

## A Retrospective Analysis of the Complication Profile after Pterygium Excision, in Primary and Recurrent Pterygia

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### Abstract

**Aim:** To analyze complication profile after pterygium excision, in primary and recurrent pterygia.

**Material & Method:** The patients who had undergone pterygium excision in the Department of Ophthalmology, Darbhanga Medical College & Hospital, Laheriasarai, Darbhanga, Bihar, India, were retrospectively analyzed for complications after surgery over a period of 3 years. A total of 564 eyes in 500 patients were included in the study.

**Results:** Out of total 500 patients presented with pterygium; 382 patients had primary pterygium (276 eyes had single head pterygium, 106 cases had double head pterygium), 118 cases had recurrent pterygium. 442 patients had unilateral pterygium; 58 patients had bilateral pterygium. Out of 500 patients, 185 patients were males and 315 patients were females. Graft edema was seen in 191 cases (50.0%) of primary pterygium and in 23 cases (19.5%) of recurrent pterygium, with a significant *P* value ( $P = 0.0621$ ). Recurrence was noted in 16 (4.2%) of primary pterygium cases and in 5 cases (4.2%) of recurrent pterygium, and the *P* value was significant ( $P = 0.0377$ ). Dellen was seen in 10 cases (2.6%) of primary pterygium and 4 cases (3.40%) of recurrent pterygium, without a significant *P* value ( $P = 0.483$ ).

**Conclusion:** As noted here, a variety of problems might arise following pterygium surgery. Choosing the right method for a certain kind of pterygium and using the right graft fixation technique can result in a better outcome with fewer problems.

**Key words:** Complications, conjunctival autograft, conjunctival limbal autograft, pterygium

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### Introduction

A pterygium is a wing-shaped growth of fibrovascular conjunctiva onto the cornea. Its incidence varies across geographical locations. Several hypotheses have been ascribed to its aetiology. [1] Currently, it is believed that the pterygium is a growth disorder characterized by conjunctivalisation of the cornea due to localized ultraviolet induced damage to the limbal stem cells. [2] Aggressive pterygial fibroblasts are also responsible for corneal invasiveness. [3] The indications for surgery include reduced vision due to encroachment of the visual axis and irregular astigmatism, [4] chronic irritation and recurrent inflammation, restriction of ocular motility, and cosmesis. Numerous surgical techniques including bare sclera excision with or without the use of adjuncts like beta irradiation, thiotepa eye drops, intra- or postoperative mitomycin C (MMC) or

antineoplastic agents, amniotic membrane transplantation, conjunctival autograft (CAG) with or without limbal stem cells have been described. [5]

Although ocular lubrication is required in the presence of symptoms (irritation, red and dry eye), surgery is indeed necessary when the visual axis is covered or the ocular movement restricted. Another indication for pterygium surgery is cosmetic disturbance. The main complication of pterygium surgery is recurrence, which can be up to 89% according to the different surgical techniques. [6] Pterygium excision with conjunctival auto grafting is currently the gold standard technique, which provides the lowest recurrence rate, between 3.3% and 16.7%. [6-9] Low compliance with postoperative treatment has been associated with a higher risk of recurrence. [10]

The present widely accepted treatment for pterygium is pterygium excision with conjunctival auto-graft, [11,12] though various other approaches like the bare sclera technique, [13] sliding conjunctival graft, [14] amniotic membrane graft [15] has been done. Adjuvants like Mitomycin C, [16] beta-irradiation, [17] 5-fluorouracil, [18] have been used along with pterygium excision to reduce the recurrences.

Therefore, this study aims to analyze the complications post pterygium, both immediate and long term for a better understanding of the complication profile.

#### Material & Method:

The patients who had undergone pterygium excision in the Department of Ophthalmology, Darbhanga Medical College & Hospital, Laheriasarai, Darbhanga, Bihar, India, were retrospectively analyzed for complications after surgery over a period of 3 years.

