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Original Research Article

Suture Less and Glue-Free Inferior Limbal Conjunctival Autograft Transplantation in Primary Pterygium Surgery: A Case Series

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Abstract: ***Introduction:*** Conjunctival autografting which is the mainstay in the management of pterygium. The conjunctival graft is most commonly harvested superiorly. However, superior bulbar conjunctiva may not be available for harvesting a graft in all cases and it would affect the outcome. This study aims at the efficacy of the inferior bulbar conjunctival grafting without using any suture or glue. ***Methods:*** This was a prospective observational study conducted in the Department of Ophthalmology, Pabna Medical College Hospital, Pabna, Bangladesh during the period from January 2019 to December 2020. In our study, we included 100 eyes of 98 patients with primary pterygium who underwent surgical procedures in Pabna Medical College Hospital. ***Results:*** A total of 100 cases were included in this case series. Patient's age ranged from 18 to 83 years (mean 48.08±12.76 years). Total graft dehiscence occurred in 2 eyes (2%), graft retraction in 10 eyes (10%), and recurrence was seen in 1 eye (1%). At 3 months postoperatively, the gain in uncorrected visual acuity ranged from 2-3 lines in the Snellen chart in 9 eyes, symblepharon does not occur in any patient and no other complication was noted. ***Conclusion:*** Our study shows that this simple technique for pterygium surgery may prevent the potential risk of bad outcomes of future filtration surgery and overcome the conditions when superior bulbar conjunctiva may not be available for harvesting a graft.

Keywords: Pterygium surgery, Inferior conjunctival autograft, Suture less glue-free conjunctival autograft.

INTRODUCTION

Pterygium is a disorder of the ocular surface characterized by the growth of fibrovascular tissue leading to the destruction of Bowman's membrane. Conjunctival autografting which is the mainstay in the management of pterygium, has been shown to have a lower recurrence rate when compared to other surgical options [1-7]. The conjunctival graft is most commonly harvested superiorly. It is not always possible to harvest a graft from the superior bulbar conjunctiva, such as when there is conjunctival scarring from trauma or surgery. Similarly, grafting from the superior site may also not be possible in the eyes with filtering blebs and it would affect the outcome and functioning of a future filtration surgery. Therefore, inferior bulbar conjunctival grafting, amniotic membrane grafting, bare sclera method, and conjunctival tissue grafting from the overlaying pterygium itself are possibilities that can be used in such circumstances. The most advanced method for treating pterygium these days involves rotating the conjunctiva flap or implanting autografts with or without limbal stem cells to completely resurface the conjunctival defect [8-16]. Amniotic membrane has also been used successfully as a conjunctival substitute for covering an extensive conjunctival defect after thorough pterygium excision [17-20]. Furthermore, radiotherapy or postoperative 0.04% mitomycin C (MMC) topical administrations have been used as adjunct therapies. However, each of these was later reported to have uncommon but severe complications, including scleral ulceration, corneal ulceration, scleral thinning, glaucoma, and cataracts [21]. Therefore, a simple surgical procedure that can reduce the recurrence rate to an acceptable level with minimal complications and without the use of potentially toxic drugs or radiotherapy would be ideal for the management of pterygium. According to recent findings, fibrin glue is preferable to sutures. Fibrin glue has been shown to increase patient comfort, shorten recovery times, and lower the risk of problems and recurrence [22-26]. Suture-related complications include infection, prolonged operation time, postoperative discomfort, suture abscesses, buttonholes and pyogenic granuloma which usually

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require a second surgery for removal and chronic inflammation [27]. Plasma-derived fibrin glue has the potential risk of prion disease transmission and anaphylaxis in susceptible individuals. Sutureless grafting has been used successfully in gingival grats [28] and represents a similar mucosal membrane tissue environment to the conjunctiva of the eye.

This study aims at the efficacy of the inferior bulbar conjunctival grafting without using any suture or glue.

METHODOLOGY

This was a prospective observational study conducted in the Department of Ophthalmology, Pabna Medical College Hospital, Pabna, Bangladesh during the period from January 2019 to December 2020. In our study, we included 100 eyes of 98 patients with primary pterygium who underwent surgical procedures in Pabna Medical College Hospital.

