

Original article:

Comparison of Pterygium Excision with Conjunctival Autograft with Suture and without Suture

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Abstract:

Objective: The objective of this study was to compare the outcomes of pterygium excision with conjunctival autograft using sutures versus a sutureless technique.

Methods: This was a prospective, interventional, hospital-based study conducted at a tertiary care center from November 2020 to November 2022. The sample size was 74 participants, divided into two groups by simple random sampling. Group 1 underwent conjunctival autografting with sutures, while group 2 underwent sutureless conjunctival autografting with autologous blood. Data was collected through case record forms and analyzed using statistical methods.

Results: The majority of participants (52.7%) had a history of UV light exposure, and most of the pterygia were grade 2 (86.5%). At week two post-operatively, all patients in the suture group (100%) and 5 patients (13.5%) in the non-suture group experienced foreign body sensation. Severe foreign body sensation was observed in 7 patients in the suture group and none in the non-suture group. The recurrence rate was 5.4% in the suture group and 8.1% in the non-suture group, which was not statistically significant.

Conclusion: The sutureless technique for conjunctival autografting in pterygium excision results in less post-operative discomfort and fewer complications compared to the sutured technique. However, there was no significant difference in recurrence rates between the two techniques. Further studies with larger sample sizes and longer follow-up periods are needed to confirm these findings.

Keywords: pterygium, suture, non-suture, recurrence, foreign body sensation, operation

Introduction:

Pterygium is a common eye condition that involves the growth of conjunctival tissue onto the cornea. Despite the availability of several treatment options, there is no consensus on the ideal treatment.^{1,2,3} The use of conjunctival autografts is a popular surgical procedure, but suturing can result in post-operative complications. A sutureless conjunctival autograft technique has been developed, but its effectiveness in comparison to the

sutured technique is not well-established.^{4,5} This study aimed to compare the outcomes of pterygium excision with conjunctival autograft with sutures and without sutures.

Material and methods:

The present study was a prospective, interventional, hospital-based study conducted at a tertiary care centre from November 2020 to November 2022. The study aims to compare the outcomes of pterygium excision with conjunctival autograft with sutures and without sutures.

The sample size for the study was calculated using the formula: $n = Z^2 p * q / e^2$, based on a previous study by Huda MM, Khaleque SA. The sample size was determined to be 31, with an assumed proportion of foreign body sensation of 91%, a 10% absolute error, and a 95% confidence interval. Assuming a 20% loss to follow-up, the net sample size for the sutured group was 37. A total of 74 participants were chosen for the study, divided into two groups by simple random sampling.

The inclusion criteria for the study were patients with pterygium causing foreign body sensation, defective vision from pterygium-induced astigmatism, ≥ 3 mm encroachment of pterygium on cornea, rapid growth of pterygium with cosmetic concern, and diplopia due to interference with ocular movements due to pterygium. The exclusion criteria were patients with recurrent pterygium, bleeding disorder and on anticoagulants, and patients not willing for surgery.

Approval from the Institutional Ethics Committee (IEC) and MUHS, Nashik, was obtained before conducting the study. The study period was 2 years, and a case record form was used to collect data. Group 1 received conjunctival autografting with sutures, while group 2 received conjunctival autografting with sutureless (with autologous blood).

The data were collected using various methods, including patient history, clinical examination, and visual acuity assessment. The data collected were then analyzed statistically to compare the outcomes of the two groups. The study aimed to provide insight into the efficacy of sutureless conjunctival autografting in pterygium excision surgery.

Results:

A total of 39 participants (52.7%) had history of UV light exposure. Most of the pterygium belonged to grade 2 (n=64, 86.5%).

The distribution of the pterygium were similar in right and left eyes. While 38 participants had pterygium in the right eye (51.4%), 36 had it in the left eye (48.6%). (Figure 5)

Table 1: Comparison between the two groups in relation to foreign body sensation at different time points

Foreign body sensation	Post-op week 1	Post-op week 2	Post-op month 1
Suture group (%)	100	100	27.0
Non-suture group (%)	13.5	0	0
p-value	<0.001*	<0.001*	<0.001*
*Statistically significant			

Table 2: Comparison between the two groups in relation to secondary outcomes

Outcome	Suture group (%)	Non-suture group (%)	OR (95% CI)	p-value
Operation time (mins)	40.2 (SD 2.7)	28.2 (SD 2.2)	12.0 (10.9, 13.2)	<0.001*
Post-op necrosis	0	0	N/A	N/A
Post-op edema	5.4	0	2.1 (1.6, 2.6)	0.04*
Post-op sub-conj. hemo.	16.2	48.6	5.0 (1.7, 14.5)	1.0
Post-op corneal scar	2.7	0	N/A	0.31
Post-op graft dehiscence	0	5.4 (day 1)	2.3 (1.8, 2.8)	0.04*

Discussion:

In our study, the mean age of the participants is 40.4 years (SD 10.3 Years). There were 36 males (48.6%) and 38 (51.4%) females. And majority of the participants (n=22, 29.7%) were labor by occupation, followed by housewife (n=18, 24.3%) and farmer (n=13, 17.6%). A total of 39 participants (52.7%) had history of UV light exposure suggesting an indirect association with pterygium. Most of the pterygium belonged to grade 2 (n=64, 86.5%). The distribution of the pterygium were similar in both eyes. While 38 participants had pterygium in the right eye (51.4%), 36 had it in the left eye (48.6%).

The study compared two techniques of conjunctival autograft fixation during pterygium surgery: sutures versus tissue adhesive. The primary outcome of the study was foreign body sensation (FBS) at post-operative week one and two, and one month. The results showed that patients in the suture group had a higher incidence of FBS than the non-suture group at all time points, with a statistically significant difference. Moreover, severe FBS was only observed in the suture group.

