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ORIGINAL RESEARCH

Inferior conjunctival autografting for pterygium surgery: an alternative way of preserving the glaucoma filtration site in far western Nepal

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Background: The purpose of this study was to evaluate the outcome of pterygium excision with inferior conjunctival autografting for primary pterygium.

Methods: This was a prospective noncomparative interventional case series study enrolling 50 eyes of 50 patients with primary pterygium between November 1, 2010 and October 30, 2011. All patients underwent the standard surgical technique for pterygium excision with inferior conjunctival autografting. The sampling method was purposive. The study variables were complications of surgery and recurrence rates during a follow-up period of 6 months.

Results: The mean age of the patients was 43 ± 7.97 (range 26–64) years. Grade 1 pterygium comprised 64% while grade 2 pterygium comprised 36% of cases. The mean size of pterygium was 3.2 ± 0.60 mm. Minor complications did occur, but only 4% required resuturing. Recurrence occurred in two eyes (4%) which we detected 3 months after surgery in both cases. We observed conjunctival scarring at the donor site in four eyes (8%); however, there was no symblepharon formation or restriction of upgaze.

Conclusion: Inferior conjunctival autografting is an effective technique with a low recurrence rate. This is a useful technique when it is not possible or desirable to use the superior conjunctiva as a donor source. It is an especially good option for preserving the glaucoma filtration site for the future.

Keywords: inferior, conjunctival, autografting, pterygium surgery, recurrence

Introduction

The prevalence of pterygium varies from country to country relative to proximity to the equator. It is more common in warm and dry climates. The prevalence of pterygium is 2%–7% in the US and 1.1% in Australia.[1,2] The Beijing study showed the prevalence of pterygium to be 3%, while in Tehran its prevalence is 1.3%.[3,4] It has a prevalence of 19.6% in those aged 40 years in rural Myanmar according to a population-based cross-sectional survey.[5] However, in Nepal, there is no exact population-based study showing the prevalence of pterygium.

Pterygium is a degenerative ocular surface disorder with wing-shaped fibrovascular growth of the bulbar conjunctiva onto the cornea, which is strongly correlated with ultraviolet light exposure, dryness, exposure to wind, dust, and heat, and oncogenes or viruses. It is most common in the nasal site, suggesting possible light reflectivity from the nasal bridge over the pterygium site, but it can also occur in the temporal site. Destruction of Bowman's layer by fibrovascular ingrowth, which causes mild inflammatory changes in the cornea as well as the conjunctiva, has been demonstrated. The epithelium may be normal, thick, or thin, but it may occasionally show dysplasia.

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Pterygium has a bimodal age distribution, occurring particularly in the young and the elderly.[1,6–8]

Treatment of pterygium is surgical. In general, conservative therapy for pterygium is warranted unless one of the following is present: loss of visual acuity because of induced astigmatism or encroachment onto the visual axis, marked cosmetic deformity, marked discomfort and irritation unrelieved by medical management, limitation of ocular motility secondary to restriction, or documented progressive growth toward the visual axis so that ultimate loss of vision can reasonably be assumed. In such circumstances, surgical intervention is required. The fact that numerous different techniques exist for the surgical treatment of pterygium underscores the point that no single approach is universally successful.[9]

Susruta first described the surgical methods for pterygium in 1897. Since then, many authors have described a considerable number of surgical techniques for its management. There are many surgical techniques, including pterygium excision with bare sclera, conjunctival autografting, amniotic membrane grafting, and adjuvant use of mitomycin C or thiotepa. However, recurrence-free surgery for pterygium continues to present a challenge. Kenyon and colleagues reported the first use of free conjunctival autografting for pterygium surgery in 1985.[11] Several large multicenter studies have shown that conjunctival autografting has a low recurrence rate, and in all these studies the graft was taken from the superior bulbar conjunctiva.[10–18] However, there is limited information available regarding the efficacy of a graft taken from the inferior conjunctiva. The purpose of this study was to determine the outcome of surgery using inferior conjunctival autografting and to address the importance of preserving the glaucoma filtration site.

