

**Comparative Study of Post-Operative Outcomes of Pterygium Excision with Autograft using Autologous Blood and Sutures**Shiv Kumar<sup>1</sup>, Md. Imamul Hoda<sup>2</sup>, Talat Nahid<sup>3</sup>, R. K. Singh<sup>4</sup><sup>1</sup>Senior Resident, Department of Ophthalmology, Sri Krishna Medical College & Hospital, Muzaffarpur, Bihar<sup>2</sup>Senior Resident, Department of Ophthalmology, Sri Krishna Medical College & Hospital, Muzaffarpur, Bihar<sup>3</sup>Associate Professor, Department of PSM, GTCH, Patna, Bihar<sup>4</sup>Associate Professor and Head of Department, Department of Ophthalmology, Sri Krishna Medical College & Hospital, Muzaffarpur, Bihar

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**Abstract:**

**Background:** Pterygium is a very common eye disorder that is thought to be caused by aberrant epithelium and fibrovascular tissue growing too much and proliferating onto the cornea. They are distinguished by inflammation, neovascularization, and cell proliferation. The pathophysiology of pterygium is significantly influenced by genetic alterations linked to altered cytokine production and ultraviolet radiation (UVR)-induced elastoid degeneration of subepithelial connective tissue. One of the more successful current therapy modalities is conjunctival autograft. Fibrin glue or sutures are the most often utilized methods for fixing conjunctival autografts. The purpose of this research is to compare the two pterygium surgical treatment modalities in terms of surgical time and postoperative results.

**Methods:** This prospective study was carried out at the ophthalmology department of Sri Krishna Medical College and Hospital in Muzaffarpur, Bihar, between March 2018 and February 2019. For surgical intervention, 40 patients of primary nasal pterygium were chosen from the outpatient department. For pterygium excision with autograft, the patients were split into two groups at random and given either autologous blood (20 patients) or sutures (20 patients). Following the surgical procedure, both groups' eyes were patched for a full day, and the length of the procedure, recurrence, graft edema, graft stability, and other problems were compared between the two groups.

**Results:** After pterygium excision with conjunctival autografting, granuloma was more common in the suture group and graft edema more common in the autologous blood approach.

**Conclusion:** When compared to sutures, autologous blood is a more superior and economical method of fixing the graft during pterygium surgery, without posing additional risks.

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

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**Introduction**

Pterygium is a degenerative disease of the subconjunctival tissue that spreads as vascularized granulation tissue and invades the cornea, damaging the Bowman's membrane and the superficial layers of stroma before the conjunctival epithelium covers the entire area.

Pterygium without symptoms is often misdiagnosed. Mechanical irritation, recurrent inflammation, and tear film instability are the causes of recurring redness and a feeling of a foreign body. In advanced cases, vascularized granulation tissue of aggressive, rapidly developing pterygium may enter the cornea, damaging the superficial layers of stroma and Bowman's

membrane, and encroaches upon pupillary area. Tissue fibrosis can cause changes in the cornea's curvature, which can result in astigmatism and corneal opacity. [1] There is a visual impairment prevalent in these patients. Men are more likely than women to get pterygium. [2]

Males are thought to be more susceptible than females to dust and other environmental irritants. Age-related increases in prevalence were seen. UVR-induced subepithelial connective tissue elastoid degeneration, genetic damage, and the resulting altered expression of cytokines all contribute to the pathophysiology of pterygium. Studies reveal that as compared to normal

conjunctiva, pterygium tissue has newly formed arteries with higher expression of vascular endothelial growth factor (VEGF) (Marcovich, Morad et al. 2002). Aspiotis, Tsanou et al. (2007) and Marcovich, Morad et al. (2002) both suggest that angiogenesis may be involved in pterygium. [3,4] These days, NSAIDs and ocular lubricants are used to treat static pterygium of grades 1 to 2, with the former being used to minimize recurrent inflammation and the latter to treat tear film instability. Surgery is only performed in cases where non-medical treatments are ineffective in alleviating the symptoms and signs of a large pterygium that is pressuring the head and producing astigmatism, diplopia, and visual axis obscuration. Preventing recurrence is the major challenge in pterygium surgery. [5]

Sutures and fibrin glue were the main topics of discussion in a recent debate about the optimal surgical technique for attaching the conjunctival transplant. The former carries a higher risk of discomfort connected to sutures after surgery and calls for skilled surgical performance. Fibrin-based adhesives can be applied beneath a superficial covering layer (such as the conjunctiva or amniotic membrane) without causing inflammation due to their biological and biodegradable characteristics. The primary factors restricting the use of glue as a treatment are the high cost of fibrin glue, the possibility of prion disease transmission, and the possibility of allergy in those who are vulnerable. Thus, a novel strategy for using the patient's own blood to adhere the graft to the recipient site minimizes the risks related to alternative surgical techniques including the use of fibrin glue and sutures. [6] The objective of this study was to evaluate autologous blood's effectiveness and post-operative results in relation to sutures.

