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Original Research Article

Comparison of efficacy and safety of sutureless glue-free versus suture technique for autogenous conjunctivolimbic grafting in primary pterygium excision

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ABSTRACT

Aim: To compare the efficacy and safety of sutureless glue-free versus suture technique for autogenous conjunctivolimbic grafting in primary pterygium excision.

Materials and Methods: A prospective observational study was conducted in thirty consecutive patients of primary progressive pterygium after taking their informed written consent and ethical clearance in a tertiary eye care centre of Northern India. Patients were randomly divided equally into group “A” and “B” each constituting fifteen patients. Group A patients underwent suture technique and group “B” patients underwent sutureless technique for conjunctivolimbic graft placement. Comparison of both groups was done in terms of intraoperative time, postoperative symptoms and recurrence over a period of one year. Data was compiled and entered into Microsoft Excel software and SPSS version 21.0 was used for data analysis.

Results: The mean duration of surgery was 42 min and 30 min in group A and B respectively and this difference was found to be statistically significant ($p=0.0001$). On 1st postoperative day, pain and foreign-body sensation was present in 12 patients in group A, while only 1 patient of group B had these symptoms and this difference was statistically significant ($p = 0.00014$). Postoperative hyperaemia was seen in 8 patients of group A and 6 patients of group B which was statistically insignificant ($p = 0.564$). Only two patients in group A had conjunctival chemosis while no patients in group B developed chemosis, and the difference was statistically insignificant ($p = 0.964$). Subconjunctival haemorrhage was seen in 2 patients of Group A and 1 patient of Group B which resolved over a period of 2-3 weeks. Conjunctivolimbic graft was found to be more stable in group A while it was misplaced in 1 patient of group B and the difference was statistically insignificant ($p = 1.000$). Only 1 patient of group A developed suture related complication i.e suture granuloma. Over a period of 1 year follow up, only 1 patient of group A had recurrence of pterygium.

Conclusion: Sutureless glue-free technique is a time saving, cost effective and better surgical modality in comparison to conventional suture technique for autogenous conjunctivolimbic grafting in primary pterygium resection.

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1. Introduction

Pterygium, is derived from a Greek word “pterygion” which means wing. It is a fleshy, wing-shaped, fibrovascular

growth of degenerative subconjunctival tissue and tenon’s capsule in interpalpebral area which will proliferate as a vascularised granular tissue and will cross over the limbus onto the cornea over the period of time.¹ It will invade the cornea resulting into destruction of Bowman’s membrane and the superficial stroma layers too in advanced cases.^{2,3}

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Its prevalence differs widely across the globe ranging from 0.7% to 31% in various studies around the world.⁴ In India, it is more prevalent in rural areas ranging from 9.52% to 13%.^{5,6}

Based on literature review and meta-analysis, risk factors for pterygium are ultraviolet light exposure, older age, male gender, outdoor activities and rural environment.⁷ Exposure to sunlight is the major contributing factor while cigarette smoking and use of sunglasses are protective factors against it.⁸ Its presenting clinical features are ocular irritation, watering, redness, foreign body sensation and grittiness. It can cause impairment of vision in advanced cases if it encroaches the cornea and obscures the visual axis.⁵

The only effective treatment for pterygium is surgical excision, though recurrence rate is high especially in young adults. Because of high rate of recurrence, frequently pterygium is conservatively managed until it encroaches towards central pupillary area causing excessive corneal astigmatism, leading to impaired vision.⁴ There are many techniques defined in literature for pterygium excision like simple excision with bare sclera and pterygium excision with tissue graft. Tissue graft used in pterygium surgery are conjunctival autografts and amniotic membrane grafts after primary pterygium excision to cover the bare sclera. Recurrence rate is very high after simple pterygium excision because of limbal stem cell deficiency and it is reported between 25–45%.⁹ To reduce the recurrence rate, surgical technique was modified by Spaeth et al. using conjunctival autograft, which can be secured by absorbable/non-absorbable suture (suture technique) or by fibrin glue/autologous serum (sutureless technique) for covering bare sclera after primary pterygium excision.¹⁰

Now a days, pterygium excision with conjunctivolimbic autograft is standard surgical treatment for primary progressive pterygium. Limbal stem cell graft act as a barrier for migration of conjunctival epithelial cells on cornea; thus preventing its recurrence.^{11,12} Affordability being the major issue in developing countries like India, autologous serum was used for sutureless technique to make the surgery more cost-effective. Till date very few studies are available, therefore this study was conducted to compare the efficacy and safety of sutureless technique vs suture technique of conjunctival autografting in pterygium excision.

