



A COMPARATIVE STUDY OF THE CONJUNCTIVAL AUTOGRAFTING WITH SUTURES AND WITHOUT SUTURES IN PTERYGIUM

Ophthalmology

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ABSTRACT

BACKGROUND: A prospective, randomised case-control study conducted at a tertiary level eye care center Government General Hospital, Vijayawada between Oct 2016 and Sep 2017 to compare the outcomes of Conjunctival Autograft (CAG) with sutures and CAG with patients' own blood acting as a bioadhesive in treating pterygium after surgical excision.

MATERIALS AND METHODS: Twenty eyes of 50 patients with pterygium were randomly divided into 2 groups- group I (25 eyes) underwent CAG with the patients' own blood coagulum acting as a bio-adhesive or fixative and group II underwent CAG with sutures (25 eyes). Any ocular surface disorders, cataract, pseudopterygium, previous surgery and positive HIV and Hep B were excluded.

RESULTS: Time for the surgery was compared. Patients were then closely followed up for a period of 6 months for anatomy, outcomes of graft, recurrence rate, graft displacement, retraction, Inflammatory reaction or any other complications.

CONCLUSION: Study shows that autologous fibrin in blood is a useful alternative method for graft fixation.

KEYWORDS

Pterygium, Conjunctival Autografting, Autologous Serum.

I. Introduction

Pterygium is a fairly common condition of the eye, the existence of which was well recognized at the time of Hippocrates (460-375 BC) and Celsus who described it as 'Urigus' in his manuscripts. The earliest description of pterygium is available in the texts of the great surgeon of ancient India, Sushruta (3000 BC). Although in its early stages, this condition is symptomless, bothering some patients cosmetically but in later stages, it may cause impairment of vision due to two reasons, one by covering the pupillary area of the cornea and second by altering the curvature of the cornea due to fibrosis, with resulting astigmatism. Once it invades the cornea, it causes a corneal opacity. For management of this condition, surgery is done like Bare sclera technique with or without mitomycin C, Conjunctival autograft, Amniotic membrane graft etc.

The term pterygium comes from the ancient Greek (pteryx) = wing. Pterygium is characterized by a triangular portion of the bulbar conjunctiva encroaching onto the cornea, usually within the intrapalpebral fissure and most often from the nasal side.

Pterygium is defined as a degenerative sub-conjunctival fibro-vascular wing shaped overgrowth on to the cornea. Anatomically, pterygium can be subdivided into the head, body and tail. Pterygium is commonly seen in tropical countries as this population has increased exposure to light, dust, wind and heat. Primary pterygium is believed to be a consequence of ultra violet induced damage with subsequent elastotic degeneration of conjunctival collagen^{2,3}. In a tropical country like India, the prevalence of pterygium ranges from 9.5% to 13%.⁴

Pterygium is most common in the so-called "pterygium area", which is defined by a geographical latitude of 40° north and south of the equator¹. In this area, prevalence of up to 22% has been reported^{2,3}. In countries outside of this area reported prevalence rates usually do not exceed 2% of the general population, and the lesion affects mostly patients with an extensive exposure to sunlight^{5,6}.

Symptoms associated with pterygium development include chronic ocular surface inflammation and tearing, eventually astigmatism and blurred vision attributable to optical axis involvement¹. The natural history of the condition is variable, prolonged static periods do exist. However, progressive growth characterizes the majority of cases of pterygium, especially those affecting younger individuals, often necessitating surgical removal.

SURGICAL INTERVENTION

Pterygium surgery may lead to further clinical manifestations,

including conjunctival scars affecting ocular motility, corneal clouding, delayed epithelial healing. Postoperative recurrence rates could have been up to 50% of the cases.

Pterygium and its treatment have been described since ancient India by Sushruta in approximately 1000 BC: "...The condition disturbs both the patient, because of its appearance, and the surgeon because of the tendency to recur in a matter of weeks or months".⁷

Pterygium was also mentioned by Hippocrates around 400 B.C.²⁴ He treated it with eye drops made of lead, zinc, copper, iron, bile juices, urine and maternal milk. Celsus (25 BC) and Galenus (129 AD) also advocated complex topical solutions. Avicenna (1000 AD) proposed cutting the pterygium with scissors⁷.