Methodology

This was a prospective, noncomparative, interventional case series study enrolling 50 eyes of 50 patients with pterygium between November 1, 2010 and October 30, 2011 at Geta Eye Hospital, Dhangadhi, Nepal. The sampling method was purposive. The study protocol was approved by the hospital institutional review committee. The patients were informed about the design of the study and procedure, and written informed consent was obtained from all patients. Only primary pterygium cases were included. Patients with a major systemic or ocular surface disease or a history of earlier ocular surgery or trauma were excluded. Best-corrected Snellen visual acuity, intraocular pressure, and details of slit-lamp and fundus examination were recorded before surgery.

We categorized pterygium as grade 1 if <3.5 mm and grade 2 if >3.5 mm in horizontal dimension. Indications for surgery were classified as symptomatic pterygium if causing redness or irritation on more than three occasions per year, visually threatening pterygium if very close to pupillary border, and cosmetic pterygium if small and the patient wanted surgery.

Surgical procedure

All of the patients underwent our standard surgical technique of pterygium excision followed by inferior conjunctival autografting. Three ophthalmologists performed the surgery under retrobulbar block using 3 mL of 2% xylocaine + epinephrine 1:8000 + 1.5 mL of bupivacaine. After painting the lids and periocular area with 5% povidone iodine and draping, a lid speculum was applied. The head of the pterygium was dissected from the cornea using a No 11 blade, and its corpus and underlying Tenon's capsule were trimmed using Westcott scissors up to 5 mm away from the limbus. Subconjunctival fibrous tissue under the pterygium was excised much more widely than the area covered by the pterygium. The rough surface of the corneal bed was dissected with Colibri, and smoothed with a 20-gauge bevel up crescent blade. We took a roughly appropriate-sized graft of bare sclera from the adjacent inferior bulbar conjunctiva after blunt dissection of the conjunctiva without the Tenon's capsule. This graft was rotated over the excised area and sutured with 8/0 Vicryl. The eye was patched and Ocupol-D® (chloramphenicol 10 mg + dexamethasone 1 mg/g) ointment was applied at the end of surgery.

Follow-up visits

After surgery, biomicroscopic examination was performed on the first day, and topical Pyrimon® (chloramphenicol 1% + dexamethasone 0.1%) eye drops were administered as one drop four times a day for the first week and tapered until one month. Patients also received Ocu-Mycin® (chloramphenicol 1%) ointment at bedtime for the first 2 weeks. On postoperative day 7, we removed residual sutures if present with plain forceps and Vannas scissors under topical anesthesia using 4% xylocaine eye drops. If graft swelling was present at week 1 after surgery, suture removal was delayed until disappearance of the swelling. We also examined the patients at months 1, 3, and 6 postoperatively, and evaluated for graft retraction, graft necrosis, suture granuloma, Tenon's cyst, and recurrence. We followed the definition of recurrence as growth of fibrovascular tissue encroaching towards the cornea from the limbus as described by Sebban and Hirst.[19] The main outcome measures were recurrence of pterygium and complications.

Table 1 Demographic and basic characteristics of patients

Average age in years (SD)	43 (7.97)
Age in years (Range)	26–64
Sex (No)	
Male	28
Female	22
Occupation (%)	
Farmers	50
Laborers	34
Others	16
Pterygium (No of eyes)	
Grade 1	32
Grade 2	18
Average size of Pterygium in mm (SD)	3.2 (0.60)

Abbreviations: SD, standard deviation; No, number.

Statistical analysis

Data were entered into SPSS version 12 (SPSS Inc, Chicago, IL), and were expressed as the frequency, percentage, mean, standard deviation, and range, as applicable.