2. Materials and Methods

A prospective observational study was conducted in thirty consecutive patients of primary progressive pterygium after taking their informed written consent in a tertiary eye care centre of Northern India. This study was conducted after taking ethical clearance from Institutional Ethics Committee over a period of one year from March 2020 to April 2021. A thorough evaluation was done, including patient's demographic profile, duration of sunlight exposure, use of

protective glasses, outdoor activities and relevant medical and ocular history was recorded, followed by complete ophthalmic examination.

Patients presenting with primary progressive pterygium were included after taking their informed written consent.

Patients with recurrent pterygium, pseudo-ptyerygium, aspirin or other blood thinners intake or coagulation factor deficiency cases were excluded from the study.

Then patients were randomly divided into 2 groups: group "A" and "B" of 15 each. In all 30 patients, pterygium excision with conjunctival autografting was performed, however, in Group A patients, autograft was secured with absorbable 8-0 vicryl (suture technique) and in group "B" patients, autograft was secured with autologous serum (sutureless technique).

All surgeries were carried out under peribulbar anaesthesia using a combination of lignocaine (2%) and bupivacaine (0.5%) with injection hyaluronidase. Then the eye was cleaned with betadine followed by sterile draping. After applying universal speculum, 1 ml injection lignocaine mixed with adrenaline was given under the neck of pterygium. Pterygium was excised using crescent blade. Haemostasis was achieved using pressure with adrenaline soaked cotton buds and no cauterization was done. Then conjunctival defect dimensions were measured with a calliper and conjunctivolimbic autograft measuring 1mm more than the measured dimensions was procured from the supertemporal quadrant of the bulbar conjunctiva. Then autograft was flipped over the cornea, maintaining proper orientation. Depending on the allotted group, the autograft was secured either with multiple interrupted absorbable 8-0 vicryl suture or autologous serum.

Surgical time was recorded in every patient from lid speculum application to its removal. Postoperatively, subjects in all the groups were prescribed eye drop moxifloxacin with prednisolone QID for 2 weeks followed by tapering over a period of next 2 weeks. Patients were also prescribed carboxy methyl cellulose tear eye drops, QID for 4 weeks. All patients were followed up on day 1, day 7, day 14, 1 month, 3 months, 6 months and 1 year postoperatively. All Patients were enquired about symptoms like pain, foreign body sensation, tearing and ocular discomfort and their response was recorded. At final postoperative visit of 1 year, the presence of recurrence, if any, was recorded.

All the data was compiled and analysed using SPSS version 21.0. Comparison of both groups was done in terms of intraoperative time, postoperative symptoms and recurrence over a period of one year.

3. Results

Thirty patients were enrolled in this study, out of which 15 were allocated group A who underwent pterygium excision with conjunctivolimbic autografting using suture technique

and 15 were allocated group B who underwent glue free sutureless technique.

Out of thirty patients, there were 18 (60%) males and 12 (40%) females in the age group of 20 to 70 years, with average being 58.7 ± 6.87 years. There was significant male preponderance, with M:F ratio being 3:2. In our study, majority of patients 40% (12/30) belonged to age group 41-50 years (Figure 1).