Proper reconstructive surgery began in the nineteenth century with Scarpa, Arlt (use of conjunctival graft), Desmarres and Knapp. Elschning (1926) performed advanced conjunctival plastic surgery.

β-irradiation⁸ began to be used in the 1950s and the use of MMC as adjunct therapy⁹ began in Japan in the 1960s. Amniotic membrane to substitute the conjunctiva¹⁰ was used as early as in 1946 but the idea was developed and popularized by Tseng¹¹ in the 1990s.

Simple excision and suturing of the conjunctiva to the sclera (bare sclera technique) gives a high percentage of recurrences^{12,13}. However, higher recurrence rates have been reported¹² with this technique. Therefore, adjunct therapies such as beta-irradiation¹⁴ and chemotherapeutics such as MMC¹⁵ have been tried. Unfortunately, there were not only low recurrence rates but also reports of serious side effects^{16,17}.

Limbal Conjunctival autograft (CAG) is the gold standard in the management of primary pterygium.¹⁸ Limbal Conjunctival autografting has also been advocated for the management of recurrent pterygium.¹ To avoid recurrence conjunctival autograft with mitomycin use is an option however there is a risk of scleral necrosis. Conjunctival graft may be held in place either with sutures or fibrin glue. Use of fibrin glue has gained the popularity to circumvent the use of sutures and its associated complications. Apart from increasing the cost of surgery there is a potential risk of anaphylaxis. conjunctival autograft is currently the most popular surgical procedure. The most common method of autograft fixation is suturing. But, it has its own drawbacks like increased operating time, postoperative discomfort, inflammation, buttonholes, necrosis and giant papillary conjunctivitis. Conjunctival graft may be held in place either with sutures or CAG

with patients' own blood acting as a bioadhesive in treating pterygium after surgical excision. If the time is given for the blood to collect and then for the adherence of the graft to the bare area, adequate adhesion can be achieved. The apposition of the lids to the graft bed facilitates a biological dressing and confers a wound-healing environment.

The basic goals of good pterygium surgery are to cleanly remove pterygium tissue from the ocular surface and to prevent recurrence. Today, satisfactory cosmetic results are also a concern.

In this study we have used autologous blood for achieving the adherence of the conjunctival auto-graft and compared the technique with that of conventional sutured auto-graft for primary pterygium surgery.

Aim : To compare and evaluate the outcome of sutureless CAG with autologous blood coagulum versus CAG with sutures for primary pterygium.

II. Materials and Methodology :

Study design: This was a prospective study conducted at Government General Hospital, Vijayawada between Oct 2016 and Sep 2017. Fifty patients diagnosed with pterygium were included in the study based on the following inclusion and exclusion criteria. The study was approved by institutional ethics committee.

Inclusion criteria:

1. Either Sex
2. Patients aged more than 18yrs who presented with pterygium
3. Those were symptomatic (redness, cosmetic, irritation, watering)
4. Patients with pterygium threatening the visual axis were included in the study.

Exclusion criteria:

1. Atrophic pterygium,
2. Pseudopterygium,
3. Recurrent pterygium with multiple surgeries,
4. Any other limbal surgery,
5. Ocular surface disorders,
6. Glaucoma,
7. Retinal pathology requiring surgical intervention,
8. History of previous ocular surgery or trauma,
9. HIV/Hepatitis B.

The patients who met the inclusion criteria and consented for the study were included. They were assigned to one of the two treatment groups. Patients under group1 underwent a pterygium excision along with autologous blood assisted sutureless conjunctival auto-graft. Patients were assigned to group 2 underwent pterygium excision along with suturing of conjunctival autograft.

Pre-operative workup: All patients underwent a comprehensive ophthalmologic examination including visual acuity, refraction, slit lamp bio-microscopy, measurement of intraocular pressure, extra-ocular muscle movements and dilated fundoscopy. These patients were followed up to minimum of 6 months postoperatively.

Procedure Methodology : Peri bulbar anaesthesia was given preoperatively.