A total of 564 eyes in 500 patients were included in the study. Patients who had undergone (a) Conjunctival auto grafting for primary pterygium (CAG) (b) Conjunctival Limbal auto grafting for recurrent pterygium (CLAG), (c) Vertical split conjunctival auto grafting (VsCAG) for double head pterygium (primary) were included in the study.

Preoperative data collection included age, sex, visual acuity, ocular examination, surgical history. Postoperatively, type of procedure, visual acuity, complications, duration of follow up was noted. Based on the involvement of pterygium over the cornea they were graded (Grade 1: crossing limbus; Grade 2: midway between limbus and pupil; Grade 3: reaching up to pupillary margin; and Grade 4: crossing pupillary margin. All the surgeries were performed by a single surgeon. Based on the type of pterygium different type of surgical procedure was performed as mentioned above.

All surgeries were done under topical anesthesia with local infiltration. 0.5% proparacaine HCl (Aurocaine, Aurolab, India) was used as topical anesthesia. For patients having double head pterygium, 0.5% proparacaine HCL (Aurocaine, Aulabs, India) was used as topical anesthesia. About 1 cc of 2% Xylocaine (AstraZeneca, UK) was injected into the head of nasal pterygium. The head

of the nasal pterygium was avulsed and the body of the pterygium was excised, the residual tissue over the cornea was scraped and smoothed with a crescent blade. Similarly, the temporal pterygium was excised. Hemostasis was achieved with the use of wet field cautery. The conjunctival graft was taken from the superior conjunctiva. Balanced salt solution was injected subconjunctivally with 26-G needle, for easy dissection of the conjunctival graft. A small nick was given using vannas scissor near the forniceal end and a large graft was dissected from the underlying tenons till the limbus. The graft was then vertically split into two halves. The nasal half was released from its base and placed over the nasal bare sclera without changing the orientation. The temporal half of the graft was placed on the temporal bare sclera. The graft was secured on both sides with fibrin glue, Tisseel VH (Baxter AG, Vienna, Austria) ensuring complete coverage of the bare sclera on both sides.

Post-operatively, all the patients were started on topical antibiotics (0.5% Moxifloxacin), 4 times/day for 2 weeks, topical steroids (0.5% Loteprednol etabonate) 6 times/day for the first week and then tapered gradually, and preservative-free tear substitutes (0.5% carboxymethyl cellulose) for 6 weeks. The patients were followed at day 1, 2 weeks, 6 weeks, 6 months initially after the surgery, then every 6 months thereafter. All the complications were noted during the follow-up period. The recurrence was defined as fibrovascular tissue growth of 1.5 mm or more beyond the limbus onto the clear cornea with conjunctival dragging. The study was approved by the institutional ethics committee and adhered to the tenets of the Declaration of Helsinki.

#### Results:

Total of **1000?** 500 patients were included in the study, and these patients were retrospectively analyzed. 382 patients had primary pterygium (276 eyes had single head pterygium, 106 cases had double-head pterygium), 118 cases had recurrent pterygium. 442 patients had unilateral pterygium; 58 patients had bilateral pterygium. Out of 500 patients, 185 patients were males and 315 patients were females. The follow-up period ranged from 6 months to **70?** 30months, with an average of 16 months. Patients with less than 6 months of follow-up were excluded from the study. [Table 1]

**Table 1: Demographic data of the study and follow up period**

Heading	Number
Number of patients	500
Total of pterygium cases	<b>564?</b> 558( 442 unilateral, 58bilateral means 116)
Unilateral: Bilateral	442:58
Primary pterygium (single head+double head pterygia)	382 (276+106)
Recurrent pterygium	118
Male: Female	185:315

Mean age	44.61±13.44
Mean follow up period	15.20±6.30

**Table 2: List of complications post pterygium with their respective percentage in brackets and comparison of complications between primary and recurrent pterygia with their P value**