Results

We performed surgery on 58 eyes from 58 patients, but eight patients were lost to follow-up. Hence, in this study, we enrolled only 50 eyes from the 50 patients who completed the six months of follow-up. Demographic and baseline characteristics of the patients are shown in Table 1. Table 2 shows that patients in the younger age groups and those engaged in outdoor occupations had a tendency to recurrence of pterygium. Table 3 shows that most common indication for surgery was symptomatic pterygium.

Postoperative complications are shown in Table 4. Minor complications did occur, but only 4% required resuturing. Recurrence was detected at 3 months after surgery in two eyes (4%). We observed conjunctival scarring at the donor site in four eyes (8%); however, there was no symblepharon formation or restriction of upgaze.

Table 2 Risk factors for recurrence

	No of patients	No of recurrence	Percentage
Age (years)			
<40	14	2	14.28
>40	36	0	0
Gender			
Male	28	1	3.57
Female	22	1	4.54
Occupation			
Outdoor	42	2	4.76
Indoor	8	0	0
Grade			
1	32	1	3.12
2	18	1	5.55

Abbreviation: No, Number.

Table 3 Indications for surgery

Indications for surgery	Frequency	Percentage
Symptomatic	32	64
Vision threatening	4	8
Cosmetic	14	28
Total	50	100

Discussion

Various surgical techniques have been used to treat pterygium. The diversity of techniques reflects the ongoing surgical challenge to devise the best method for treating pterygium. Many studies have been published with conflicting results. Our surgical technique aims to preserve the glaucoma filtration site and, unlike most of the other autoconjunctival techniques, the graft is taken from the inferior conjunctiva.

In our study, most patients were farmers (50%) and laborers (34%) who have to work outside for long periods and are exposed to the hazardous effects of infrared and ultraviolet radiation present in sunlight. These findings are similar to those of most of the published studies.[8,9,20] The indication for surgery in our study was mainly symptomatic pterygium. Nazzulah et al reported a similar indication.[21]

We detected recurrence in two (4%) of 50 eyes treated with inferior autografting in our series. In 1985, Kenyon et al[11] published a report describing conjunctival autografting as a promising technique in the treatment of pterygium. They documented a recurrence rate of 5.3% in the primary pterygium group. Since then, several papers on the success of conjunctival grafting have been published, with varying success rates.[12–18] Possible reasons for the wide variation in success of conjunctival autografting in these studies include case selection bias by different surgeons, varying surgical techniques, and variation in ability on the part of individual surgeons.

Syam et al have described the success of pterygium excision followed by inferior conjunctival autografting at a Sussex hospital in the UK. Surgery was performed by an

Table 4 Postoperative complications

Postoperative complications	No of eyes	Percentage
Wound gap ≥ 0.05 mm	2	4 (required resuturing)
Graft edema	16	32
Retention cyst ≤ 0.05 mm	3	6
Conjunctiva scarring	4	8
Recurrence	2	4

experienced surgeon in 23 patients and by trainees in the remaining four cases. The mean follow-up duration was 27 (range 8–53) months. Recurrence was detected in one eye (3.3%). Conjunctival scarring was found at the donor site in 11 eyes (36.6%). There was no symblepharon formation.[22] Our study showed a recurrence rate of 4% and our findings were similar for minor complications. The conjunctival scarring rate at the donor site was only 8% in our series. This could be due to our short follow-up period.[22] Complications resulting from inferior conjunctival autografting are not serious and pose no threat to vision.

There has been a similar paper published by Kim et al. The procedure was performed by making a flap of the inferior conjunctiva after excision of the pterygium, and transposing it to make a covering for the bare sclera and donor site as a barrier to pterygium tissue. This method was used in 54 eyes from 50 patients of mean age 47 (range 18–69) years with primary pterygium. During a mean follow-up period of 20 (range 12–26) months, the pterygium recurred in three (5.6%) of the 54 eyes. The authors concluded that the inferior conjunctival transposition flap is a promising technique for treatment of primary pterygium.[23] Although our report shows a slightly better outcome in terms of recurrence than that report, we would need a more prolonged follow-up period to make a meaningful comparison of the results of these two studies.

