

## A Comparative Study of Recurrence Rate of Conjunctival Autograft and Bare Sclera Techniques in the Treatment of Pterygium

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Conflict of interest: Nil

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### Abstract

**Aim:** The aim of the present study was to evaluate bara sclera technique and conjunctival graft in the treatment of pterygium.

**Methods:** Patients presenting to the OPD in Department of Ophthalmology, ANMMCH, Gaya with pterygium from June 2021 to January 2022 were included in our study. The study was carried out on 40 patients. Efforts were made to select patients with primary fleshy pterygium. Patients were divided into two groups, Group I and Group II.

**Results:** 20 eyes included in both the groups with M:F ratio 14:6. In the present study, most of the cases 12 were in 41-50 age group followed by 31-40 and 58-62 age groups (8). In the present study, nasal pterygium were most i.e., 80% followed by both 12.5% and temporal 7.5 %.

**Conclusion:** The recurrence rate of in patients who have undergone pterygium excision with Bare Sclera Technique (40%) in comparison to patients who have undergone pterygium excision along with Conjunctival Autograft. In most of the patient's improvement of visual activity occurred after pterygium surgery. Majority of the patients were outdoor workers 80% as compared to indoor workers. 40% have recurrence rate in group I and 10% in recurrence rate in group II.

**Keywords:** Pterygium, Bara Sclera Technique, Excision.

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### Introduction:

Pterygium is defined as the non-cancerous, wing shaped growth of the conjunctiva encroaching upon the cornea from either side within the interpalpebral fissure. It is a common external eye disease affecting different populations especially in tropical and sub-tropical regions. It is commonly seen those patients who have been living in hot climate and may represent a response to chronic dryness and ultraviolet

exposure. In a population-based study from rural central India, prevalence of pterygium increased from 6.7±0.8% in the age group from 30–39 years to 25.3±2.1% in the age group of 70–79 years. Three population-based studies have described the incidence of pterygium. Barbados eye study has described the nine-year incidence of pterygium to be 11.6% (95% CI, 10.1–13.1), the Beijing Eye Study described the 10-year incidence of

pterygium in the adult Chinese population to be 4.9%, and the five year cumulative incidence in Bai Chinese population in a rural community was 6.8% (95% CI, 5.2–8.4). [1-3]

These population-based studies suggest that cumulative ultraviolet light exposure due to outdoor occupation is a major risk factor for the development of pterygium. Other factors associated with pterygium development are age, being male and having dry eyes. [4] Genetic factors, tumor suppressor gene p53 and other genes may be involved in the pathogenesis of pterygium. [5]

Usually, it is benign but can cause astigmatism [6] and visual problems if it extends onto the cornea and obscures the visual axis. Various aetiologies have been attributed to its cause, but mainly the ultraviolet rays are the common and important cause for the occurrence of pterygium. [7] The present widely accepted treatment for pterygium is pterygium excision with conjunctival autograft, [8] though various other approaches like the bare sclera technique, [9] sliding conjunctival graft, [10] amniotic membrane graft [11] has been done. Adjuvants like Mitomycin C, [12] beta-irradiation, [13] 5-fluorouracil, [14] have been used along with pterygium excision to reduce the recurrences.

In general, conservative therapy for pterygium is warranted unless one of the following circumstances arises: loss of visual acuity either because of induced astigmatism or encroachment onto the visual axis, marked cosmetic deformity, marked discomfort and irritation unrelieved by medical management, limitation of ocular motility secondary to restriction, or documented progressive growth toward the visual axis so that ultimate loss of vision can reasonably be assumed. In such circumstances, surgical

intervention is required. Because recurrences after pterygia excision are frequent and aggressive, firm indications for surgical removal should exist before primary excision. The fact that numerous different techniques exist for the surgical treatment of pterygium underscores the point that no single approach is universally successful.

The aim of the present study was to evaluate bare sclera technique and conjunctival graft in the treatment of pterygium.

### Materials and Methods

Patients presenting to the OPD in the Department of Ophthalmology, ANMMCH, Gaya with pterygium from June 2021 to January 2022 were included in our study. The study was carried out on 40 patients. Efforts were made to select patients with primary fleshy pterygium. Patients were divided into two groups, Group I and Group II.

**Group I:** 20 patients were selected randomly with primary pterygium. The pterygium was excised with bare sclera technique.

**Group II:** 20 patients were selected with primary pterygium. The Pterygium was excised with Bare Sclera Technique. Conjunctival autograph was taken from superior bulbar conjunctiva and was placed on the scleral bed and sutured with 8-0 vicryl in interrupted manner.

