
ORIGINAL ARTICLE

**Study on Effectiveness of Pterygium Surgery with Conjunctival Autograft
Using Autologous Serum**

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Abstract:

Introduction:

Pterygium is a wing shaped fold of conjunctiva encroaching onto the cornea¹. Surgical excision with conjunctival autograft is a treatment of choice¹. Autograft can be secured either with autologous serum, fibrin glue or sutures. In our study we aimed at assessing the efficacy of conjunctival autograft using autologous serum.

Materials and Methods:

A prospective randomized control study included 50 eyes that have undergone primary pterygium excision with conjunctival autograft using autologous serum at a tertiary care centre. Intraoperatively patients were evaluated for surgical time, ease of technique and cost effectiveness. Postoperatively patients were assessed regarding graft placement and patients comfort. During follow up after 8 days, 15 days, 2 months, 6 months, and one year, patients were evaluated for graft adherence and recurrence of pterygium.

Results:

Of the 50 eyes analyzed, 44 eyes had well placed conjunctival autograft in post-operative period and 4 eyes had displaced graft. Two eyes had recurrence of pterygium during follow-up of one year. Overall time required for conjunctival autograft (CAG) with autologous serum is around 20-25 minutes which is very less as compared to suturing technique. In rural setup, use of fibrin glue for CAG is inaccessible and expensive but autologous serum could be cost effective.

Conclusion:

Pterygium excision with conjunctival autograft using autologous serum is very cost effective and time saving procedure. Graft displacement and recurrence rate are also less. There is reduced surgical time, less post-operative discomfort, safety and cost effectiveness with conjunctival autograft using patients own serum.

Key words: Conjunctival autograft, Pterygium, Autologous serum

Introduction:

Pterygium is a triangular wing shaped proliferation of conjunctiva on cornea in the interpalpebral area. The subconjunctival tissue proliferates as vascularised granulation tissue to invade and destroy superficial layers of cornea. Etiology is multifactorial with features of both degenerative process and disordered growth¹. It has 3 parts namely: apex, neck and body. It is often a bilateral condition with preponderance to nasal side. Visual impairment due to astigmatism or progression of tissue in pupillary area can occur. Restriction of ocular motility or cosmetic disfigurement can cause ocular morbidity in late stage.

Pterygium is caused by fibrovascular overgrowth or extension of connective tissue from the bulbar conjunctiva onto the cornea. As pterygium advances, it may induce irregular astigmatism and causes decrease in visual acuity. When vision is affected or the symptoms become more bothersome, excision of the pterygium is indicated. Pterygium may cause foreign body sensation and inflammation. If left untreated, it

can cause diminution of vision. Treatment of this condition is surgical excision. Pterygium excision with conjunctival autograft (CAG) technique is reported to have lower recurrence rate. Epidemiological studies have reported strong correlation between pterygium and UV radiation, hot, dry and sandy climates. The prevalence rate varies widely from 2% to 29% but it is reported to be higher in tropical regions². The present study was conducted to assess the efficacy of conjunctival autograft using autologous serum.

Materials and Methods:

This was a prospective and omized controlled study on 50 patients who had undergone pterygium excision with conjunctival autograft (CAG) using autologous serum. The study was conducted in the Department of Ophthalmology of the Government Medical College, in Aurangabad from January 2019 to January 2020. Ethical approval was granted by the institutional ethics committee of the institute. Data was analyzed using statistical software SPSS version 15 for windows by single observer.

Inclusion Criteria:

All patients of both gender having age group 25-55 years with primary progressive pterygium and those who were willing to provide written Informed consent are included in the study.

Exclusion Criteria:

The patients having recurrent pterygium, Glaucoma, Ocular surface disorders, Patients with retinal pathology requiring surgery and patients not willing to give consent were excluded from the study.

A complete ophthalmic examination was carried out in patients including visual acuity, slit lamp examination, keratometry, intraocular pressure measurement and ocular movements. Grading of pterygium was done based on Younson’s method (Table No. 1).

