

## A comparative study of post-operative outcomes of pterygium excision with autograft using autologous blood and sutures

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### Abstract

**Aims:** To compare the two modes of treatment in pterygium surgery in terms of postoperative outcomes and duration of surgery.

**Materials and Methods:** Prospective study was conducted from September 2017 to June 2018 at the department of ophthalmology, Narayana medical college and hospital, Nellore. A total number of 40 cases with primary nasal pterygium were selected from outpatient department for surgical intervention. The patients were randomly divided into two groups for pterygium excision with autograft using either autologous blood (20 patients) or sutures (20 patients). After surgical intervention eyes were patched for 24 hours in both groups and two groups were compared for duration of surgery, recurrence, graft edema, graft stability and other complications.

**Results:** In comparison to autologous blood technique granuloma was more in suture group whereas graft edema was more in autologous blood technique after pterygium excision with conjunctival autografting.

**Conclusion:** Fixing of graft in pterygium surgery with autologous blood is a better and cost effective technique when compared with sutures without increasing complications.

**Keywords:** Autologous blood, Conjunctiva, Pterygium excision, Sutures.

### Introduction

Pterygium is a degenerative condition of subconjunctival tissue which proliferates as vascularized granulation tissue to invade the cornea, destroying the superficial layers of stroma and Bowman's membrane, whole being covered by conjunctival epithelium.<sup>1</sup> Asymptomatic pterygium is common and diagnosed accidentally. Recurrent redness and foreign body sensation are due to mechanical irritation, recurrent inflammation and tear film instability. In advanced cases, vascularized granulation tissue of aggressive, rapidly growing pterygium may invade the cornea, destroying the superficial layers of stroma and Bowman's membrane, and encroaches upon pupillary area. As a result of tissue fibrosis it may lead to alteration of corneal curvature leading to astigmatism and corneal opacity.<sup>1</sup> These patients presents with visual impairment. Pterygium is more often seen in men than in women.<sup>2</sup> This is attributed to the fact that males are exposed to dust and environmental irritants more than women. Higher prevalence noticed with increasing age. Ultraviolet rays (UVR) induced elastoid degeneration of subepithelial connective tissue,<sup>3</sup> genetic trauma and consequent altered cytokine expression<sup>4</sup> plays role in pathogenesis of pterygium. Reports suggest vascular endothelial growth factor (VEGF) is highly expressed in new vessels in pterygium tissue compared with normal conjunctiva (Marcovich, Morad et al. 2002). Therefore, angiogenesis is likely to play a role in pterygium (Marcovich, Morad et al. 2002; Aspiotis, Tsanou et al. 2007). Now a day's static pterygium of grade 1 to 2 is managed conservatively by NSAIDs and ocular lubricants as former reduces recurrent inflammation and later is given for tear film instability. Surgical removal is done only when medical measures failed to relieve the symptoms and signs or big pterygium causing, obscuration of visual axis, diplopia, and

astigmatism due to pressure by head. The main challenge of pterygium surgery is prevention of recurrence.<sup>5</sup> In recent past the debate over best approach to surgery was centered on sutures and fibrin glue to affix the conjunctival graft. Former requires good surgical skill and is associated with high postoperative suture related discomfort. Because of its biological and biodegradable properties, fibrin-based adhesives may be used under a superficial covering layer (conjunctiva, amniotic membrane, etc.) without inducing inflammation. High cost of fibrin glue, risk of transmission of prion disease and risk of anaphylaxis in susceptible individuals<sup>6</sup> are main limiting factor in glue method of treatment. Therefore, a new method of adhering graft to recipient site by patient's own blood reduces complications associated with other surgical technique like use of sutures and fibrin glue. There are limited studies in which suture autograft was compared with autologous blood, hence, the present study was undertaken to measure efficacy and post-operative outcome of autologous blood in comparison to sutures.

### Materials and Methods

The present prospective study was conducted at the department of ophthalmology, Narayana medical college and hospital, Nellore from- September 2017 to June 2018.

A total 40 patients with primary nasal pterygium were selected from out-patient department (OPD) for surgical intervention at the department of ophthalmology, Narayana medical college and hospital, Nellore.

Following were inclusion and exclusion criteria.

#### Inclusion Criteria:

1. Encroachment upon visual axis,
2. Causing significant decrease in visual acuity due to astigmatism,
3. Causing recurrent irritation,

4. Cosmetically bothersome to the patient,
5. Patients older than 20 years and younger than 60 years.

**Exclusion Criteria:**

1. Temporal pterygium,
2. Recurrent pterygium,
3. Atrophic pterygium,
4. Pseudo-ptyerygium,
5. Patients on anticoagulants,
6. Patients with pre-existing glaucoma,
7. History of previous ocular surgery or trauma.

The patients were randomly divided into two groups for pterygium excision with autograft using either autologous blood (Group - A, 20 patients) or sutures (Group - B, 20 patients). After surgical intervention eyes were patched for 24 hours in both groups. Topical antibiotic and topical steroids and lubricants were given postoperatively. Follow up visits were done on 1 week, 1 month, and 2 month. Two groups were compared for: graft edema, graft stability, recurrence and suture related complications like granuloma formation, suture abcess, pyogenic granuloma. Graft stability was assessed on day 1 in both groups. Mean duration of surgery was noted in both the groups.

**Results**

Total no of patient in present study were 40, which were randomly divided in two group, 20 patients in autologous blood group, 20 patient in suture group. 15 were Males (37.50%) and 25 were females (62.50%) were randomly distributed in study for pterygium excision via autologous blood (Group A) and suture (Group B).