Koc et al[24] demonstrated that autografting from superior or inferior sites in primary pterygium cases showed no significant difference in recurrence rate, but in the event of recurrent pterygia, autografting from the inferior site resulted in a significantly ($P = 0.166$) higher likelihood of recurrence.

Sebban and Hirst[19] reviewed 161 known pterygium recurrences to determine when these recurrences occurred. Their analysis of survival curves showed that there was a 50% chance of recurrence within the first 120 days and a 97% chance that there would be a recurrence by 12 months after surgery. In contrast with these findings, Ti et al[25] reported that most recurrences following conjunctival autografting tend to occur within 6 months of surgery. Generally, recurrences of pterygium also occur during the first 6 months after surgery as observed by Adamis et al.[26] Our study has the shortcoming of a follow-up period of only 6 months. A larger-scale, longer-term study will be needed to identify the optimal follow-up period.

Guler et al reported a recurrence rate of 13.3% in patients under 40 years of age who were followed up after autograft transplantation.[27] In contrast, the recurrence rate was reported to be highest (at 42.3%) in the 40–50-year age group in another series, with no statistically significant difference between groups younger or older than 40 years.[28] Our study shows a tendency for pterygium recurrence in the younger age groups. There was a tendency for recurrence in patients younger than 40 years, but this was not statistically significant. Because this technique is safe and effective, inferior conjunctival autografting deserves better recognition.

Conclusion

Inferior conjunctival autografting is an effective technique with a low recurrence rate. It is a useful technique when it is not possible or desirable to use the superior conjunctiva as a donor source. In countries like Nepal where there is a lack of public awareness about the devastating effects of glaucoma, attendance and regular follow-up in the early stages of the disease at eye centers is very unlikely. Patients may have glaucoma and pterygium together, and surgeons may miss glaucoma in the early stages. It is also true that patients with glaucoma usually present to hospital at a late stage, when glaucoma filtration may be the only option, and even when the patient presents early on, they may need glaucoma surgery if medical therapy is unsuccessful. We can use the inferior bulbar conjunctiva safely and effectively for grafting in pterygium surgery as a surgical alternative for preserving the glaucoma filtration site in the future. We recommend further investigations in larger numbers of patients and for longer periods of follow-up to make this surgical method universally applicable.

Disclosure

The authors report no conflicts of interest in this work.

References

1. Higgers JHC. Pterygium: its incidence, hereditary and etiology. *Am J Ophthalmol*. 1960;50:653–644.
2. Panchapakesan J, Hourihan F, Mitchell P. Prevalence of pterygium and pinguecula: a Blue Mountains Eye Study. *Aust N Z J Ophthalmol*. 1998;26 Suppl 1:S2–S5.
3. Ma K, Xu L, Jie Y, Josan JB. Prevalence of and factors associated with pterygium in adult Chinese: Beijing Eye Study. *Cornea*. 2007;26: 1184–1186.
4. Fotouhi A, Hashemi H, Khabazkhoob M. Prevalence and risk factors for pterygium and pinguecula: the Tehran Eye Study. *Eye (Lond)*. 2009;23:1125–1129.
5. Durkin SR, Abhary S, Newland HS, Selva D, Aung T, Casson RJ. The prevalence, severity and risk factors for pterygium in central Myanmar: the Meiktila Eye Study. *Br J Ophthalmology*. 2008;92:25–29.
6. Austin P, Jakobiec FA, Iwamoto T. Elastodysplasia and elastodystrophy as pathologic bases of ocular pterygium and pinguecula. *Ophthalmology*. 1983;90:96–109.
7. Kunimoto DY, Kanitkar KD, Makar M, Friedberg M. Pterygium/pinguecula. In: *The Wills Eye Manual: Office and Emergency Room Diagnosis and Treatment of Eye Disease*. 4th ed. Philadelphia, PA: Lippincott Williams and Wilkins; 2004.
8. Moran DJ, Hollows FC. Pterygium and ultraviolet radiation: a positive correlation. *Br J Ophthalmol*. 1984;68:343–346.
9. Yanoff M, Duker JS. Conjunctival and corneal degenerations. *Ophthalmology*. 2004;1:446–447.