Group 1: Autologous blood assisted suture less conjunctival auto-graft group: The body of the pterygium was dissected 4 mm from the limbus down to the bare sclera. Pterygium was removed from the cornea by avulsion. Only the thickened portion of conjunctiva and the immediate adjacent and subjacent Tenon's capsule showing tortuous vasculature were excised. Patients in this group underwent pterygium excision followed by autologous blood assisted conjunctival auto-graft. The graft was taken from superior 12 o'clock position. Care was taken to include as little as possible of Tenon's tissue in the graft. graft was placed on bare sclera and positioned so as to maintain the limbus-limbus orientation. In this group haemostasis was allowed to occur spontaneously without use of cautery to provide autologous fibrin to glue the conjunctival autograft and the scleral bed was viewed through the transparent conjunctiva to ensure that residual bleeding did not lift the graft. The graft was held in position for 5-10 min by application of gentle pressure over the graft with fine non-toothed forceps. Graft adherence and positioning is examined 5-10 min after grafting. During

small bleed in the scleral bed, there is always a small ooze of the serum, which acts as adhesive. Large bleed lifts the graft from scleral bed with subsequent complications and should be tamponade before placing the graft.

Group 2: Sutured conjunctival auto-graft: Patients in this group underwent conjunctival auto graft with conventional method of suturing using 10-0 nylon. First the two limbal corners were sutured into the episclera and then the posterior corners of the graft were sutured to the bulbar conjunctiva.

Postoperative Follow-up :

In both the groups a pressure eye patch was applied for 24 hours, systemic analgesia was given twice daily. Topical steroid antibiotic combination (moxifloxacin with Prednisolone) four times daily was started from the first post-operative day which was gradually tapered over 4 weeks while topical lubricating eye drops 4-6times/ day was prescribed for four to six weeks. The patients were instructed to wear protective glasses to avoid direct sun exposure, dust and also asked not to rub their eyes.

All patients were followed up 1 day after surgery, then weekly for the first one month. Later they were reviewed at 3months and at 6th month. They are examined for haemorrhage, chemosis, wound gape, graft shrinkage, graft dehiscence, recurrence or any other complication.

The outcome of this study was to determine the incidence of recurrence and patient's satisfaction, Operative time-Calculation, gained visual acuity postoperatively in each procedure measured. The groups were compared with regards to the surgical time. Total surgical time was from first conjunctival cut to removal of lid speculum, i.e. the time taken from the excision of pterygium to the time to secure the graft on the bed.

III. RESULTS

Table 1 : Sex Ratio

Female	33
Male	17

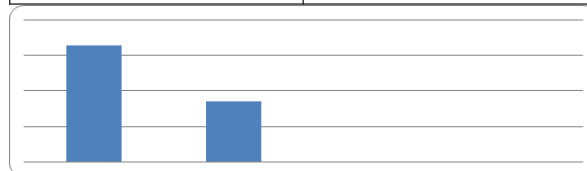
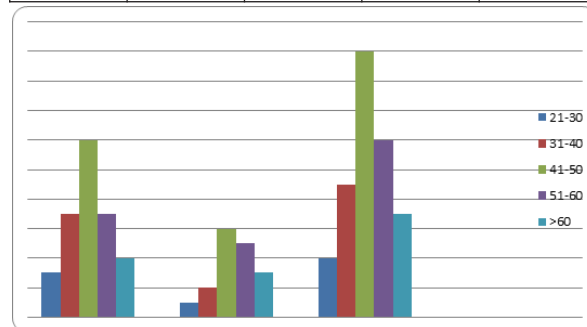


Table 2 : Age Distribution

S.No	Age	Female	Male	Total
1	21-30	3	1	4
2	31-40	7	2	9
3	41-50	12	6	18
4	51-60	7	5	12
5	>60	4	3	7



A total of 50 eyes of 50 patients were studied. Patients were divided into 2 groups; group 1 consisted of patients who underwent sutureless limbal conjunctival autografting and group 2 comprised of patients who underwent suturing for limbal conjunctival autografting. The average surgical time for group 1 was 18-20 minutes and for group 2 was 30 minutes (p-value = 0.001). Postoperative symptoms were seen in 2 (20%) patients in group 1 and 8 (80%) patients in group 2 (p-value <0.002) as per table 3.