**Table 1: Distribution according to gender in both the groups**

Group	Male	Female
Group a (with autologous blood)	7(35%)	13(65%)
Group b (with sutures)	8(40%)	12(60%)
Total	15	25

Graft was stable in all cases in suture group where as it was displaced in 2 cases (10%) and Graft edema was there in 8 (40%) cases in autologous blood group as compared to 2 (10%) cases in suture group. There were 2 cases (10%) of suture related granuloma observed with suture group at one week follow up.

**Table 2: Distribution of complications in both the groups including Recurrence**

Complication	Group A (with autologous blood)	Group B (with sutures)
Graft displacement	2(10%)	0
Graft edema	8(40%)	2(10%)
Granuloma	0	2(10%)
Recurrence	0	0

Mean duration of surgery in Autologous Blood Group was 19.4+/-1.25 minutes and in Suture group it was 25.6+/-1.8 minutes.

**Table 3: Mean duration of surgery in both groups**

Group	Mean duration of surgery(min)
Group a (with autologous blood)	19.4
Group b (with sutures)	25.6



**Fig. 1. (a): Preoperative case of pterygium; (b): Post op Left Eye-ptyerygium excision with autograft with autologous blood; (c): Preoperative case of pterygium; (d): Post op Left Eye-ptyerygium excision with autograft with sutures**

## Discussion

Pterygium is a degenerative and proliferative disorder of bulbar conjunctiva and its severe form can cause visual impairment. Several surveys have consistently shown that countries nearer to the equator have higher rate of pterygium because of higher exposure to UV light. Many previous studies suggest that the prevalence of pterygium was higher in male than female gender (Hilgers JH et al<sup>2</sup>). But in present study we have seen higher prevalence of pterygium in female (62.5%). Reason for higher prevalence could be higher cosmetic awareness among women. Study by Lu P et al<sup>7</sup> reported a higher prevalence of pterygium in female than male, which he suggested could be due to Tibetan life style where women had mainly rural and outdoor work. Mackenzie FD et al who reported that there is 4 to 11 times more chances of having pterygium in persons working outdoors, exposed to sun and dust.<sup>8</sup> Most of patients in present study were from in middle age group, (mean age in autologous group; 34.7 years, and in suture group 37.8 years).

Treatment of pterygium always remained a point of discussion in ophthalmic practice whether it is medical or surgical. Medical treatment was changing from time to time in the form of topical NSAIDS, topical steroids, topical drops of lubricants, and injection of anti VEGF agents beneath the head of pterygium. All have partial effect and none of the curative medical regimen is known till now in published literature. Till this moment surgical management remains treatment of choice. But there are problems with surgical treatment also. Bare Sclera Excision alone is associated with recurrence rates of 30% to 70%. With adjunctive measures such as topical Thiotepe, 5-flourouracil, or mitomycin C, the recurrence rate is lowered but is associated with high risk of complications. Conjunctival autografting after pterygium excision is associated with lower recurrence rates (2% to 9%) and relatively few sight threatening complication.<sup>9,10</sup> Different methods of securing graft to scleral bed are in practice now. But securing graft with sutures is most commonly performed procedure. Koranyi and associates<sup>11</sup> were the first to report the use of fibrin glue, risk of transmission of prion disease and risk of anaphylaxis in susceptible individuals<sup>5</sup> are main limiting factor in glue method of treatment. We have used another technique of securing graft to the recipient bed by using patient's own blood as an adhesive. In present study we have compared different postoperative outcomes in patients with who have grafts secured with autologous blood (20 patients) and sutures (20 patients). Graft displacement is a major concern in grafts fixed by patients own blood in immediate post-operative period and most of them occur within 24 to 48 hours of surgery. It is considered that graft usually displaces due to undue rubbing of operated eye due to foreign body sensation. Graft retraction at its bed is also an issue with this technique but appropriately thin graft of adequate size avoids this complication in most of the patients. So care must be taken for thin and appropriate size of graft when performing surgery with autologous blood technique. Proper

counselling of patients for not to rub their eyes avoids complication related to graft displacement. In present study graft was displaced in 2 patients (10%) which were further secured with sutures. Nisha Dulani et al who reported graft displacement in only 3.39% of the patient.<sup>12</sup> Graft edema was noted in 36.66% patients in autologous blood technique and in 44.11% of patients in suture technique which subsided after giving prednisolone acetate drops topically. In study of Celeva Markovaska et al<sup>13</sup> graft edema was present in 22.5% of cases in Suture group. In our study this is greater 40%. Type of pterygium and intraoperative manipulation may be responsible for greater graft edema. At the end of 2 month no recurrence was seen in suture group as well as in autologous blood group. Mean duration of surgery in Autologous Blood Group was  $19.4 \pm 1.25$  minutes and in Suture group was  $25.6 \pm 1.8$  minutes. In study by S.A.M. Elwan et al<sup>14</sup> mean operating time was 24 minutes in Autologous blood group and 28.64 minutes in Suture group.

## Conclusion

Suture related complications remains draw back in suture group and graft displacement remains a problem with autologous blood group. But overall incidences of these complications are very less. Another technique for graft fixation is by use of fibrin glue, but affordability is an issue in our patients, who are mainly field worker and labourers. In developing countries like, India cost effective treatment remains big issue. Fibrin glue being costly is not affordable by most of the poor peoples. So considering cost effectiveness, less postoperative discomfort and no issue of viral disease transmission, pterygium surgery with autologous blood may be a preferable surgical method in treatment of pterygium.

**Conflict of Interest:** None.

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