

Evaluation of the recurrence rate for pterygium treated with conjunctival autograft

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Abstract

Purpose The aim of this study was to evaluate the recurrence rate for the conjunctival autografts in the treatment of primary pterygium.

Methods Thirty-six eyes of 36 patients with the diagnosis of primary pterygium underwent surgical excision and were treated with conjunctival autografts. Complications, recurrence rate, and final appearance of the cases were evaluated prospectively.

Results Complications were observed in five cases; three eyes with Dellen ulcer and two cases with a Tenon's cyst in the superior temporal quadrant. Recurrence was detected in three cases in the study group. The onset of recurrence was 4.5 months. Higher complication rates were detected among the patient group below 54 years old than in the patient group aged 54 years or over, 22.2 % vs 5.6 % respectively ($p=0.338$). Complications were more frequent among male patients than among female patients, 22.2 % vs 5.6 % respectively ($p=0.338$). Recurrence was detected in four cases (8 %), with an average recurrence time of 4.5 months.

Conclusion We suggest that conjunctival autografting is an effective technique in primary pterygium in terms of low recurrence rate. Increasing patient age is associated with significantly less risk of recurrence and complication.

Keywords Pterygium · Conjunctival autograft · Tenon's cyst · Dellen ulcer

Introduction

Pterygium is a degenerative benign ocular surface disorder with a wing-shaped fibrovascular conjunctival growth, predominantly located on the nasal site of the eye commonly seen in light-skinned people living nearer the equator, particularly where outdoor activities are popular. Risk factors strongly associated with the development of pterygium is exposure to ultraviolet light (UVB), wind, dust and heat, dryness, oncogenes, and viruses. Destruction of the Bowman's layer by fibrovascular growth revealed mild inflammatory changes in the cornea and conjunctiva [1–7]. An increased density of Langerhans cells was observed in pterygium, reflecting a higher level of antigenic and mitogenic exposure in the conjunctiva, although the significance of these phenomena in the recurrence and pathogenesis of pterygium remains unclear and merits further studies [8]. An increased p53 expression in the limbal epithelium of pterygia, limbal tumors, and most pingueculae was detected previously, indicating that the probable existence of p53 mutations in these cells as an early event in their development, which is consistent with their causation by UV radiation [5, 9]. As a result of several factors causing surface disorder, pterygium enlarges, replaces the corneal epithelium, and erodes the Bowman's membrane and the anterior corneal stromal lamellae beneath it [5]. Symptoms of pterygium include persistent redness, inflammation, foreign body sensation, tearing, which can cause bleeding, dry, and itchy eyes. In advanced cases, the pterygium can affect vision as it invades the cornea, with the potential of obscuring the optical center of the cornea and inducing astigmatism and corneal scarring [5].

The study was a part of our routine work in Ahi Evran University Research and Teaching Hospital, Ophthalmology Department, Kirsehir, Turkey.

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The main method for treating a pterygium is by surgical excision [2, 10]. Various techniques such as adjuvant Mitomycin C or beta radiation after bare scleral excision or closure of the bare area with conjunctival autograft or amniotic membrane have been developed [4, 11, 12]. Although an optimal pterygium surgery has to be free of complication, safe, with good cosmetic results and a low recurrence rate, most procedures have high rates of postoperative recurrence. The most highest recurrence rate has been reported for bare scleral excision technique up to 88 % [13, 14]. Mitomycin C is the most commonly used cytotoxic agent to decrease the recurrence rate with the reported rates of 4 % to 22 % [15]. However, serious complications such as corneal perforation, glaucoma, corneal edema, cataract, scleral ulceration, necrosis, and iritis due to mitomycin C have been reported. Conjunctival autografting has been shown to be the best technique, with low recurrence and complications rates, and is usually reserved for patients with recurrence or advanced disease to preserve the remaining healthy conjunctiva compared to amniotic membrane transplantation [10, 16].

