



**ORIGINAL RESEARCH PAPER**

**Ophthalmology**

**A COMPARATIVE STUDY OF DIFFERENT TYPES OF PTERYGIUM SURGERIES**

**KEY WORDS:** Conjunctival limbal autograft (CLAG), Fibrin glue, Pterygium.

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**ABSTRACT**

This study was done to evaluate the most effective technique in the management of pterygium. 100 cases with primary nasal pterygium were divided into 4 groups (25 patients in each group). Group I- treated by the pterygium excision-bare sclera technique. Group II treated by the pterygium excision with CLAG-Suture. Group III treated by pterygium excision with CLAG- cut and paste technique (without using suture and glue). Group IV treated by pterygium excision with CLAG- fibrin glue. Pterygium surgeries were evaluated in terms of complications, time taken for surgery and recurrence. The recurrence rate was highest (36%) in the group without transplantation. The pterygium excision with CLAG- cut and paste technique are highly efficient in terms of low recurrence rates, high level of patient comfort, minimum surgery time and cost effectiveness.

**INTRODUCTION:**

Pterygium is a wing-shaped growth of fibrovascular tissue of the sub-conjunctiva which invades the cornea from either side nasal or temporal, usually on the nasal side. The plural form of the word is pterygia. Pterygia are benign (non-cancerous) growth; it can destroy superficial layers of stroma and Bowman's membrane causing astigmatism and higher-order aberrations that affect vision. Pathologically pterygium is a degenerative condition of conjunctiva. Although ultraviolet radiations from the sun appears to be the primary cause for the development and growth of pterygia, dust and wind are sometimes implicated too as it is a dry eye disease.<sup>1</sup> Pterygia usually develop in 30 to 50 year olds and is more common in elderly males. It may be unilateral or bilateral. Other factors associated with pterygium development are genetic factors, tumor suppressor gene p53 and other genes may be involved in the pathogenesis of pterygium. A study indicated a two-stage hypothesis for pterygium pathogenesis: initial disruption of the limbal barrier and progressive active 'conjunctivalisation' of the cornea<sup>1</sup>.

The main indication of pterygium surgery is visual disturbance secondary to encroachment over the pupillary area or induced astigmatism and cosmetic concerns<sup>2</sup>.

Surgery is the mainstay of treatment for pterygium causing visual disturbances. The primary complication of pterygium surgery is recurrence, defined by re-growth of fibrovascular tissue across the limbus and onto the cornea.

**AIMS & OBJECTIVE:**

- To evaluate the most effective technique in the management of pterygium, in terms of recurrence rate.
- To analyze intra-operative and post-operative complications in various pterygium surgeries.
- To assess time taken in different types of pterygium surgeries and cost effectiveness.

**MATERIAL & METHODS:**

100 cases with primary nasal pterygium (pterygium length over the cornea 1.0 mm or more) age 30 to 80 years, who presented to the OPD of our hospital "Amaltas institute of medical sciences" Bangar, Dewas, M.P., from March 2018 to October 2019 were included in this prospective interventional study. The study was approved by the Institutional Ethical committee. Outcomes were evaluated in terms of complication and recurrence after pterygium excision. Mean follow-up time after surgery was 10.5 month (6-15 month). The patients were divided into 4 groups: Group I of 25 patients with primary pterygium treated by the pterygium excision - bare sclera technique. Group II of 25 patients treated by the pterygium excision with CLAG - suture. Group III of 25 patients were treated by pterygium

excision with CLAG - cut and paste technique without using suture and glue. Group IV of 25 patients were treated by pterygium excision with CLAG - fibrin glue.

All Pre operative investigations, postoperative evaluations and surgical procedure were performed by single ophthalmologist. Cases with recurrent pterygium and hypersensitivity to human blood products were excluded. Written informed consent was obtained from all patients after explaining the prognosis about recurrence of the pterygium and other complications.

**Surgical steps:**

**Anesthesia:** Peribulbar anesthesia (combination of 2% lignocain and 0.5 % bupivacain) was preferred over topical or subconjunctival to avoid pain during operation and to have smooth surgical procedure, followed by cleaning and sterile draping.

**Pterygium excision:** Pterygium body was excised carefully with conjunctival scissors and the head of pterygium was removed from cornea by using a Bard Parker blade. Tenons and subtenons removed carefully as much as possible.

**Conjunctival limbal autograft preparation:**

The conjunctival defect created by pterygium excision should be measured with a caliper and the superior bulbar conjunctiva should be marked by a marker. A subconjunctival injection of normal saline, around 2ml is injected on the superior bulbar conjunctiva to create the conjunctival balloon. A thin layer of conjunctival graft, devoid of tenons and subtenons tissue was prepared.

**Conjunctival grafting:** The thin conjunctival graft is placed with correct orientation on the area of conjunctival defect created by pterygium excision. The marker helps to identify the correct orientation of the graft. The graft sutured with the 8/0 Vicryl or 10/0 Nylon sutures in group II patients. The graft glued with Fibrin glue in group IV patients. The glue was prepared by mixing of the component properly as per the directions.

