 1 month and we started oral steroid and it responded well. Retention cysts was seen in 3 patient (1%) which was excised after 15 days. Corneal dellen were not noted during the period. The donor site re-epithelized in 7 to 10 days. The value of astigmatism was found to decrease from 0.50D cylinder to 7.0D cylinder at 4th week.

Table 5: Post-operative subjective complaints on follow ups

Complaints	No. of Patients					
	Day 1	Week 1	Week 2	Month 1	Month 2	Month 3
Redness	127	54	17	3	0	0
Discomfort (watering and itching)	183	75	41	0	0	0
Pain	207	0	0	0	0	0

Late Post-Operative Complications

Recurrence was the only late complication seen in 3 patient. The recurrence was not observed in the patients in which graft was removed. Recurrence was in the form of fibrovascular growth crossing over the corneo-scleral limbus on to the previous site of excision. The recurrence were observed within 6 months of surgery. This complication was recorded during early phase of our study.

Improvement in visual acuity was observed in 276 patients (1-4 lines of snellen's chart) except those who had cataract/significant lenticular changes. There had been decrease in astigmatism ranging from 0.50d cylinder – 7 cylinder in almost all cases.

Discussion

Current surgical methods to prevent pterygium recurrence include conjunctival autograft, limbal and limbal-conjunctival transplant, conjunctival flap and conjunctival rotation autograft surgery, amniotic membrane transplant, cultivated conjunctival transplant, lamellar keratoplasty²², and the use of fibrin glue. All of these techniques involve the use of sutures or fibrin glue and are therefore vulnerable to associated complications. The adjuvant use of mitomycin C and radiotherapy have been described. Radiotherapy and chemotherapy reduces the recurrence rate, yet serious complications are associated with their use.²⁵⁻³⁰ The presence of sutures may lead to prolonged wound healing and fibrosis.^{20,22,31} Subsequent complications such as pyogenic granuloma formation are easily treated; others such as symblepharon formation, forniceal contracture, ocular motility restriction, diplopia, scleral necrosis, and infection,^{32,33} are much more difficult to manage and may be sight threatening. To overcome suture related problems and to reduce the intraoperative time, fibrin glue was introduced and its efficacy for the conjunctival grafting has been established.¹⁸⁻²¹ Fibrin glues are currently manufactured

from human plasma and therefore carry the theoretical risk of anaphylaxis and transmission of prions and viruses.²² To encounter problems related with sutures and fibrin glue new technique of sutureless and gluefree conjunctival autograft in pterygium surgery came into practice which have less subjective complaints like that post operative pain, ocular discomfort and prolonged redness. This procedure have graft stability equivalent to suture and fibrin glue.

Since the use of steroids in any form has increased be it as inhaler for asthma attributed to increased pollution, topical form used for skin disease or allergic ocular diseases e.t.c risk of glaucoma development has also increased. So as to preserve the superior conjunctiva, amniotic membrane or infero conjunctival graft can be used to cover the sclera after pterygium surgery for reducing the recurrence.³¹ But amniotic membrane do possesses the risk of contamination which cannot be overlooked. Hence we can conclude that infero temporal conjunctival autografting is a better approach to preserve superior conjunctiva for the future for cataract or filtration surgeris if required.

Conclusion

Sutures are related with foreign body related complications while fibrin glue are linked with risk of transmissible disease. The opposition of the lids to the bulbar conjunctiva provides a natural biological dressing and confers a unique wound – healing environment. Infero temporal graft has an advantage of leaving the superior conjunctiva for glaucoma surgery if needed. In the view of low recurrence rate with minimum and mild complications and economical in context to our country this procedure will give us an option for a new approach towards management of pterygium.

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