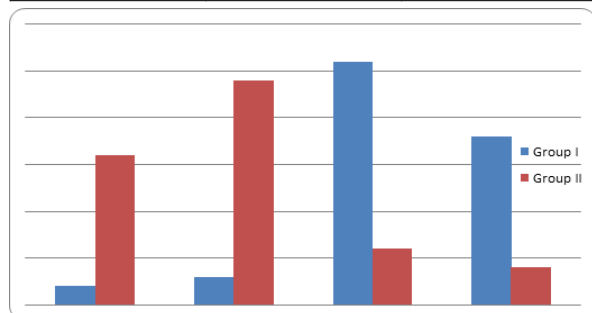
Table 3 : First week Post Operative follow up

Symptoms and Complications	Group I (Without sutures and Autologous serum)	Group II (With 10-0 Nylon sutures)
Pain	2	8
Foreign body sensation	0	8
Operation Time	18-20 minutes	30 minutes
Graft displacement	2	0
Wound gape	1	0
Haemorrhage	0	0
Graft shrinkage	0	0
Chemosis	0	4

In our study, it shows that 9 cases are highly satisfied i.e 36% , Moderately satisfied are 13 cases i.e 52% in group I (without sutures, with autologous serum), where as In Group II (with sutures) Unsatisfied cases are 8 i.e 32% and low satisfaction levels are seen in 12 cases i.e 48% as per table 4.

Table 4 : Patient satisfaction-3 to 6 week

Satisfactory levels	Group I	Group II
Unsatisfied	4%	32%
Low satisfaction	8%	48%
Moderate satisfaction	52%	12%
Highly satisfied	36%	8%



In our study, we didn't get any recurrence of cases during the six months visit follow up as per table 5

Table 5 : Recurrence Rate

Group	Count	Percent
Group I	0	0%
Group II	0	0%

IV. Discussion

The aim of pterygium surgery is to excise the pterygium and prevent its recurrence. In order to reduce the incidence of recurrence variety of techniques, such as amniotic membrane graft conjunctival autograft, and limbal conjunctival transplant and use of fibrin glue have been tried^{1,19,20}. The most preferred surgical procedure post pterygium excision is conjunctival autografting using sutures mainly because of its lower recurrence and complication rate.³ Although it is considered as a safe and effective surgical technique it requires more surgical expertise and more surgical time.²¹ In our study we compared this established technique with a suture less surgical technique. A suture less technique is quicker at the same time avoids complications of suture like infection and increased inflammation, also according to Sridhar et al²² there is no role of suture in wound healing and may traumatise adjacent tissue as well.

To help the graft adhere to the scleral bed commercially available fibrin glues from pooled human plasma is commonly used, it carries a risk of transmissible diseases like hepatitis A and parvovirus^{23,24}. To prevent this in our study we used autologous blood serum easy way to procure fibrin for graft adhesion. After the securing conjunctival autograft using autologous blood, we patched the eyes for 24 hours. Patients were instructed strictly "not to rub their eyes" for 24 hours. The good apposition of lids over the bulbar conjunctiva itself acts as a biological dressing helping in excellent wound healing. Vascularization of episcleral bed within a week post grafting as reported by Tayanç et al^{25,26} will be further enhanced by autologous blood, resulting early firm adhesion of the graft over the episcleral bed thereby preventing occurrence of recurrence.

In our study we did not any recurrence in both the groups, compared to other studies Hirst and Ang et al^{27,28} rate being 2%-39%. The operating time in both groups and postoperative symptoms complained in conventional techniques group with sutures were comparable to studies done by Kim, Koranyi and Allan et al.^{29,30,31}

V. CONCLUSION

Sutureless limbal conjunctival auto grafting with autologous serum is a new novel technique for the treatment of primary pterygium. Not only the surgical time required is less, but also the complications encountered are fewer than suturing technique.⁸ Moreover, the feasibility and absence of cost factor, tedious suturing process and potential adverse reactions encountered with the use of foreign material make it superior to suturing. More research with longer follow up is required to add to the knowledge about both the techniques.

In conclusion, the use of autologous blood for the attachment of conjunctival autografts in pterygium surgery is an effective procedure to reduce the risk of recurrences. This technique not only shortens there operating surgical time but also delivers good results and can be a safe alternative to graft with suturing. Most of our patients were highly satisfied in the suture less group as they had minimal postoperative discomfort and had early recovery. Comparable results in both the groups indicate that, this technique can be considered as alternative method of conjunctival autograft after pterygium excision in developing countries.

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