### Result and Observation

Group I: 20 patients of pterygium were excised with bare sclera technique and each patient was followed up at regular interval of 1<sup>st</sup> and 4<sup>th</sup> Week.

Group II 20 patients of pterygium were excised with bare sclera technique and after that conjunctival autografting was done

**Table 1: Age and Sex of Patients**

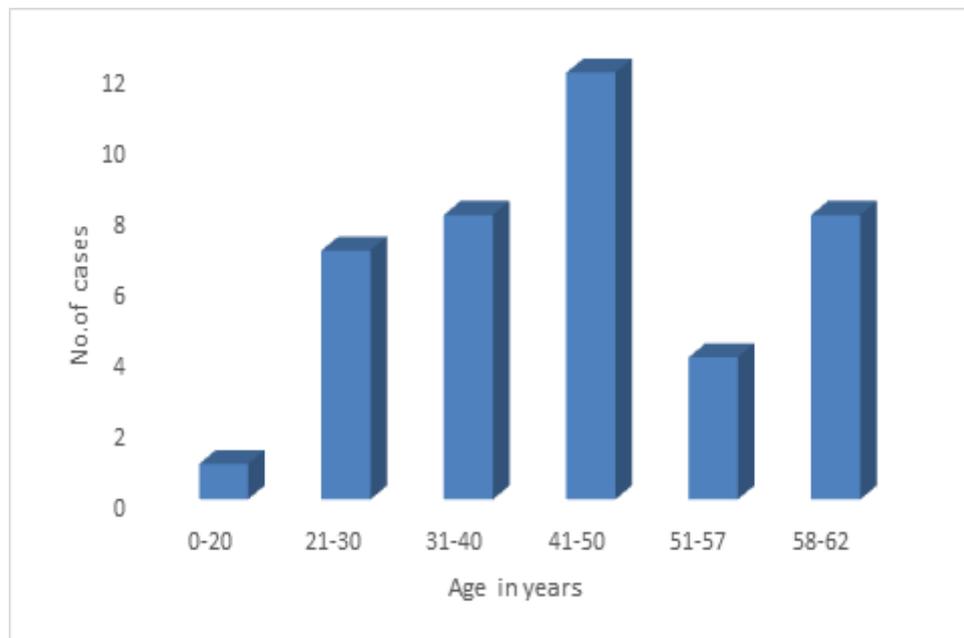
Treatment Group	No. of Eyes	Average age (in years)	Gender Ratio (M: F)
Group I	20	39.12 (24-62)	14:6
Group II	20	39.12 (24.62)	14:6

20 eyes included in both the groups with M:F ratio 14:6.

**Table 2: Incidence according to age of distribution**

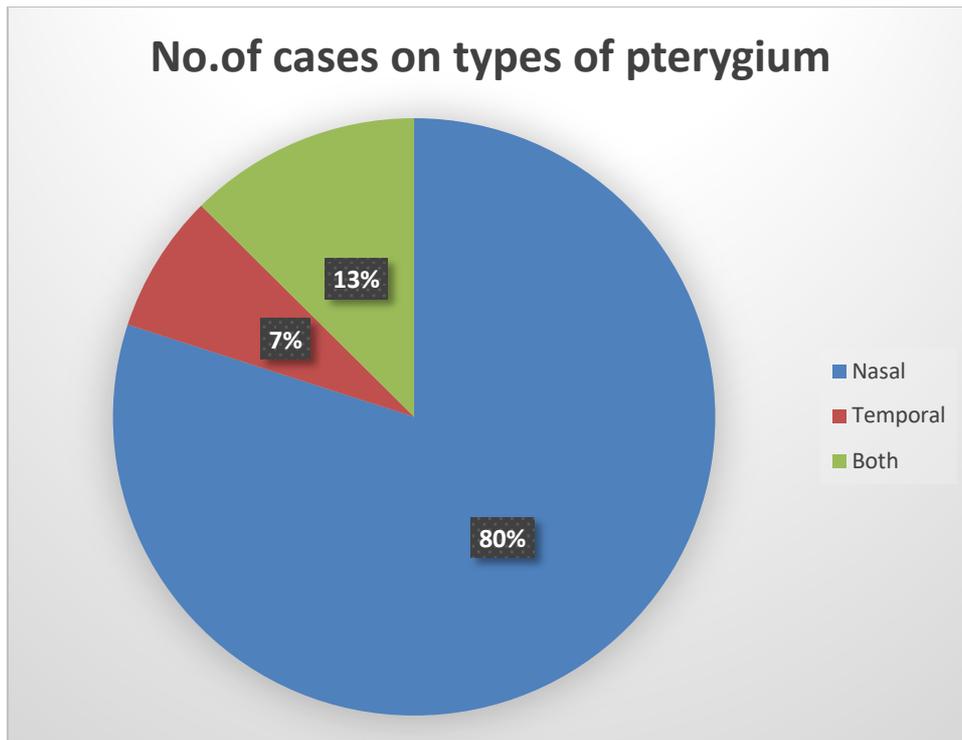
Age Interval	No. of cases
0-20	1
21-30	7
31-40	8
41-50	12
51-57	4
58-62	8