These are the following criteria to be eligible for enrollment as our study participants: a) Patients of all ages and either sex presenting with primary pterygium; b) Patients who were willing to participate were included in the study; And a) Patients suffering from another intraocular or ocular surface disease; b) Patients with both nasal and temporal pterygium; c) Patients non-compliant to follow-up; e) Patients enrolled in other study groups

Preoperative Ophthalmic Evaluation: Uncorrected and best-corrected visual acuity, digital anterior segment photography, slit-lamp examination, fundoscopy, and measurement of intraocular pressure.

Surgical Technique: Preoperative peribulbar anesthesia was administered using a 2% lignocaine to 0.5% bupivacaine in l:l ratio. A spring scissor was used to cut a line 1 mm medial to the limbus over the pterygium, removing only the conjunctiva. The body was then dissected using blunt and sharp tools to remove the overlying conjunctiva as smoothly and clearly as possible. The pterygium's body was cut 4 mm from the limbus to the exposed sclera. The sclera was left bare after the thicker portion of the conjunctiva and surrounding Tenons capsule as well as the subconjunctival pterygium tissue, were removed. Avulsion was used to remove the pterygium from the cornea. Calipers were used to measure the bare sclera's size, which was recorded in millimeters squared (mm^2). The graft was taken from the inferior quadrant of the bulbar conjunctiva. The tips of the calipers were used to designate the four corners to harvest the conjunctival autograft. Using Wescotl tenotomy scissors, two tiny incisions were made at the limbal site, and the entire graft was carefully bluntly dissected until it was free from tenons reaching the limbus to include limbal stem cells that act as a barrier to the conjunctival cells migrating onto the corneal surface.

The edges of the graft were then cut with Vannas scissors. Forceps were utilized to gently transfer the graft to the recipient bed, maintaining the epithelial side up and the limbal edge towards the limbus. Hemostasis was allowed to occur spontaneously with minimal use of cautery to provide autologous fibrin to glue the conjunctival autograft naturally in position without tension and the scleral bed was viewed through the transparent conjunctiva to ensure that residual bleeding did not lift the graft.

The graft was held in place for 1 minute, after which its stability was examined with a Merocel spear centrally and on each free edge to confirm tight adherence to the sclera. The eye was bandaged for twenty-four hours. Following surgery, a pressure eye patch was applied. Analgesia was administered twice daily. Tab was added in the post-operative medication list. Ciprofloxacin 500 mg bid for 5 days, dexamethasone with tobramycin eye ointment three times daily for one week, gradual tapering for three weeks, and liberal use of topical lubricating eye drops four times daily for four weeks. The patients were told not to rub their eyes and to stay out of the sun, heat, and dust. To lessen their exposure to UV rays, the patients were additionally advised to wear sunglasses.

Follow-up: After twenty-four hours, one week, one month, three months, and six months, all patients were monitored. Each follow-up appointment, particularly the first three, involved patients filling out a questionnaire that graded discomfort, foreign body (F.B.) feeling, photophobia, hyperemia, and chemosis into four intensity-based categories. From 0 to 3, the scale was as follows: 0 for nothing, 1 for mild, 2 for moderate, and 3 for severe. The information was gathered as mean scores and documented. Graft dehiscence, graft retraction, recurrence rate (defined as fibrovascular growth invading the cornea more than 1 mm at the site of previously removed pterygium), and gain in uncorrected visual acuity (UCVA) were the primary postoperative outcomes observed.

Statistical Analysis: All data were recorded systematically in preformed data collection form. Quantitative data was expressed as mean and standard deviation and qualitative data was expressed as frequency distribution and percentage. Statistical analysis was performed by using SPSS 16 (Statistical Package for Social Sciences) for Windows version 10. The study was approved by the Institutional Review Board of Pabna Medical College Hospital.

RESULTS

Table 1: Demographic Profile of the Study Population

Demographic Data	**(n=100)**
Range of age in (years)	18-83
Mean age in (years)	48.08±12.76
Sex	
Males	36
Females	62
Laterality	
Right	58
Left	40
Both	02
Site of pterygium	
Only Nasal	95
Only Temporal	05
Size of pterygium in mm length mean & SD	4.378+1.534

Table 1 shows the pterygia was located nasally in 95 eyes, in 5 cases it was on the temporal pterygium. Patient age ranged from 18 to 83 years (mean 48.08±12.76years). There were 36 males and 62 females. In 58 eyes, pterygium was present in the right eye and 40 in the left eye and 2 patients had pterygium in both eyes. The size of pterygium ranged from 2-6mm in length with a mean & SD of 4.378+1.534.