### Materials and Methods

From March 2018 to February 2019, the current prospective study was carried out at the

ophthalmology department of Sri Krishna Medical College and Hospital, Muzaffarpur, Bihar.

Forty patients suffering from primary nasal pterygium were chosen for surgical surgery at the SKMCH Muzaffarpur, Bihar, out-patient department of ophthalmology. These patients' encroachment onto the visual axis, severe decrease in visual acuity due to astigmatism, frequent discomfort, and cosmetic bothersomeness to the patient were all included in this study, along with their age group of >20 years <60 years. Individuals with a history of prior ocular surgery or trauma, anticoagulants, pre-existing glaucoma, recurring pterygium, atrophic pterygium, or pseudo-terygium were not allowed to participate in the study.

For pterygium excision with autograft, the patients were split into two groups at random: Group A consisted of 20 patients, while Group B consisted of 20 patients. The autograft procedure used autologous blood or sutures. Both groups' eyes were patched for a full day following the surgical procedure. Following surgery, topical steroids, lubricants, and antibiotics were used.

There were follow-up visits after one week, one month, and two months. Graft edema, stability, recurrence, and problems linked to sutures, such as granuloma development, suture abscess, and pyogenic granuloma, were compared between the two groups. On the first day, graft stability was evaluated for both groups. A note was taken on the average length of surgery for both groups.

### Results

There were 40 patients in total in this trial, 20 of whom were randomly assigned to the autologous blood group and 20 to the suture group. In the study, 25 females (62.50%) and 15 males (37.50%) were assigned at random to receive autologous blood (Group A) or suture (Group B) for pterygium excision.

**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 edema was present in 8 (40%) cases in the autologous blood group compared to 2 (10%) cases in the suture group, whereas the graft was stable in all cases in the suture group and displaced in 2 cases (10%). At a one-week follow-up, two cases (10%) of suture-related granuloma were seen with the suture group.

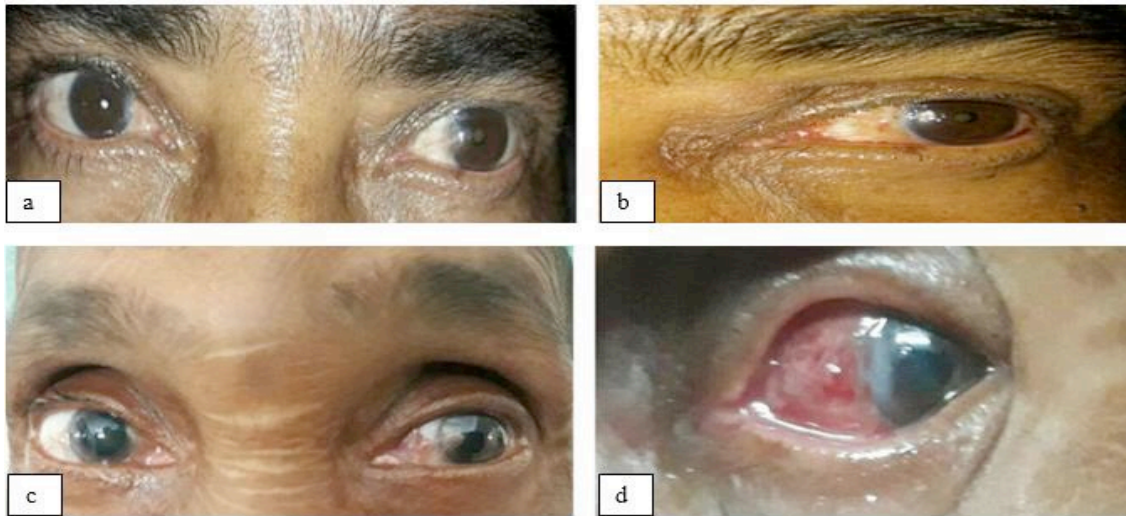
**Table 2: Distribution of complications in both the groups including Recurrence**