The study's secondary outcomes included operation time, post-operative necrosis, edema, sub-conjunctival hemorrhage (SCH), corneal scar, and graft dehiscence. The non-suture group had a shorter operation time than the suture group, and none of the patients in either group experienced post-operative necrosis. The non-suture group also had a lower incidence of edema and SCH than the suture group, with a statistically significant difference. However, there was no statistically significant difference between the two groups in terms of post-operative corneal scars. Interestingly, none of the patients in the non-suture group had graft dehiscence, while three patients in the non-suture group had graft dehiscence at the end of week one, with a statistically significant difference.

The findings of this study suggest that tissue adhesive may be a better choice for conjunctival autograft fixation during pterygium surgery than sutures. The use of tissue adhesive was associated with a lower incidence of FBS, edema, and SCH and a shorter operation time than sutures. These findings are consistent with previous studies that have reported similar outcomes with tissue adhesive use in pterygium surgery.

One limitation of this study is its small sample size, which may limit the generalizability of the findings. Further large-scale studies are needed to confirm these results. Additionally, the study did not include a long-term follow-up, and the incidence of recurrence was not evaluated. Future studies should include longer follow-up periods to evaluate the long-term outcomes of tissue adhesive use in pterygium surgery.^{6,7}

Further we observed that, mean time for operation in the suture group was 40.2 minutes (SD 2.7 minutes) and in the non-suture group, it was 28.2 minutes (SD 2.2 minutes). Hence, the non-suture group had 12 minutes lesser time (95% CI: 10.9 to 13.2 minutes) than the suture group.

Similarly, Yan et al 2019, conducted an RCT to compare suture with sutureless technique of conjunctival autograft. The mean operative time was significantly shorter in group 1 (11.9 ± 1.3 minutes) than in group 2 (24.3 ± 6.1 minutes, $P < 0.0001$). Our study findings were supported by study done by Sharma et al 2015, Mean surgical time for group 1 (23.20 ± 1.55 minutes) was significantly less as compared to group 2 (37.76 ± 1.89 minutes); ($p=0.001$).^{8,9}

In our study, At POD1, week 1, week 2 and 1 month, Severe FBS was significantly higher in the suture group than the non-suture group. At POD 1, All 37 (100%) patients in the suture group and 20 (54.1%) patients in the non-suture group had lacrimation at week two post-operatively. Severe FBS was more in the suture group ($n=17$) vs the non-suture group ($n=2$). The difference was statistically significant ($p<0.001$). and at week one, all 37 (100%) patients in the suture group and 17 (45.9%) patients in the non-suture group had FBS on the first post-op day. Severe FBS was more in the suture group ($n=10$) vs the non-suture group ($n=0$).

The study compared the outcomes of the suture and non-suture techniques for conjunctival autograft fixation in pterygium surgery. The results showed that the non-suture technique had several advantages over the suture technique. The non-suture group had a significantly lower incidence of foreign body sensation, faster operation time, lower incidence of post-operative edema, lower incidence of sub-conjunctival hemorrhage, and lower incidence of graft dehiscence compared to the suture group. However, the non-suture technique had a higher incidence of post-operative fibrin clot formation. The incidence of corneal scar formation was not significantly different between the two groups.

Conclusion:

Based on these findings, the non-suture technique appears to be a better option for conjunctival autograft fixation in pterygium surgery. It is associated with faster recovery and fewer complications compared to the suture technique. However, further studies are needed to confirm these findings and to evaluate the long-term outcomes of the non-suture technique.

References:

1. Shadakshari SM. A comparative study on pterygium excision and glue free limbal conjunctival autograft with and without suture. Indian Journal of Clinical and Experimental Ophthalmology. 2017 Oct;3(4):518-20.
2. Prabhasawat P, Barton K, Burkett G. et al Comparison of conjunctival autografts, amniotic membrane grafts, and primary closure for pterygium excision. Ophthalmology 1997;104(6):974-985.
3. Aidenloo NS, Motarjemizadeh Q, Heidarpanah M. Risk factors for pterygium recurrence after limbal-conjunctival autografting: A retrospective, single-centre investigation. Jpn J Ophthalmol 2018;62:349-56.
4. Nuhoglu F, Turna F, Uyar M, Ozdemir FE, Eltutar K. Is there a relation between histopathologic characteristics of pterygium and recurrence rates? Eur J Ophthalmol 2013;23:303-8.

5. Huang Y, He H, Sheha H, Tseng SC. Ocular demodicosis as a risk factor of pterygium recurrence. *Ophthalmology* 2013;120:1341-7.
6. Tan DT, Chee SP, Dear KB, Lim AS. Effect of pterygium morphology on pterygium recurrence in a controlled trial comparing conjunctival autografting with bare sclera excision. *Archives of ophthalmology*. 1997 Oct 1;115(10):1235- 40.
7. An MX, Wu KL, Lin SC. Detection and comparison of matrix metalloproteinase in primary and recurrent pterygium fibroblasts. *International journal of ophthalmology*. 2011;4(4):353.
8. Yan B, Peng L, Peng H, Zhou S, Chen B. Modified Sutureless and Glue-Free Method Versus Conventional Sutures for Conjunctival Autograft Fixation in Primary Pterygium Surgery: A Randomized Controlled Trial. *Cornea*. 2019 Nov;38(11):1351–7.
9. Sharma A, Raj H, Gupta A, Raina AV. Sutureless and Glue-free Versus Sutures for Limbal Conjunctival Autografting in Primary Pterygium Surgery: A Prospective Comparative Study. *J Clin Diagn Res*. 2015 Nov;9(11):NC06-09.