Table 2: Showing postoperative main and secondary outcomes (n=100)

Outcome	**n(%)**
Recurrence rate	1(1%)
Graft dehiscence	2(2%)
Early graft retraction	10(10%)
Medial side	8(8%)
Upper side	2(2%)
Early Graft oedema	12(12%)
Haemorhage underneath the graft	
On 1st Follow up	18(18%)
On 2nd Follow up	8(8%)
On 3rd Follow up	0(0%)
Gain in UCVA	10(10%)
Conjunctival edema	7(7%)
Conjunctival granuloma	0(0%)
Corneal scar(faint nebula)	6(6%)
Dellen	0(0%)
Conjunctival cyst	0(0%)
Graft necrosis	0(0%)
Symblepharon	0(0%)
Scleral necrosis	0(0%)
Scleral thinning	0(0%)

Table 2 presents the main and secondary postoperative outcomes. The recurrence rate was 1%, and recurrence occurred after 3 months. In two patients graft dehiscence occurred, one following vigorous rubbing of the eye on the third postoperative day another case cause was not found. Retraction of conjunctival graft occurs in l0 cases among them 8 on the medial side & 2 in the upper side that was found in the first 3 visits that were filled with adjacent conjunctiva seen in the 4th visit. Graft edema and thickening were seen on the seventh postoperative day in 7 patients that were subsided and were not found on the 3rd visit (after one month), heamorrhage underneath the graft was found in 18 cases on 2nd visit, 8 cases on 3rd visit, and none in 4th visit. The gain in uncorrected visual acuity (UCVA) occurred 3 months postoperatively and ranged from 2-3 lines in 10 eyes. All cases with a gain in UCVA were due to clearance of the visual axis occupied by pterygium pre-operatively. Conjunctival edema occurred in 6 eyes (6%). Most cases of conjunctival edema resolved gradually within the month. Faint corneal nebula occurred in 6 eyes (6%).

Figure l: Nasal pterygium before & after surgery, after 1 month & after six months (Graft taken from inferior conjunctiva)

DISCUSSION

The surgeon should select an operating strategy that considers the possibility of more aggressive recurrent pterygium to minimize recurrence. Hence, the aim of pterygium surgery should not only be the excision of pterygium but also the prevention of its recurrence. Generally, pterygium recurrences occur within the first 6months after surgery [29]. One such method to prevent recurrence is autologous limbal conjunctival grafting. Autologous limbal conjunctival transplantation considerably reduces the recurrence rate by restoring the limbus barrier function.

In this study the recurrence rate (1%). Massaoutis *et al.,* [30] stated that the concept of surgical success in pterygium surgery can be defined as the provision of a white cosmetic conjunctiva, with no persistent symptoms and a low recurrence rate (less than 10%). The recurrence rate in our study agrees with Massaoutis *et al.,*'s criteria. The recurrence rate is also similar to Malik *et al.,* [31] who reported a recurrence rate of 2.5% using a sutureless and glue-free graft from a superior conjunctival autograft.

Graft dehiscence is a recognized complication of techniques using glue [32]. Foroutan *et al.,* [33] observed a 13.33% percentage of graft dehiscence while using autologous fibrin. They attributed this to the lower concentration of fibrinogen and thrombin in the autologous glue compared to a commercial formulation. In our study, graft dehiscence occurred in 2 eyes (2%) which was due to the patient rubbing the eye vigorously. To prevent eye irritation during the first week following surgery, we advise patients to wear protective glasses. For graft uptake to be successful, the thin donor limbal conjunctival autograft must be carefully dissected and free of Tenon's capsule.

Graft retraction was reported by Tan [34] who advocated sub-conjunctival fibrosis and recommended meticulous dissection of sub-epithelial graft tissue. Foroutan *et al.,* [33] reported 20% of cases with graft retraction, in our study graft retraction occurred in 10 eyes out of 100 eyes, among them 8 from the medial side and 2 from the upper side. All the cases of graft retraction were resolved with conservative treatment.

Wit *et al.,* [35] also proposed that the apposition of the eyelids to the bulbar conjunctiva provides a natural biological dressing, compression, and a smooth frictionless surface.

Pyogenic granuloma and dellen did not occur. Conjunctival edema occurred in our study in 7 eyes (7%). All cases resolved spontaneously with conservative treatment. Symblepharon does not occur in any patient to avoid symblepharon we use dexamethasone with tobramycin eye ointment three times a day for 1 month.

