

Pterygium excision and conjunctival mini-autograft: preliminary report

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Abstract

Purpose Pterygium excision is often followed by recurrence that may be more severe than the initial lesion. This study evaluated the efficacy of conjunctival mini-autograft following surgical excision of pterygium.

Methods Eight patients underwent pterygium excision with a conjunctival mini-autograft. All patients had decreased visual acuity secondary to involvement of the central cornea by the pterygium. Following the excision, dissection of a conjunctival mini-autograft was performed. The mini-autograft was then transposed to the area of excision and secured in place with interrupted Vicryl and a few nylon sutures. Follow-up periods ranged from 5 to 9 years.

Results All eyes healed with no post-operative complications and no recurrences of the pterygium in any patient up to a maximum follow-up period of 9 years 10 months.

Conclusion Conjunctival mini-autograft with excision of the pterygium is an effective procedure for the surgical management of pterygium.

Key words Conjunctiva, Excision, Mini-autograft, Pterygium

Pterygia, which are triangular, fibrovascular connective tissue overgrowths of bulbar conjunctiva onto the cornea, are horizontally located in the interpalpebral fissure on either the nasal or the temporal side of the cornea.¹ In the early stages, a pterygium might be difficult to distinguish from a pinguecula, but as the pterygium advances onto the cornea the diagnosis becomes obvious. Pterygium, a degenerative lesion, is thought to be causally related to long durations of actinic exposure.^{2,3} Further, a statistically significant association between chronic ultraviolet light (UVA and UVB) irradiation and pterygium development has been reported.⁴

An immunopathological mechanism was recently suggested to play a role in the pathogenesis of pterygium.⁵ Aberrant HLA-DR

antigen expression in epithelial cells was detected in 30 of 35 cases of pterygium.⁵ HLA-DR antigen expression in pterygium was found to be closely related to the density of T4 cells and especially CD4 lymphocytes.⁵ Additionally, an increased number of mast cells has been noted in pterygium specimens compared with controls.⁶ Mast cell proliferation and activation is thought to contribute to the pathogenesis of pterygium formation.⁶

Unlike pseudopterygium, a true pterygium is found only in the interpalpebral fissure, has recognisable parts, and adheres to the limbus.⁷ Biomicroscopy may reveal the presence of a pigmented iron line (Stocker line) on the cornea.

Pterygium excision is often followed by a recurrence that may be more severe than the initial lesion. The present study evaluated the efficacy of a conjunctival mini-autograft following surgical excision of a pterygium. This is the first report of the use of conjunctival mini-autograft in the surgical treatment of pterygium.

Patients and methods

Eight patients (7 men, 1 woman) ranging in age from 52 to 70 years (average 59.25 years) underwent pterygium excision with a conjunctival mini-autograft. Five pterygia were primary, and three were recurrent. Of the latter, one patient had undergone one previous surgery for pterygium, one patient had had two previous surgeries, and the last patient had had three previous surgeries. One patient had diplopia. None of these three patients had a previous conjunctival autograft or received mitomycin therapy. All patients had decreased visual acuity secondary to involvement of the central cornea by the pterygium. Patients with pseudopterygia were excluded from this study.

The surgical excision extended to 3 mm from the limbus horizontally. The area to be excised was measured by calipers, marked by spot cautery, and highlighted with methylene blue (Fig. 1). Dissection was carried out to the bare sclera and the bleeders were cauterized (Fig. 2, top left and right). The excised margins were sutured to the sclera using interrupted 9-0