Post-operative complications	Total no of cases (n=500)	%	Primary pterygium n=382 (%)	%	Recurrent pterygium n=118	%	P
SCH	422	84.4	311	81.4	111	94.1	<0.001
Edema	214	42.8	191	50.0	23	19.5	0.0621
Graft loss	14	2.8	10	2.6	4	3.4	0.0691
Graft retraction	322	64.4	267	69.9	55	46.6	0.598
Sliding of the graft	6	1.2	3	0.8	3	2.5	0.0173
Granuloma	3	0.6	2	0.5	1	0.8	0.662
Host site	3	0.6	1	0.3	2	1.7	0.791
Donor site	21	4.2	16	4.2	5	4.2	0.0377
Recurrence	1	0.2	-	-	1	0.8	-
Corneal melt	0	0	-	-	-	-	-
Scleral perforation	14	2.8	10	2.6	4	3.4	0.483
Dellen							

Complications between primary and recurrent pterygia were compared [Table 2]. Chi-square test was used to compare the categorical outcomes, and a  $P$  value  $<0.05$  was considered statistically significant. Sub conjunctival hemorrhage was seen in 311 cases (81.4%) in primary pterygium and 111 cases (94.1%) of recurrent pterygium with a significant  $P < 0.001$ . Graft edema was seen in 191 cases (50.0%) of primary pterygium and in 23 cases (19.5%) of recurrent pterygium, with a significant  $P$  value ( $P = 0.0621$ ). Recurrence was noted in 16 (4.2%) of primary pterygium cases and in 5 cases (4.2%) of recurrent pterygium, and the  $P$  value was significant ( $P = 0.0377$ ). Dellen was seen in 10 cases (2.6%) of primary pterygium and 4 cases (3.40%) of recurrent pterygium, without a significant  $P$  value ( $P = 0.483$ ).

#### 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, and graft tear. Early postoperative complications like dellen, Haematoma beneath the graft/sub conjunctival hemorrhage, graft edema, graft retraction/loss of graft, granuloma. Late postoperative complications include recurrence, corneal scleral necrosis, scleritis. [19]

A significantly higher number of patients with recurrence following surgery for unilateral primary pterygium were noted to have vascular pterygia (18.9 vs. 11.9%,  $P=0.026$ ). The pterygium morphology has been described as a significant risk factor for its recurrence. [20]

Steroid induced ocular hypertension has been reported in literature ranging from 2.97% to up to 40%. [21-23] Our overall outcome is in line with findings in the literature. Treatment of steroid-induced ocular hypertension is indeed stopping the use of topical steroids. However, because an early cessation can be related to a higher rate of recurrences, 8 cases of ocular hypertension in our patients were treated with topical prostaglandin until postoperative treatment ended. [23]

According to the study done by Nassar *et al.*, [24] there was no significant difference between primary and recurrent pterygium histologically, increased bleeding was noted during the excision of recurrent pterygium.

In patients with double head pterygium, vertical split conjunctival grafting was done and the procedure was considered under primary pterygium in this study. The studies done by the authors on vertical split conjunctival grafting have shown that vertical split conjunctival autograft with or without limbal orientation, just large enough to cover the bare sclera is a successful technique with promising results and has a lower recurrence rate. [25-27]

The other complications in primary and recurrent pterygium with significant  $P$  value ( $<0.05$ ) were graft edema and graft loss. The complications like sliding of the graft, graft retraction, dellen, granuloma, corneal melt were also been noted in both primary and secondary pterygium cases but were not clinically significant ( $P > 0.05\%$ ). Corneal melt was noted in only one case which had recurrent pterygium and none of the cases had scleral perforation or melt. The conventional method of managing pterygium in cataract cases is to perform the pterygium surgery first followed by

phacoemulsification. In cases with up to grade 2 pterygium with cataract and astigmatism <2 D can be managed in the same setting with good visual outcome. [28]

### Conclusion:

As noted here, a variety of problems might arise following pterygium surgery. Choosing the right method for a certain kind of pterygium and using the right graft fixation technique can result in a better outcome with fewer problems. This study showed a significantly elevated rate of recurrences and complications in cases with inadequate compliance with postoperative treatment, and proved that a shorter treatment course may provide similar surgical success than long-term tapering protocols.

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