In this prospective study, we aimed to evaluate the recurrence rate for pterygium cases treated with conjunctival autografting.

Material and methods

Study group

We performed simple pterygium excision followed by conjunctival autografting in 36 eyes of 36 patients with primary pterygium at Ahi Evran University, Training and Research Hospital, Eye Clinic from 2009 to 2012. An informed consent for the surgery were signed by all patients in this study. Thirty-six eyes of 18 female and 18 male patients (age range, 33–78 years; mean 54.19±11.64 years) were enrolled in this study. Recurrent pterygium cases were excluded. The size of pterygium cases varied from 2 mm to 5.2 mm (mean 3.16 mm±0.78 mm) and follow-up time was 10.4±3.74 months (range, 5–18 months).

Surgical method

Surgery was performed under local anesthesia. After the insertion of the lid speculum, 2 % lidocain HCl was injected into the body of the pterygium, and the head was dissected from the cornea with a no. 11 blade and its corpus was trimmed up to 5 mm away from the limbus. Subconjunctival fibrous tissue under the pterygium was excised much more widely than the area the pterygium covered; for example, for the nasal pterygium, subconjunctival excision extended to the superior and inferior fornices and to the nasal caruncle. Minimal

cauterization was applied to the exposed episcleral vessels. For conjunctival autografts, a conjunctival free graft of similar size was obtained from the superotemporal bulbar conjunctiva by splitting at the anatomic limbus. Care was taken not to have Tenon's tissue in the autograft. The limbal side of the autograft was sutured to the limbal side of the recipient bed by separate 8/0 vicryl sutures. Postoperatively, all the patients received dexamethasone and tobramycine drops four times a day. Tobramycine was ceased at the second week, and steroid drop was ceased at the fourth week postoperatively. No suture removal was performed in any case. Patients were examined at first week, first, third, sixth, ninth months, and first year postoperatively, in this observational study.

Statistical analyses Data were analysed using SPSS software 15.0 (SPSS, Inc., Chicago, IL, USA). Comparisons for categorical variables were done using χ^2 tests, although Fisher's exact test was used when data were sparse. Significance was set at $p < 0.05$ using two-sided comparisons.

Results

Thirty-six eyes of 18 female and 18 male patients (age range, 33–78 years; mean 54.19±11.64 years) underwent surgeries performed by a single surgeon. Thirty-two of 36 cases (88.9 %) were successful in surgery. Average age, follow-up time, pterygium size, recurrence time, and the statistical data of the cases were evaluated. The size of pterygium cases varied from 2 mm to 5.2 mm (mean 3.16 mm±0.78 mm), and follow-up time was 10.4±3.74 months (range, 5–18 months). Three cases of Dellen ulcer and two case of Tenon's cyst were observed in the first postoperative week. Dellen cases were treated medically, and Tenon's cyst was excised surgically. According to the mean age of the cases,

Table 1 The recurrence rates of different surgical techniques in previous studies

Reference	Recurrence rate (%)			
	Conjunctival autografting	Amniotic membrane grafting	Mit-C	Primary closure (bare sclera)
Prabhasawat et al. [11]	2.6	10.9		45
Kenyon et al. [17]	5.3			
Ma et al. [18]	5.4	3.8	3.7	
Ozkurt et al. [19]	8	41.66		
Elmas et al. [26]	7.3	6.2		16.6
Chen et al. [13]	39		38	
This study	8			

complication rates were compared. Higher complication rates were detected among the patient group below 54 years old than in the patient group aged 54 years or over, 22.2 % vs 5.6 % respectively ($p=0.338$). Additionally, complications were more frequent among male patients than female patients, 22.2 % vs 5.6 % respectively ($p=0.338$). Recurrence was detected in four cases (8 %), with an average recurrence time of 4.5 months. No further surgery was performed in recurrence cases. Recurrence rates were higher among patients below 54 years old than in patients aged 54 years or over, 16.7 % vs 5.6 % respectively ($p=0.603$). Additionally, complications were more frequent among male patients than female patients, 16.6 % vs 5.6 % respectively ($p=0.603$). Recurrences were most seen in the first 11 months for the cases.