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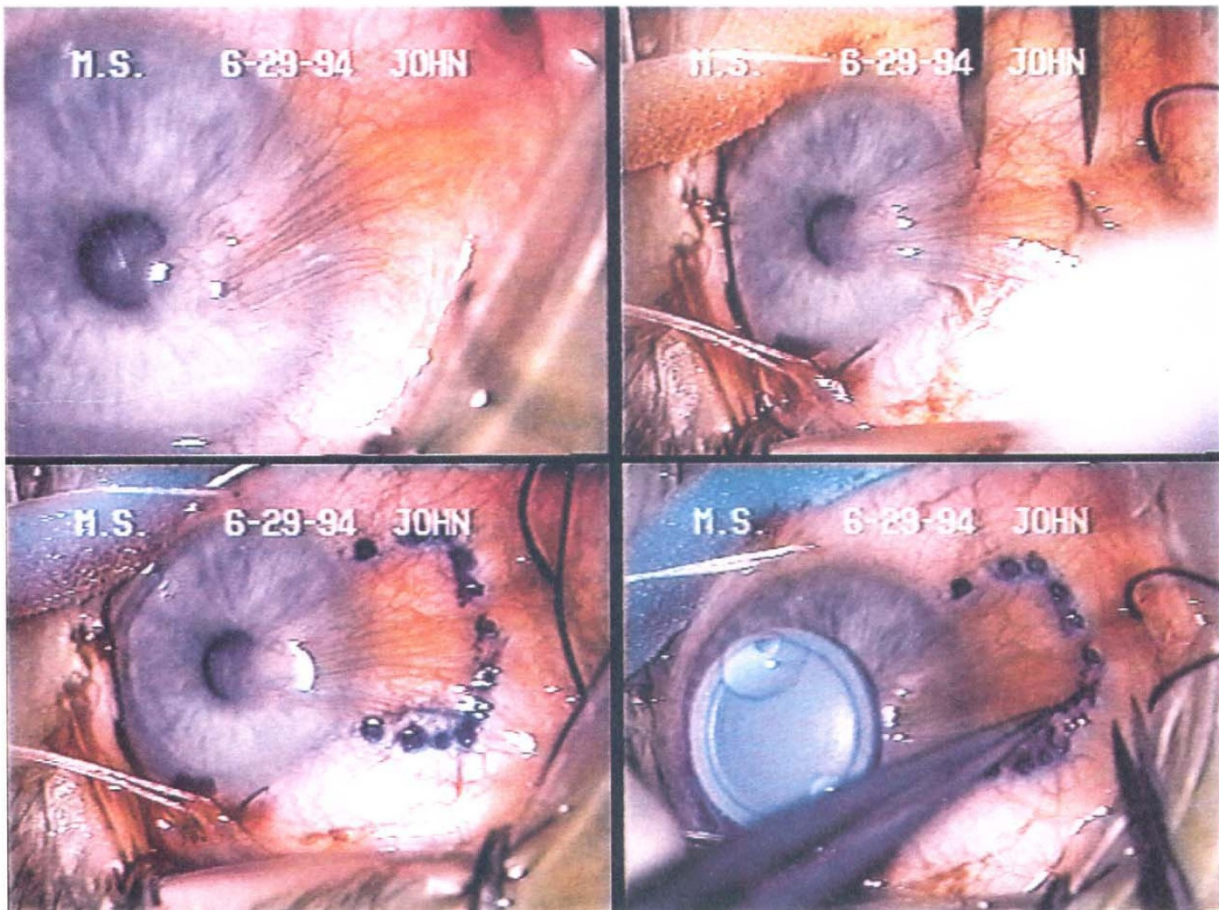


Fig. 1. Top left: Intraoperative photograph showing a primary pterygium involving the central cornea. The area to be excised is measured with calipers (3 mm from limbus) (top right), marked by spot cautery, and highlighted with methylene blue (bottom left and right).