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

In the Autologous Blood group, the average surgical time was 19.4±1.25 minutes, while in the 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



**Figure 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

A severe form of pterygium, a degenerative and proliferative condition of the bulbar conjunctiva, can impair vision. Due to increased UV radiation exposure, surveys have repeatedly demonstrated that pterygium is more common in countries closer to the equator. Numerous earlier research indicate that men were more likely than women to have pterygium (Hilgers JH et al). [3] However, the current study shows that females had a higher prevalence of pterygium (62.5%). One explanation for the increased frequency could be women's increased awareness of cosmetics. A study by Lu P et al. [8] found that women had a higher prevalence of pterygium than men did. He proposed that this could be because women in Tibatian culture were mostly employed in rural and outdoor environments. Mackenzie FD et al. found that those who work outside and are exposed to dust and sunlight have a 4–11 times higher risk of developing pterygium. [9] The majority of the patients in this study were middle-aged (34.7 years for the autologous group and 37.8 years for the suture group, on average).

Whether it is surgical or medicinal, the management of pterygium has always been a topic of discussion in ophthalmic practice. Periodically, topical NSAIDs, topical steroids, topical lubricant drops, and injections of anti-VEGF drugs under the pterygium's head were used as medical treatments. All only have a limited impact, and there is currently no recognized curative medicinal regimen

in the literature. Currently, surgical intervention is the preferred course of treatment.

However, there are issues with surgical intervention as well. Recurrence rates after bare scleral excision range from 30% to 70%. The recurrence rate is decreased with adjuvant treatments like topical Thiotepe, 5-fluorouracil, or mitomycin C, but there is a significant risk of consequences. Following pterygium excision, conjunctival autografting is linked to a decreased recurrence rate (2% to 9%) and comparatively fewer sight-threatening complications. [10,11]

There are now several techniques in use for attaching grafts to scleral beds. Suture graft securing is, however, the most often used technique. The use of fibrin glue was initially reported by Koranyi and associates [12]; the primary factors limiting the glue treatment approach are the risk of allergy in vulnerable persons and the potential of prion disease transmission. We have also utilized the patient's own blood as an adhesive to adhere the graft to the recipient bed. In the current study, we evaluated various postoperative outcomes in patients (20 patients) who had autologous blood grafts secured with sutures and 20 patients who had grafts secured with autologous blood.

Graft displacement, which often happens 24 to 48 hours after surgery, is a serious concern in the immediate post-operative period for grafts repaired using the patient's own blood. It is believed that

excessive rubbing of the operated eye as a result of foreign body sensation typically causes graft displacement. Graft retraction at the bed is another problem with this procedure, however in most cases, a suitably thin and large graft prevents this difficulty. Therefore, when using autologous blood in surgery, care must be taken to ensure that the graft is thin and the right size. Adequate patient counseling to refrain from rubbing their eyes prevents complications associated with the displacement of the graft. In the current study, 10% of the patients had graft displacement; these patients had their grafts further sutured. According to Nisha Dulani et al., only 3.39% of the patients had graft displacement. [13]

Graft edema was observed in 44.11% of patients using the suture approach and 36.66% of patients using the autologous blood technique. These patients' graft edemas resolved after receiving topical prednisolone acetate drops. In the Suture group, graft edema was observed in 22.5% of the cases in the Celeva Markovaska et al [13] investigation. In our research, this figure exceeds 40%.

Greater graft edema may be caused by the type of pterygium and intraoperative manipulation. Neither the autologous blood group nor the suture group showed any signs of recurrence after two months. In the Autologous Blood group, the average surgical time was  $19.4 \pm 1.25$  minutes, while in the Suture group, it was  $25.6 \pm 1.8$  minutes. The autologous blood group's mean operating time was 24 minutes, whereas the suture group's was 28.64 minutes in the study by S.A.M. Elwan et al. [15].

### Conclusion

Graft displacement is still an issue with autologous blood groups, and problems linked to sutures continue to be a drawback for suture groups. However, these issues are extremely rare overall. Fibrin glue is another method of graft fixation, but cost is a concern for our patients, who are primarily laborers and field workers.

Cost-effective therapy is still a major problem in underdeveloped nations like India. Due to its high cost, most impoverished individuals cannot purchase fibrin glue. In light of these advantages lower postoperative pain, less risk of viral disease transmission, and cost effectiveness pterygium surgery using autologous blood may be the better surgical approach.

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