In the present study, most of the cases 12 were in 41-50 age group followed by 31-40 and 58-62 age groups (8).

**Table 3: Incidence according to type of pterygium in Group I and II**

Type of Pterygium	No. of cases	Percentage (%)
Nasal	32	80
Temporal	3	7.5
Both	5	12.5

In the present study, nasal pterygium were most i.e., 80% followed by both 12.5% and temporal 7.5 %.



**Table 4: Occupational Relationship**

Occupation	No. of cases	Percentage (%)
Outdoor worker	32	80
Indoor Worker	8	20

Majority of the patients were outdoor workers 80% as compared to indoor workers.

**Table 5: Recurrence Rate in Study Group**

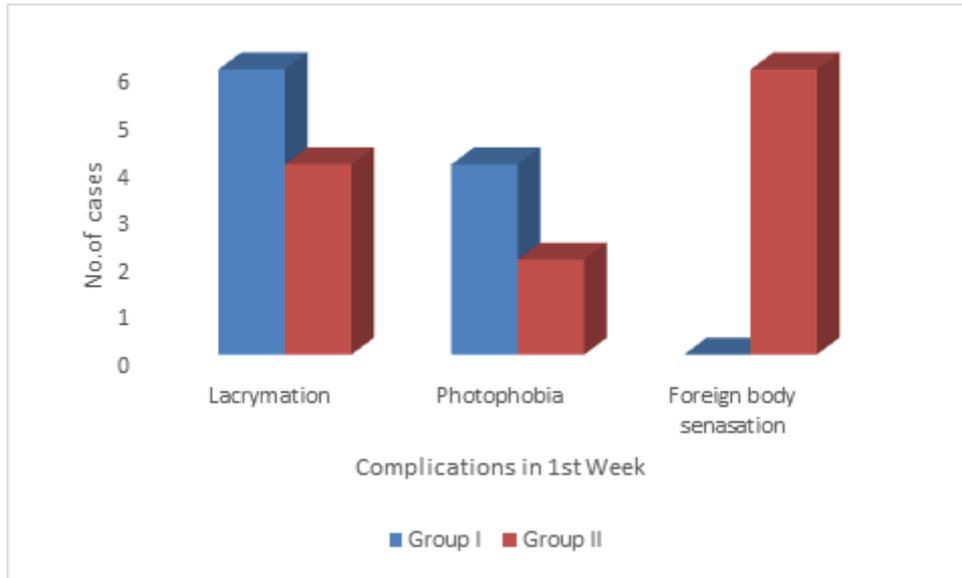
Treatment Group	No. of eyes	No. of eyes with recurrence	Recurrence rate
Group I	20	8	40%
Group II	20	2	10%

40% have recurrence rate in group I and 10% in recurrence rate in group II.

**Table 6: Post-Operative Complication (1<sup>st</sup> Week)**

Complication	Group I	Group II
Lacrymation	6	4
Photophobia	4	2
Foreign body sensation	0	6

After first week, post-operative complications were lacrymation and foreign body sensation in group I and lacrymation and photophobia in group II.



**Table 7: Post-operative complication**

Group I	Chemosis (4 patients) Subtenon granuloma (1 patient)
Group II	Graft edema(1Patient) Graft retraction (1 patient) Subtenon granuloma (1 patient) Vascularization of graft(5 patients)

Post-operatively in group I chemosis was seen in 4 patients, and in group II, Vascularization of graft was seen in 5 patients.