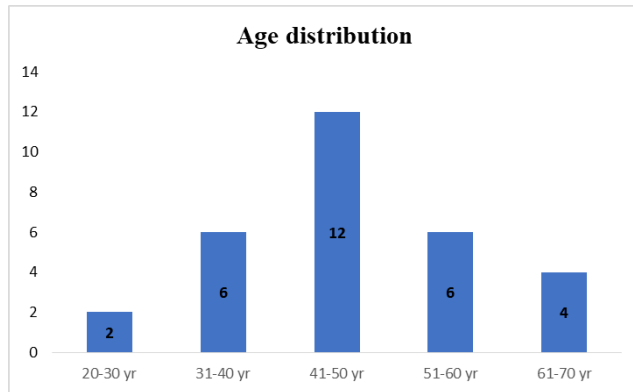


Fig. 1: Age distribution

In group A, there were 10 (66.7%) males and 5 (33.3%) females whereas in group B, there were 8 (53.33%) males and 7 (46.67%) females (Figure 2). The age of patients in the group A ranged from 27 years to 68 years, with average being 50.7 ± 4.53 years and the age of patients in the group B ranged from 22 years to 70 years, with average being 64.5 ± 5.87 years.

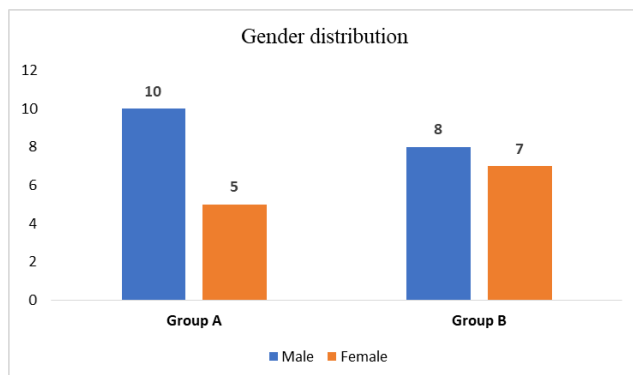


Fig. 2: Gender distribution among Group A & B

Out of 30 patients presenting with primary progressive pterygium, 24 (80%) patients belonged to rural background while only 6 (20%) patients were from urban area. Out of 30 patients, 27 (90%) patients were outdoor workers by occupation and had sunlight exposure of > 6 hours (Figure 3). None of the patient had history of use of protective eye glasses. Depending on location, 21(70%) patients were having nasal pterygium while 9 (30%) were having temporal

pterygium. Bilateral pterygium was seen in only 2 (6.67%) patient out of 30 patients.

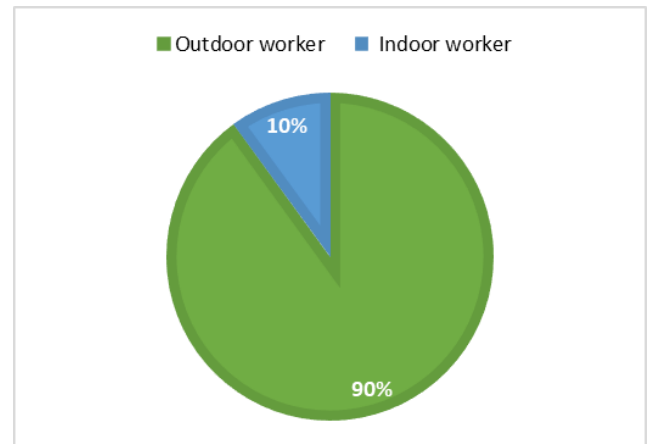


Fig. 3: Distribution in terms of occupation

In Group A (suture technique group), intraoperative time was in range of 45-55 min with a mean of 42 min duration, however in group B (glue free sutureless technique group), it ranged from 25 to 40 min with a mean duration of 30 min. The difference in intraoperative time in both groups was statistically significant with a $p = 0.0001$.

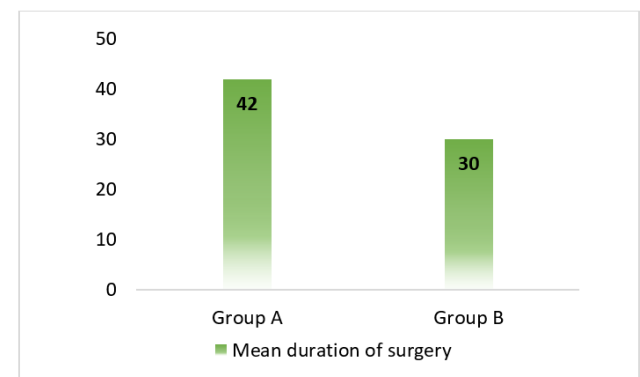


Fig. 4: Comparison of mean duration of surgery in group A and group B

On 1st postoperative day, pain and foreign-body sensation was present in 12 patients in group A, while only 1 patient of group B had these symptoms and this difference was statistically significant ($p = 0.00014$). In both groups, these symptoms were for 1 week though intensity decreased progressively and group B patients were pain-free early than group A patients.