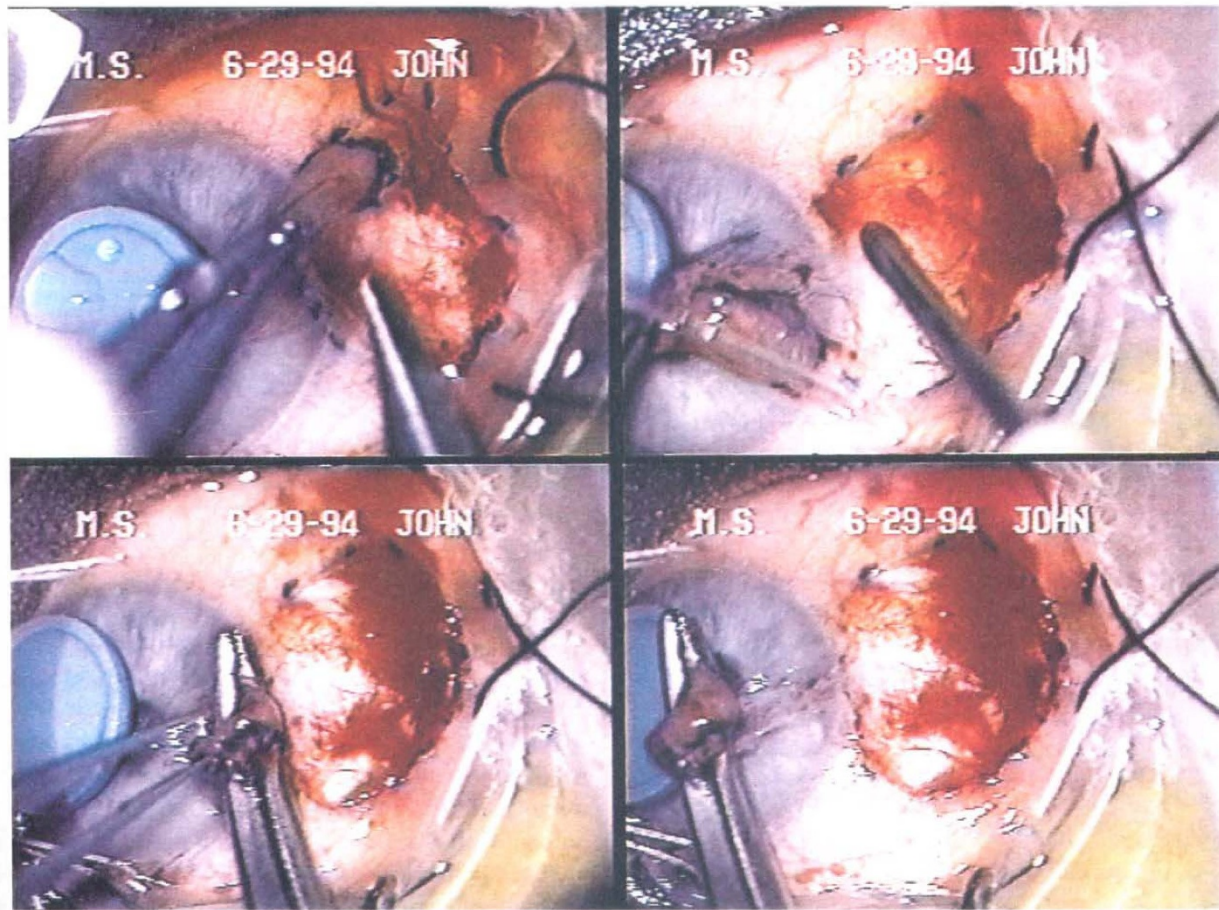


Fig. 2. Top left: The pterygium is dissected to the bare sclera. Top right: The bleeders are cauterized. Bottom left: The pterygium is held with a haemostat at the limbus and (bottom right) peeled off the corneal surface.