Graft adherence and position was noted at the end of surgery. Every patient was followed on first post-operative day, after one week, after one month, three months, six months and one year. During follow-up period graft location, wound gap, graft oedema, hemorrhage, any cyst formation or recurrence was noted.

Table No. 1: Grading of Pterygium

I	Pterygium invading < 1.5mm of cornea
II	Pterygium invading < half the radius of cornea
III	Pterygium invading > half the radius of cornea
IV	Pterygium almost orreaching the centre of cornea

Results:

Data was recorded by a single observer and expressed in terms of n (%). Unilateral pterygium was often noted with predisposition towards nasal side. Out of 50 cases, 7 had bilateral pterygium.

Out of 50 eyes, right sided pterygium was observed in 23(46%) cases while 27 (54%) had left eye pterygium.

The age group of patients varied between 22 years to 59 years of age (Table No. 2). Maximum numbers of cases were young between age group of 31 to 40 years. Thirty-eight patients (76%) were males and 12(24%) were females. Male sex preponderance was observed in the ratio of 3:1.

No significant intra operative complications were noted. Two cases had buttonholing of conjunctival graft. Sub conjunctival hemorrhage was observed in 17 cases (34%). It resolved with oral administration of Vitamin C tablets, 500 mg twice daily for 10 days without any sequel.

During next day follow up few patients had symptoms like pain and watering. Ocular discomfort in the form of heaviness and foreign body sensation were observed

in 7 cases out of 50 eyes under evaluation. One case had loss of graft on next day of follow-up.

Mild graft oedema was observed in 3 cases during 1 week follow-up which resolved on topical steroid treatment. Also, Graft retraction was seen in 4 cases on 1st day post-operative period but it was left untreated. Later it healed by epithelialization of tissue and no sequel was noted.

Later patients followed up after 7 days, 1 month, 3 months and later 6 and 12 months period. Graft displacement was observed in 4 cases and 2 patients developed recurrence of pterygium within 1 year of surgery.

Overall subjective feeling of well being and ocular comfort was also noted at the end of 3 and 6 months. No serious complications like corneal dellenormelt were observed in any of the patients. We observed complications in the form of Graft displacement in 4 cases. Under topical anaesthesia those grafts were repositioned and later it remained in place. Two cases had a recurrence in the form atrophic growth during 1-year follow-up (Table No. 4)

Table No. 2: Age distribution

Age group in years	No of Patients
20 – 30	2
31 – 40	37
41 – 50	6
51 – 60	5

Table No. 3: Symptoms

Symptoms	No of patients
Pain/watering	4
FB sensation	2
Ocular discomfort	5
Excess Redness of eye	3

Table No.4: Complications

Complications	No. of Patients
Graft displacement	4
Recurrence	2
Loss of Graft	1
Graft Oedema	3
Graft Retraction	4

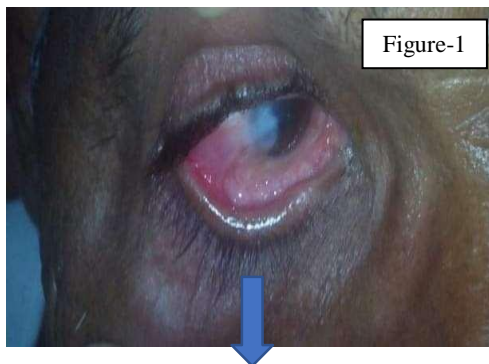


Figure 1: Progressive pterygium



Figure 2: 1 week after pterygium
Excision with conjunctival autograft

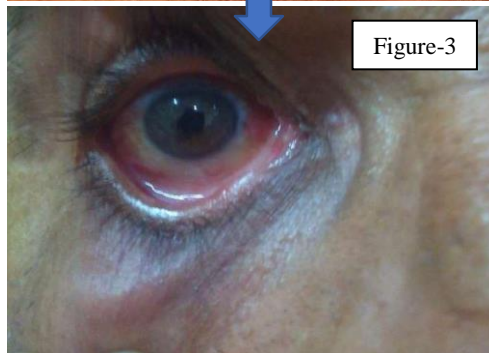


Figure 3: 1 month after pterygium
Excision with conjunctival autograft

Discussion:

Pterygium is a fibro elastotic degeneration of conjunctiva³. It has three parts; apex, neck, body and tail. The stockers line of iron deposition may be found in the front of apex. The fleshy, mobile vascular bulbar conjunctiva is known as body or tail. In 1972, Youngson and colleagues proposed grading of pterygium based on its encroachment on cornea⁴.