In group A, postoperative hyperaemia was seen in 8 patients and 6 patients in group B, but it was statistically insignificant ($p = 0.564$). Postoperatively, conjunctival chemosis was present in only two patients in group A while no patients in group B developed chemosis, but

Table 1: Comparison of Group A and B in terms of postoperative signs and symptoms

Postop symptoms/signs	Group A (Suture technique)	Group B (Sutureless technique)	p value
Pain & FB sensation	12	1	0.00014
Conjunctival hyperaemia	8	6	0.564
Conjunctival chemosis	2	0	0.964
Subconjunctival haemorrhage	2	1	1.000
Graft retraction	0	1	1.000

the difference was not statistically significant ($p = 0.964$). Subconjunctival haemorrhage was seen in 2 patients of Group A and 1 patient of Group II which resolved over a period of 2-3 weeks. Conjunctivolimbic graft was more stable in group A while it was misplaced in 1 patient in group B and the difference was statistically insignificant ($p = 1.000$). Only 1 patient of group A developed suture related complication i.e suture granuloma. Over a period of 1 year follow up, only 1 patient of group A had recurrence of pterygium (Figure 5).

4. Discussion

Pterygium is a common ocular surface disorder, frequently seen in dry and dusty environment. Its management is primarily surgical only with multiple surgical options available and primary aim is recurrence prevention.¹³ It is a never ending debate for an “ideal” pterygium surgery but pterygium excision with conjunctivolimbic autografting is proven to be the most effective method for pterygium surgical management with only 2-9% reported recurrence rate and an added advantage of covering limbal stem cell deficiency.^{14,15} The conjunctivolimbic autograft can be fixed with various modalities like sutures, fibrin glue or glue-free autologous serum technique.

Other surgical methods for pterygium management include conjunctival flap, conjunctivolimbic rotation autograft, amniotic membrane transplant, cultivated conjunctival transplant and lamellar keratoplasty. The sutures may lead to foreign body sensation, delayed wound healing, fibrosis, pyogenic granuloma, symblepharon, diplopia, ocular motility restriction and scleral necrosis.¹⁶ As fibrin glue is human plasma derivative; so it is associated with risk of transmission of blood-related transmissible diseases.¹³ In such scenarios, autologous blood is a better option, only exception being patients on blood thinners like aspirin or suffering from coagulation factor deficiency.¹⁷

We did this study to compare the efficacy and safety of glue-free sutureless versus suture technique for conjunctivolimbic autografting in primary pterygium excision. In Group A (suture technique group), intraoperative time was significantly more (42 min) than group B (30 min) and the difference was statistically significant ($p = 0.0001$). In terms of postoperative symptoms, pain and foreign-body sensation was present in

12 patients in group A on POD-1, while only 1 patient of group B complained of these symptoms and this difference was found to be statistically significant ($p = 0.00014$). In both groups, pain and foreign body sensation continued for 1 week and group B patients were pain-free early than group A patients. Other complications such as conjunctival hyperaemia, conjunctival chemosis, subconjunctival haemorrhage and graft-related complications were almost comparable in both groups and were statistically insignificant. The sutureless glue-free technique not only significantly shortens the duration but the cost of surgery also reduces drastically.

5. Conclusion

Sutureless glue-free technique is a time saving and better surgical modality as compared to conventional suture technique for autogenous conjunctivolimbic grafting in primary pterygium excision. In third world countries like India, where affordability is a major issue, glue-free sutureless technique is a better and cost-effective modality in comparison to conventional suture technique and fibrin glue sutureless technique with no risk of viral transmission.

6. Source of Funding

None.

7. Conflict of Interest

None.

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