**Discussion**

Pterygium excision with conjunctival autograft is a widely performed surgery for pterygium. The complications that have been noted include intra-operative complications like perforation of the globe, thinning of sclera or cornea from dissection, intraoperative bleeding, muscle injury, buttonholing, graft tear. Early postoperative complications like dellen, Haematoma beneath the graft/subconjunctival hemorrhage, graft edema, graft retraction/loss of graft, granuloma. Late postoperative complications include recurrence, corneoscleral necrosis, scleritis, endophthalmitis. [15]

Pterygium is a common ophthalmic condition seen mostly in dry, dusty areas. Various surgical options are available to

manage this condition with prevention of recurrence as the primary aim. It is still an ongoing debate regarding the “ideal” pterygium surgery. [16] Use of a conjunctival graft to cover the bare sclera after excision of pterygium has been reported to be the most effective method of lowering recurrence rate (2%–9%) and complications. [8,17,18] The transplantation of conjunctiva-limbal autograft helps cover the limbal stem cell deficiency. [19] Care should be taken to include the limbal part while harvesting the graft so that stem cells are included. [18]

Although autologous limbal conjunctival grafting is an effective method for prevention of recurrence after pterygium surgery, suturing of the autograft is difficult and necessitates surgical experience and technical skill. [20] Furthermore, sutures may cause patient discomfort, symblepharon, or graft rupture. [21] Biological tissue glue, such as fibrin glue, has come as a novel

alternative for securing the graft as it causes less complications and postoperative discomfort. Fibrin glue has been used in ophthalmology for conjunctival wound closure, oculoplastic or orbital surgery, filtering bleb dehiscence, lamellar keratoplasty, and amniotic membrane transplantation. [22] Ti et al. [23] showed that postoperative inflammation increases the risk of pterygium recurrence. Suzuki et al. [24] reported that silk or nylon sutures may cause conjunctival inflammation and Langerhans cell migration into the cornea.

Koranyi et al. [21] compared 7/0 vicryl suture to fibrin glue in their study. They assessed postoperative patient complaints and operation time. They found that patient discomfort was less and operation time was shorter in fibrin glue group. In addition, they reported that the cost of one fibrin glue was equal to cost of five sutures and one fibrin glue can be used for 6–7 patients, making overall cost of surgery same for both the Group. We also had similar results and interpretation of cost–benefit analysis. The use of fibrin glue was associated with markedly reduced surgical time. Uy et al. also showed similar statistically significant reduction in mean operative time. [25] Postoperative pain was less in fibrin glue than those with suture group. Furthermore, in our study, pain lasted for less duration than those with suture group. Foreign body sensation present in most of the patients on 1st postoperative day may be due to superficial keratectomy done during surgery. However, on subsequent days, patient in fibrin glue group was more comfortable than those in suture group. These observations are comparable to other studies evaluating these parameters. [26]

Attaching conjunctival autograft using autologous blood is a new approach, also known as “suture and glue free autologous graft.” This procedure has excellent results without any complications associated with

sutures and glue. In Mitra et al.'s study – a prospective, noncomparative, interventional case series conducted in India – 19 patients underwent graft fixation with autologous blood. [27,28]

### Conclusion

The recurrence rate of in patients who have undergone pterygium excision with Bare Sclera Technique (40%) in comparison to patients who have undergone pterygium excision along with Conjunctival Autograft. In most of the patient's improvement of visual activity occurred after pterygium surgery.

### References

1. Nemesure B, Wu SY, Hennis A, Leske MC; Barbados Eye Studies Group. Nine-year incidence and risk factors for pterygium in the barbados eye studies. *Ophthalmology*. 2008 Dec; 115(12):2153-8.
2. Zhao L, You QS, Xu L, Ma K, Wang YX, Yang H, Jonas JB. 10-year incidence and associations of pterygium in adult Chinese: the Beijing Eye Study. *Invest Ophthalmol Vis Sci*. 2013 Feb 27;54(2):1509-14.
3. Li L, Zhong H, Tian E, Yu M, Yuan Y, Yang W, Wei T, Cha X, Li X, Li J, Su X, Pan CW. Five-Year Incidence and Predictors for Pterygium in a Rural Community in China: The Yunnan Minority Eye Study. *Cornea*. 2015 Dec; 34(12):1564-8.
4. Wong TY, Foster PJ, Johnson GJ, Seah SK, Tan DT. The prevalence and risk factors for pterygium in an adult Chinese population in Singapore: The Tanjong Pagar survey. *American journal of ophthalmology*. 2001 Feb 1; 131(2):176-83.
5. Liu T, Liu Y, Xie L, He X, Bai J. Progress in the pathogenesis of pterygium. *Current Eye Research*. 2013 Dec 1;38(12):1191-7.
6. Avisar R, Loya N, Yassur Y, Weinberger D. Pterygium-induced