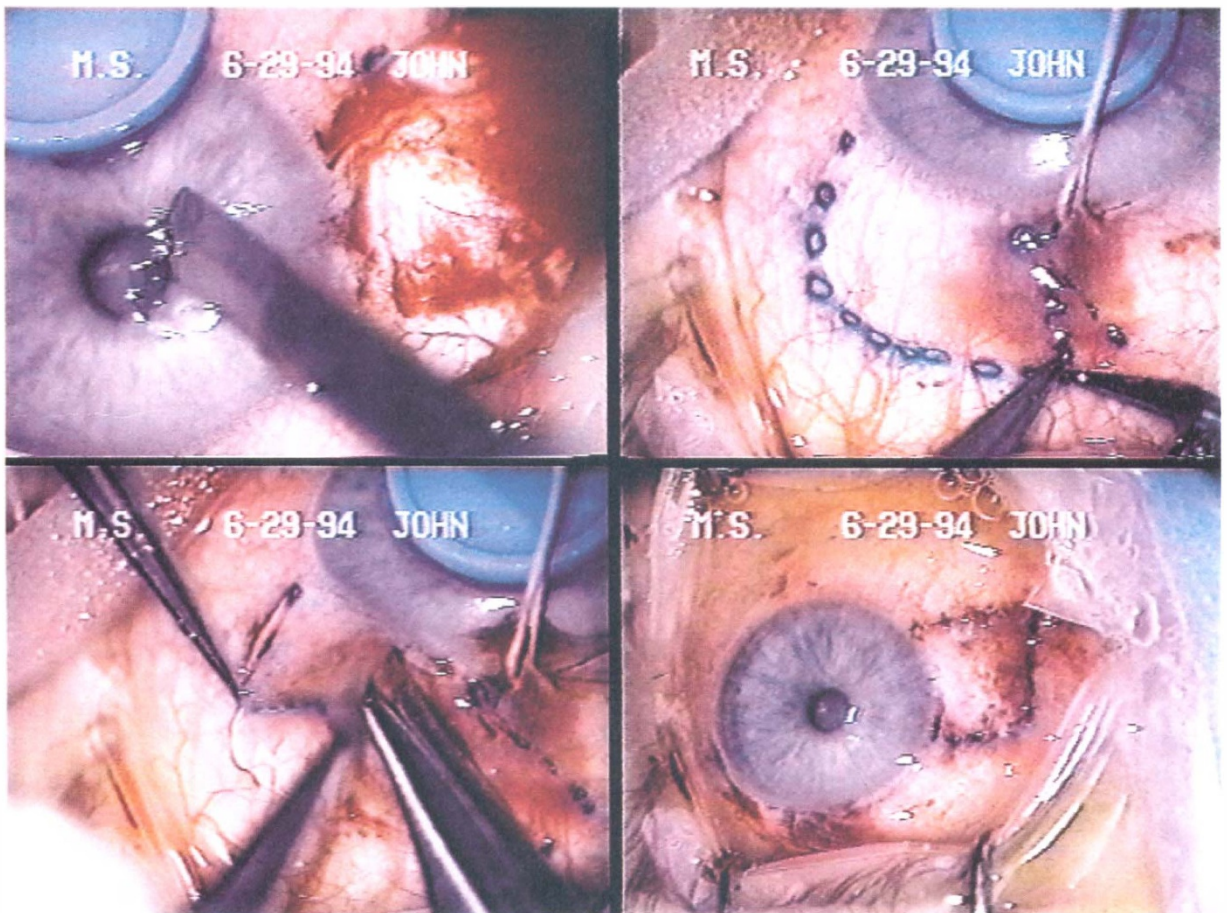


Fig. 3. Top left: The corneal and limbal surfaces are smoothed using a straight crescent blade. Top right: The donor conjunctival graft is marked and highlighted with methylene blue. Top right and bottom left: The donor conjunctival graft is dissected as a single sheet. Bottom right: The mini-autograft is oriented such that the limbal conjunctiva is placed at the limbus.

Vicryl sutures. The pterygium was held with a haemostat and then peeled off the corneal surface in one smooth motion (Fig. 2, bottom left and right). The corneal and limbal surfaces were smoothed using a straight crescent blade (Fig. 3, top left). A 1 mm oversized (4 mm from limbus) donor conjunctival graft then was dissected as a single sheet and transposed to the area of the bare sclera nasally (Fig. 3, top right, bottom left and right). It is important not to buttonhole the donor conjunctival graft. This graft was oriented such that the nasal limbal conjunctiva was located at the limbus (Fig. 3, bottom right). The mini-autograft then was sutured with multiple interrupted 9-0 Vicryl sutures with a BV100-3 needle. A few 10-nylon interrupted sutures were used to suture the graft at the limbus (Fig. 3, bottom right). Topical antibiotic-steroid ointment was applied and the eye was patched.

The follow-up periods ranged from 5 to 9 years, with an average follow-up of 7.2 years.

Results

Following pterygium excision with a conjunctival mini-autograft, all eyes healed without the occurrence of any post-operative complications. There was no recurrence of pterygium in any of the eight patients (Table 1).