Pterygium patients are usually asymptomatic but may present with redness, watering, foreign body sensation and decrease in vision due to astigmatism or involvement of pupillary area. If left untreated, restricted ocular motility or cosmetic disfigurement can occur.

Pterygium may be primary or recurrent following regrowth after excision. It has two stages; in progressive stage where it is thick and vascular and continue to grow on cornea while in atrophic stage it is thin and pale and ceases to grow.

Recurrent pterygium can be treated with conjunctival autograft and Mitomycin C application or amniotic membrane.

In 2001, Di Girolamo and colleagues suggested possibility of limbal stem cell damage by UV light and activation of matrix metalloproteinase which can lead to development of pterygium⁵. According to Weinstein et al, abnormal P53 gene expression in the epithelium of pterygium increase the possibility of uncontrolled cell proliferation and chances of progression⁶.

Treatment of choice for pterygium is surgical excision with or without autograft. Various methods of surgical excision include bare sclera technique, excision with conjunctivolimbal autograft (CAG) or excision with amniotic membrane grafting (AMG). Recurrence of pterygium is treated with the use of antimetabolites or beta radiation.

Kenyon and colleagues proposed the use of free conjunctival auto grafting for preventing recurrence after pterygium surgery which was supported by several other studies⁷. He and his colleagues in 1985

used superotemporal bulbar conjunctival auto graft from same eye in 57 eyes and found excellent results with very low recurrence rate of 5.3%⁷.

Conjunctival autograft can be placed with glue, sutures or using autologous blood. The presence of sutures may lead to prolonged wound healing and fibrosis. Symblepheron formation, forniceal contracture, ocular motility restriction, diplopia, scleral necrosis, and infection etc. can also occur in cases where sutures are used^{8,9}.

DeWit D et al in 2010 published a study on 15 eyes with CAG using autologous blood and showed good results in terms of graft stability and recurrence¹⁰.

Replacement of sutures with fibrin glue can reduce surgical time but increases post-operative discomfort^{10,11}. This also carries potential risk of prion and viral transmission and anaphylaxis which has eventually led to the evolution of sutureless and glueless technique where in the autologous serum facilitates the adherence of the graft to the bed¹². The fibrin present in blood is a biological tissue adhesive glue. It contains coagulation factors and acts as local haemostatic. First reported use of fibrin as an adhesive was in 1909. It can be prepared from homologous or autologous source. The use of autologous serum is cost effective and results in less post-operative discomfort and inflammation. Also there is reduced risk of hypersensitivity reaction and wound infection. Karalezli A et al compared CAG using fibrin glue and sutures in 50 eyes. They showed that CAG using fibrin glue had less operative time and less recurrence as compared to using sutures¹³.

A study by Shrinivasan et al compared 40 eyes with conjunctival autografting using sutures and autologous blood or serum. They showed CAG using autologous blood is effective and safe with fewer complications¹⁴.

In 2013, a study done by Singh Punit K et al showed rate of recurrence is same in CAG using sutures or

autologous blood but graft displacement is more with CAG using autologous blood but the difference is not statistically significant¹⁵.

Few possible complications of pterygium surgery with CAG are transient graft oedema, graft displacement, localised dellen formation or tenon's cyst. But these can be managed during follow up and doesn't leave any sequel.

Conclusion:

A prospective randomized study of pterygium excision with CAG using autologous blood at tertiary care centre showed that conjunctival autograft is probable source of stem cells. In developing country like India and especially in government setup with limited resources autologous serum has proven cost effective. Graft displacement and the rate of recurrence is minimal. Subjective wellbeing of patients due to lack of suture related problems is major advantage in CAG.

Conflict of Interests-Nil

Sources of Support- Nil

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