And in group III patients we applied the 'cut and paste' technique without using suture and glue. For this technique the recipient bed is encouraged to achieve natural haemostasis and relative desiccation before graft placement. Excessive hemorrhage in the graft bed is mopped. Graft adherence and positioning is examined 5-8 min after surgery. The surgery time was noted from the first incision until the lid speculum was removed. The mean surgical time was least for Group III (CLAG-cut and paste no suture no glue technique) followed by Group IV (Fibrin glue) and maximum for Group I. At the end of surgery subconjunctival injection of antibiotic-

steroid was given and sterile eye pad was applied. Postoperatively, subjects in all the groups were treated with antibiotic – steroid combination eye drop four times in a day for a week which was then tapered over a period of next two weeks and with lubricating eye drops, four times in a day. All patients were seen on day 1, day 3, day 7 and, 1 month, 3 months, 6 months, 12 month and 15 month post operatively. Patients were evaluated regarding the presence of pain, foreign body sensations, tearing, and discomfort. During each post operative visit, the status of the autograft and development of possible complications were noted. At the visit of 6 month, the presence of recurrence if, was noted.

**DISCUSSION:**

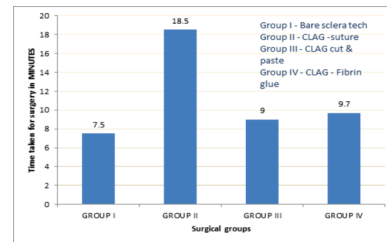
Various surgical options are available to manage Pterygium with prevention of recurrence as the primary aim. Bare sclera technique, which is widely used in developing countries, is associated with high recurrence rate. Currently, most effective used procedure is pterygium excision with conjunctival limbal autograft and is associated with low recurrence rate. Various methods such as sutures, fibrin glue, autologous serum and electrocautery have been used for conjunctival auto grafting. Use of a conjunctival limbal autograft 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. The transplantation of conjunctiva-limbal autograft helps cover the limbal stem cell deficiency. Care should be taken to include the limbal part while harvesting the graft. Suturing of the autograft is difficult and necessitates surgical experience and technical skill. Furthermore, sutures may cause patient discomfort, granuloma formation, graft rupture.<sup>3</sup> 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. Ti *et al.*<sup>4</sup> showed that postoperative inflammation increases the risk of pterygium recurrence. Suzuki *et al.*<sup>5</sup> reported that silk or nylon sutures may cause conjunctival inflammation and Langerhans cell migration into the cornea. Koranyi *et al.*<sup>6</sup> compared 7/0 vicryl suture to fibrin

glue in their study. 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. The use of fibrin glue was associated with markedly reduced surgical time. Uy *et al.*<sup>7</sup> also showed similar statistically significant reduction in mean operative time. 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.

Attaching conjunctival autograft cut and paste technique without using suture and glue 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. The surgical time was also significantly shorter in no glue no suture technique as compared with suture technique, no grafts were lost, and the recurrence rate (4%) is reported with this technique in this study. Rathi *et al.*<sup>8</sup> reported in their study of 50 cases, recurrence in one eye (2%) and graft loss in 1 case (2%). The cost of surgery is another very important factor to be considered. The cost of fibrin glue is quite high. Thus, the material cost of the no suture, no glue method became significantly lower than that of the sutures or using fibrin glue.

**OBSERVATION AND RESULTS:**

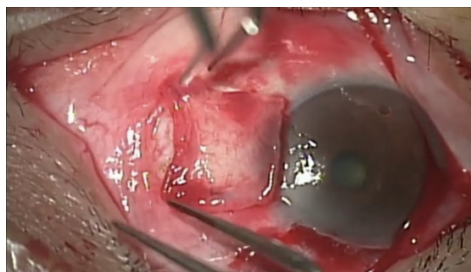
**GRAPH 1**



**TABLE 1 POST OPERATIVE EVALUATION**

	Group I				Group II				Group III				Group IV			
	day 1	day7	1 mth	6-15 mth	day 1	day 7	1 mth	6-15 mth	day 1	day 7	1 mth	6-15 mth	day 1	day7	1 mth	6-15 mth
FB sensation	++	+	-	-	++	++	+	-	+	-	-	-	+	-	-	-
Watering	++	+	-	-	++	++	-	-	+	-	-	-	+	-	-	-
Graft Lost	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Recurrence	-	-	-	9 cases (36%)	-	-	-	4 cases (8%)	-	-	-	1 case (4%)	-	-	-	1 case (4%)

**PICTURE 1**



**Pterygium excision – CLAG cut & paste technique without using suture and glue.**

**CONCLUSION:**

A comparison of the groups demonstrated that the recurrence rate was highest in the group without transplantation. Conjunctival suture is not only time consuming process but also may lead to complications such as discomfort, scarring, granuloma and infection. Plasma derived product such as fibrin glue may produce possible hypersensitivity reaction, whereas the risk of viral transmission remain theoretically possible. The present study confirmed that successful surgical excision of pterygium with conjunctival limbal

autograft cut and paste technique without using glue and suture is the 'gold standard' procedure results in significantly less post- operative complications and shorten the surgery time, it is highly cost effective and provides visual and cosmetic improvement with the lowest recurrence rate.

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