- corneal astigmatism. *Isr Med Assoc J*. 2000 Jan;2(1):14-5.
7. Moran DJ, Hollows FC. Pterygium and ultraviolet radiation: a positive correlation. *Br J Ophthalmol*. 1984 May; 68(5):343-6.
  8. Kenyon KR, Wagoner MD, Hettinger ME. Conjunctival autograft transplantation for advanced and recurrent pterygium. *Ophthalmology*. 1985 Nov;92(11):1461-70.
  9. D'Ombra A The surgical treatment of pterygium *Br J Ophthalmol* 1948 32 65 71.
  10. Tomas T Sliding flap of conjunctival limbus to prevent recurrence of pterygium *Journal of Refractive Surgery*. 1992 8 394 5.
  11. Ma DH, See LC, Liao SB, Tsai RJ. Amniotic membrane graft for primary pterygium: comparison with conjunctival autograft and topical mitomycin C treatment. *Br J Ophthalmol*. 2000 Sep;84(9):973-8.
  12. Waziri-Erameh MJ, Ukponwan KU Evaluation of the effectiveness of intraoperative mitomycin C in pterygium surgery for African eyes *Sahel Med J* 2007 10 132 6.
  13. Alaniz-Camino F. The use of postoperative beta radiation in the treatment of pterygia. *Ophthalmic Surg*. 1982 Dec;13(12):1022-5.
  14. Bekibele CO, Baiyerolu AM, Olusanya BA, Ashaye AO, Oluleye TS Pterygium treatment using 5FU as adjuvant treatment compared to conjunctiva autograft *Eye (Lond)* 2008 2231 4.
  15. Hall AB. Understanding and managing pterygium. *Community Eye Health*. 2016;29(95):54-56.
  16. Romano V, Cruciani M, Conti L, Fontana L. Fibrin glue versus sutures for conjunctival autografting in primary pterygium surgery. *Cochrane Database Syst Rev*. 2016 Dec 2;12(12): CD011308.
  17. Spaeth EB. Rotational island graft for pterygium. *Am J Ophthalmol*. 1926;9: 649-55.
  18. Lewallen S. A randomized trial of conjunctival autografting for pterygium in the tropics. *Ophthalmology*. 1989 Nov 1;96(11): 1612-4.
  19. Coroneo MT, Di Girolamo N, Wakefield D. The pathogenesis of pterygia. *Current opinion in ophthalmology*. 1999 Aug 1;10(4):28 2-8.
  20. Yüksel B, Ünsal SK, Onat S. Comparison of fibrin glue and suture technique in pterygium surgery performed with limbal autograft. *International journal of ophthalmology*. 2010;3(4):316.
  21. Koranyi G, Seregard S, Kopp ED. Cut and paste: A no suture, small incision approach to pterygium surgery. *Br J Ophthalmol*. 2004; 88:911-4.
  22. Panda A, Kumar S, Kumar A, Bansal R, Bhartiya S. Fibrin glue in ophthalmology. *Indian J Ophthalmol*. 2009; 57:371-9.
  23. Ti SE, Chee SP, Dear KB, Tan DT. Analysis of variation in success rates in conjunctival autografting for primary and recurrent pterygium. *British journal of ophthalmology*. 2000 Apr 1;84(4):385-9.
  24. Suzuki T, Sano Y, Kinoshita S. Conjunctival inflammation induces Langerhans cell migration into the cornea. *Current eye research*. 2000 Jan 1;21(1):550-3.
  25. Uy HS, Reyes JM, Flores JD, Lim-Bon-Siong R. Comparison of fibrin glue and sutures for attaching conjunctival autografts after pterygium excision. *Ophthalmology*. 2005 Apr 1; 112 x(4):667-71.
  26. Sarnicola V, Vannozzi L, Motolese PA. Recurrence rate using fibrin glue-assisted ipsilateral conjunctival autograft in pterygium surgery: 2-year follow-up. *Cornea*. 2010; 29:1211-4.

27. Mitra S. Autoblood as tissue adhesive for conjunctival autograft fixation in pterygium surgery. *External Diseases Free Papers*. 2011 Oct 22:562.
28. Restrepo L. E. D. L. P., Ávila J. L. B., Moreno K. S. H., Noriega L. G. E., Castellan Ángela M. A., & Pérez F. A. T. Pelvic Ring Fracture as a Potential Risk of Death in Politraumatic Patients. *Journal of Medical Research and Health Sciences*. 2021;4(9): 1446–1450.