None of our patients developed serious complications such as scleral necrosis, scleral thinning, graft necrosis, excessive bleeding, medial rectus muscle injury, or globe perforation.

Limitations of the study

Our study was a single-center study. We took a small sample size due to our short study period. After evaluating those patients, we did not follow up with them for the long term and did not know other possible interference that may happen in the long term with these patients.

CONCLUSION AND RECOMMENDATIONS

In comparison to other procedures, a sutureless and glue-free inferior limbal conjunctival autograft is safe, successful, and cost-efficient. Surgical results after initial pterygium surgery are also comparable. It is therefore recommended to use inferior conjunctival autograft for patients who may require glaucoma filtration surgery in the future.

So further study with a prospective and longitudinal study design including a larger sample size needs to be done to validate the findings of our study.

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Ethical Approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Kenyon, K. R., Wagoner, M. D., & Hettinger, M. E. (1985). Conjunctival autograft transplantation for advanced and recurrent pterygium. *Ophthalmology*, *92*(11), 1461-1470.

2. Ti, S. E., Chee, S. P., Dear, K. B. G., & Tan, D. T. H. (2000). Analysis of variation in success rates in conjunctival autografting for primary and recurrent pterygium. *British journal of ophthalmology*, *84*(4), 385-389.
3. Allan, B. D., Short, P., Crawford, G. J., Barrett, G. D., & Constable, I. J. (1993). Pterygium excision with conjunctival autografting: an effective and safe technique. *British journal of ophthalmology*, *77*(11), 698-701.
4. Figueiredo, R. S., Cohen, E. J., Gomes, J. A., Rapuano, C. J., & Lailson, P. R. (1997). Conjunctival autograft for pterygium surgery: how well does it prevent recurrence?. *Ophthalmic Surgery, Lasers and Imaging Retina*, *28*(2), 99-99.
5. Sharma, A., Gupta, A., Ram, J., & Gupta, A. (2000). Low-dose intraoperative mitomycin-C versus conjunctival autograft in primary pterygium surgery: long term follow-up. *Ophthalmic Surgery, Lasers and Imaging Retina*, *31*(4), 301-307.
6. Lewallen, S. (1989). A randomized trial of conjunctival autografting for pterygium in the tropics. *Ophthalmology*, *96*(11), 1612-1614.
7. Riordan-Eva, P., Kielhorn, I., Ficker, L. A., Steele, A. D., & Kirkness, C. (1993). Conjunctival autografting in the surgical management of pterygium. *Eye*, *7*(5), 634-638.
8. Duke-Elder, S. S. (1977). Degenerative and pigmentary changes. *System of ophthalmology*, *3*, 569-85.
9. Kenyon, K. R., Wagoner, M. D., & Hettinger, M. E. (1985). Conjunctival autograft transplantation for advanced and recurrent pterygium. *Ophthalmology*, *92*(11), 1461-1470.
10. Güler, M., Sobaci, G., Ilker, S., Öztürk, F., Mutlu, F. M., & Yildirim, E. (1994). Limbal-conjunctival autograft transplantation in cases with recurrent pterygium. *Acta ophthalmologica*, *72*(6), 721-726.
11. Shimazaki, J., Yang, H. Y., & Tsubota, K. (1996). Limbal autograft transplantation for recurrent and advanced pterygia. *Ophthalmic Surgery, Lasers and Imaging Retina*, *27*(11), 917-923.
12. Mutlu, F. M., Sobaci, G., Tatar, T., & Yildirim, E. (1999). A comparative study of recurrent pterygium surgery: limbal conjunctival autograft transplantation versus mitomycin C with conjunctival flap. *Ophthalmology*, *106*(4), 817-821.
13. Gris, O., Güell, J. L., & del Campo, Z. (2000). Limbal-conjunctival autograft transplantation for the treatment of recurrent pterygium. *Ophthalmology*, *107*(2), 270-273.
14. Dekaris, I., Gabrić, N., Karaman, Ž., Mravičić, I., & Kaštelan, S. (2002). Limbal-conjunctival autograft transplantation for recurrent pterygium. *European journal of ophthalmology*, *12*(3), 177-182.
15. Syam, P. P., Eleftheriadis, H., & Liu, C. S. (2003). Inferior conjunctival autograft for primary pterygia. *Ophthalmology*, *110*(4), 806-810.
16. Hirst, L. W. (2008). Prospective study of primary pterygium surgery using pterygium extended removal followed by extended conjunctival transplantation. *Ophthalmology*, *115*(10), 1663-1672.
17. Prabhasawat, P., Barton, K., Burkett, G., & Tseng, S. C. (1997). Comparison of conjunctival autografts, amniotic membrane grafts, and primary closure for pterygium excision. *Ophthalmology*, *104*(6), 974-985.
18. Shimazaki, J., Shinozaki, N., & Tsubota, K. (1998). Transplantation of amniotic membrane and limbal autograft for patients with recurrent pterygium associated with symblepharon. *British Journal of Ophthalmology*, *82*(3), 235-240.
19. Solomon, A., Pires, R. T., & Tseng, S. C. (2001). Amniotic membrane transplantation after extensive removal of primary and recurrent pterygia. *Ophthalmology*, *108*(3), 449-460.
20. Fallah, M. R., Golabdar, M. R., Amozadeh, J., Zare, M. A., Moghimi, S., & Fakhraee, G. (2008). Transplantation of conjunctival limbal autograft and amniotic membrane vs mitomycin C and amniotic membrane in treatment of recurrent pterygium. *Eye*, *22*(3), 420-424.
21. Rubinfeld, R. S., Pfister, R. R., Stein, R. M., Foster, C. S., Martin, N. F., Stoleru, S., ... & Speaker, M. G. (1992). Serious complications of topical mitomycin-C after pterygium surgery. *Ophthalmology*, *99*(11), 1647-1654.
22. Ayala, M. (2008). Results of pterygium surgery using a biologic adhesive. *Cornea*, *27*(6), 663-667.
23. Kim, H. H., Mun, H. J., Park, Y. J., Lee, K. W., & Shin, J. P. (2008). Conjunctivolimbal autograft using a fibrin adhesive in pterygium surgery. *Korean Journal of Ophthalmology*, *22*(3), 147-154.
24. Koranyi, G., Seregard, S., & Kopp, E. D. (2004). Cut and paste: a no suture, small incision approach to pterygium surgery. *British journal of ophthalmology*, *88*(7), 911-914.
25. Koranyi, G., Seregard, S., & Kopp, E. D. (2005). The cut-and-paste method for primary pterygium surgery: long-term follow-up. *Acta Ophthalmologica Scandinavica*, *83*(3), 298-301.
26. Allan, B. D., Short, P., Crawford, G. J., Barrett, G. D., & Constable, I. J. (1993). Pterygium excision with conjunctival autografting: an effective and safe technique. *British journal of ophthalmology*, *77*(11), 698-701.
27. Tan, D. (1999). Conjunctival grafting for ocular surface disease. *Current opinion in ophthalmology*, *10*(4), 277-281.
28. Dorfman, H. S., Kennedy, J. E., & Bird, W. C. (1980). Longitudinal evaluation of free autogenous gingival grafts. *Journal of clinical periodontology*, *7*(4), 316-324.
29. Adamis, A. P., Starck, T., & Kenyon, K. R. (1990). The management of pterygium. *Ophthalmol Clin North Am*, *3*(4), 611-23.
30. Massaoutis, P., Khemka, S., & Ayliffe, W. (2006). Clinical outcome study of a modified surgical