Discussion

Pterygium excision can be a management problem, especially because it might be followed by a recurrence that is worse than the original lesion. The decision to surgically excise the pterygium is dependent on multiple factors, such as central corneal involvement with decreased visual acuity, restriction of extraocular movement with diplopia, and the desire to improve the cosmetic appearance. These lesions can become inflamed, which may require medical treatment. The patients may experience redness and photophobia and may require administration of mild topical steroids, vasoconstrictors and preservative-free ocular lubricants. Some physicians recommend the use of ultraviolet spectacles.

Surgical management of pterygium includes bare sclera excision, beheading the pterygium,⁸ excision with post-operative beta-radiation,^{9,10} treatment with triethylene thiophosphoramidate,¹¹ ruthenium irradiation,¹² intraoperative¹³⁻¹⁵ and post-operative mitomycin,¹⁶⁻¹⁹ limbal conjunctival autograft,²⁰⁻²³ autograft using a template,²⁴ sliding conjunctival flap,²⁵ pedicle conjunctival strip,²⁶ tissue adhesive,²⁷ argon laser photocoagulation,²⁸ sclerokeratoplasty,²⁹ deep lamellar keratoplasty on air with lyophilised tissue³⁰ and excimer

Table 1. Pterygium excision and conjunctival mini-autograft: patient demographics and follow-up

Case no.	Age (years)	Sex	Primary pterygium	Recurrent pterygium	Eye	Date of surgery	Follow-up	Recurrence	Comments
1	65	F	Yes		OD	10 June 1992	8 years 3 months	No	Pterygium involving visual axis, blurred vision for 4 years
2	62	M		Yes	OS	11 May 1994	6 years 4 months	No	Previous pterygium excision on 8 Dec. 1993
3	57	M		Yes	OS	17 Sept. 1992	8 years	No	First surgery 1986; second surgery 1998; diplopia on lateral gaze
4	46	M	Yes		OS	7 Sept. 1994	6 years	No	Blurred vision secondary to pterygium
5	70	M	Yes		OS	20 Aug. 1994	6 years 1 month	No	Pterygium involving visual axis, blurred vision and glare
6	52	M		Yes	OD	8 July 1992	8 years 2 months	No	Had three previous pterygium excisions
7	67	M	Yes		OD	28 Nov. 1990	9 years 10 months	No	Progressive pterygium
8	55	M	Yes		OS	2 June 1995	5 years 3 months	No	Pterygium causing blurred vision

Pt., patient, OD, right eye; OS, left eye; F, female; M, male.

laser treatment.³¹ The present report describes the surgical steps involved in pterygium excision with a conjunctival mini-autograft.

The primary drawback to surgical management of pterygium has been the high recurrence rate of this lesion.^{32,33} Kenyon and others popularised conjunctival autograft following pterygium excision.^{34,35} The use of conjunctival autograft with pterygium excision was associated with a lower recurrence rate of approximately 5%.³⁴ In the present preliminary report, there was no recurrence of pterygium following excision with a conjunctival mini-autograft. Because the area of excision is only 3 mm from the limbus, healing progresses much faster with this mini-autograft compared with the conventional autograft. In addition, there is no need to work over the area of the medial rectus muscle when one is using the mini-autograft, which eliminates any potential surgical complication involving the muscle.

With other surgical techniques several complications have been reported in the literature.³⁶⁻⁴⁴ Some of the more serious complications include bacterial^{45,46} and fungal infections,^{37,41,45} and surgically induced necrotising scleritis after pterygium surgery.³⁸ In the present study, no complications occurred in any of the eight cases during the follow-up period of 5-9 years.

More recently, amniotic membrane transplantation has been used with pterygium excision.^{47,48} However, with this technique, one needs to obtain amniotic membrane to cover the area of the bare sclera where the pterygium was excised. In contrast, with the mini-autograft, the patient's own conjunctiva is used and hence there is no need to obtain amniotic membrane,

which decreases the surgical cost of the procedure. Also, mini-autograft can be performed in areas where amniotic membrane is not readily available.

Pterygium excision with conjunctival mini-autograft appears to be an effective procedure to prevent recurrence of pterygium after excision. To the best of my knowledge, this is the first report of the use of conjunctival mini-autograft in the surgical management of pterygium.

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