10. Prabhasawat P, Barton K, Burkett G, Tseng SC. Comparison of conjunctival autografts, amniotic membrane grafts, and primary closure for pterygium excision. *Ophthalmology*. 1997;104:974–985.
11. Kenyon KR, Wagoner MD, Hettinger ME. Conjunctival autograft transplantation for advanced and recurrent pterygium. *Ophthalmology*. 1985;92:1461–1470.
12. Ma DH, See LC, Liau SB, Tsai RJ. Amniotic membrane graft for primary pterygium: comparison with conjunctival autograft and topical mitomycin C treatment. *Br J Ophthalmol*. 2000;84:973–978.
13. Tananuvat N, Martin T. The results of amniotic membrane transplantation for primary pterygium compared with conjunctival autograft. *Cornea*. 2004;23:458–463.
14. Elmas K, Katırcıoğlu Y, Aslan B, Duman S. Primary pterygium excision, amniotic membrane graft, conjunctival autograft and primary closure techniques comparisons. *T Oft Gaz*. 2002;32:337–342.
15. Ozkurt YB, Kocams O, Comez AT, Uslu B, Dogan OK. Treatment of primary pterygium. *Optom Vis Sci*. 2009;86:1178–1181.
16. Rao SK, Lekha T, Mukesh BN, Sitalakshmi G, Padmanabhan P. Conjunctival-limbal autografts for primary and recurrent pterygia: technique and results. *Indian J Ophthalmol*. 1998;46:203–209.
17. Shimazaki J, Yang HY, Tsubota K. Limbal autograft transplantation for recurrent and advanced pterygia. *Ophthalmic Surg Lasers*. 1996; 27:917–923.
18. Lewallen S. A randomized trial of conjunctival auto grafting for pterygium in the tropics. *Ophthalmology*. 1989;96:1612–1614.
19. Sebban A, Hirst LW. Pterygium recurrence rate at The Princess Alexandra Hospital. *Aust N Z J Ophthalmol*. 1991;19:203–206.
20. Threlfall TJ, English DR. Sun exposure and pterygium of the eye: a dose-response curve. *Am J Ophthalmol*. 1999;128:280–287.
21. Nazzulah, Akbar Shah, Mustaque Ahmed, Abdul Baseer, Shafquatullah Khan Marwat, Nasir Saeed. Recurrence rate of pterygium: a comparison of bare sclera and free conjunctival autograft. *J Med Sci*. 2010; 18:36–39
22. Syam PP, Eleftheriadis H, Liu CS. Inferior conjunctival auto graft for primary pterygia. *Ophthalmology*. 2003;110:806–810.
23. Kim S, Yang Y, Kim J. Primary pterygium surgery using the inferior conjunctival transposition flap. *Ophthalmic Surg Lasers*. 1998;29: 608–611.
24. Koc F, Demirbay P, Teke MY, et al. Primary and recurrent pterygium conjunctival autografting. *T Oft Gaz*. 2002;32:583–588.
25. Ti SE, Chee SP, Dear KB, Tan DT. Analysis of variation in success rates in conjunctival auto grafting for primary and recurrent pterygium. *Br J Ophthalmol*. 2000;84:385–389.
26. Adamis AP, Starck T, Kenyon KR. The management of pterygium. *Ophthalmol Clin North Am*. 1990;3:611–623.
27. Guler M, Sobacı G, İlker S. Limbal-conjunctival autograft transplantation in cases with recurrent pterygium. *Acta Ophthalmol*. 1994;72: 721–726.
28. Alpay A, Uğurbaş SH, Erdoğan B. Comparing techniques for pterygium surgery. *Clin Ophthalmol*. 2009;3:69–74.