technique for pterygium excision. *Canadian journal of ophthalmology*, *41*(6), 704-708.

31. Malik, K. P. S., Goel, R., Gupta, A., Gupta, S. K., Kamal, S., Malik, V. K., & Singh, S. (2012). Efficacy of sutureless and glue free limbal conjunctival autograft for primary pterygium surgery. *Nepalese Journal of ophthalmology*, *4*(2), 230-235.
32. Uy, H. S., Reyes, J. M. G., Flores, J. D., & Lim-Bon-Siong, R. (2005). Comparison of fibrin glue and sutures for attaching conjunctival autografts after pterygium excision. *Ophthalmology*, *112*(4), 667-671.
33. Foroutan, A., Beigzadeh, F., Ghaempanah, M. J., Eshghi, P., Amirizadeh, N., Sianati, H., & Foroutan, P. (2011). Efficacy of autologous fibrin glue for primary pterygium surgery with conjunctival autograft.
34. Tan, D. (1999). Conjunctival grafting for ocular surface disease. *Current opinion in ophthalmology*, *10*(4), 277-281.
35. de Wit, D., Athanasiadis, I., Sharma, A., & Moore, J. (2010). Sutureless and glue-free conjunctival autograft in pterygium surgery: a case series. *Eye*, *24*(9), 1474-1477.

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