Recurrences were more frequently observed among cases with pterygium size above 3.16 mm than the smaller cases, 15.4 % vs 8.7 % respectively (OR=1.909; 95 % CI=0.236–15.455; $p=0.609$). As for evaluating complication rates by lesion size, larger cases were found to be have a higher risk for complication occurrence than smaller cases; 15.4 % vs 13 % respectively (OR=1.212; 95 % CI=0.175–8.389; $p=1.000$).

Discussion

The main method for treating a pterygium is by surgical excision [2, 4, 10–12], but the major concern is that most procedures have high rates of postoperative recurrence, with the highest rates for bare scleral excision technique up to 88 % [13, 14]. The conjunctival autografting technique, first performed by Kenyon et al. [17] in 1985, has been shown to be the best technique, with low recurrence rate and complication rates [10, 16]. The rates for recurrence of different surgical procedures reported in previous studies are shown in Table 1 [11, 13, 17–19]. Recurrence rates have been reported to be between 2.6 and 39 % with the conjunctival autograft technique [11, 17–19]. When primary and recurrent pterygium cases are examined separately, recurrence rates are found to be between 2.9 and 39 % [13, 20–23] in the primary pterygium group and between 15.6 and 31.2 % in the recurrent pterygium group [21, 23]. In a study by Chen et al. [13], conjunctival autograft and low-dose topical mitomycin C were found to be equally effective after excision of primary pterygia, and both methods have significantly lower rates of recurrence, 39 % and 38 % respectively. In this study, the lower recurrence rate was detected as 8 % for the conjunctival autograft method.

Recurrence rate has been found to be higher in patients younger than 50 years (50 %) than in patients aged 50 years or over (22 %) [13]. Similarly to the reports published previously, increasing patient age is associated with lower risk of

recurrence in this study. Recurrence rates were higher among patients aged below 54 years than in patients aged 54 years and over, 16.7 % vs 5.6 % respectively ($p=0.603$). The mean time for recurrence was mostly in the first 11 months for these cases. Several studies have shown that recurrences were mostly seen in the first 3 to 6 months, and 97 % in the first year [13, 18, 22].

Variation in the recurrence rates of conjunctival autograft could be explained with the size of surgical excision, surgeon's experience, patient's age, and surgical technique. As for surgical technique, incomplete separation of Tenon's tissue from the graft will cause graft retraction and high recurrence rates up to 77 % [13]. Low recurrence rate in this study could be explained by the small size of the grafts, with a mean size of 3.16 mm.

In some studies, higher recurrence rates of 15–39 % for conjunctival autografting have been reported [24, 25], probably due to younger patient age or inappropriate graft sizes. In the conjunctival autograft technique, recurrence time has been reported to be between the first 3 to 9 months postoperatively [26]. In this study, recurrence was detected in four cases (8 %), with an average recurrence time of 4.5 months.

Graft edema, necrosis of the graft, subconjunctival hematoma, inclusion cysts, Tenon's granulomas, and Dellen ulcers have been reported to be the most common postoperative complications of conjunctival autografting [17, 27]. In this study, three cases of Dellen ulcer and two cases of Tenon's cyst were observed in the first postoperative week.

Recently, new methods such as combined subpterygial bevacizumab injection, a novel monoclonal antibody against vascular endothelial growth factor, and pterygial ligation have been developed, to prevent recurrence. This procedure has been suggested to be an effective procedure for the removal of pterygium [28] in some reports, and results indicating its usefulness have also been reported [29]

In conclusion, an ideal pterygium surgical procedure should be safe, with good cosmetic results, as well as with low recurrence rate. Our results suggest that conjunctival autografting is an effective method in primary pterygium cases with low recurrence and complication rates.

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