The Use of Fibrin Glue in Primary and Recurrent Pterygium Surgery

Primer ve Rekürren Pterjium Cerrahisinde Fibrin Doku Yapıştırıcısının Kullanımı

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Geliş Tarihi/*Received:* 30.07.2015
Kabul Tarihi/*Accepted:* 22.10.2015

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ABSTRACT Objective: To evaluate and compare postoperative visual outcomes, complications and recurrence rates between patients with primary and recurrent pterygium operated by means of conjunctival autograft technique with fibrin glue. **Material and Methods:** Between March 2010 and May 2011, 72 eyes of 52 patients, [24 males (46%), 28 females (54%)], who had undergone pterygium operation with conjunctival autograft technique with fibrin glue were included in this study. Their medical records were examined retrospectively. Their mean age was 45.98±12.60 standard deviation (SD) (range 21-69) years. Thirty two of them (61%) had unilateral and 20 of them (39%) had bilateral pterygium. Twenty seven patients (52%) had primary (group 1) and 25 patients (48%) had recurrent pterygium (group 2). **Results:** The mean age was significantly lower in the second group (p=0.00). In terms of sex and laterality, there was no significant difference between two groups (p=0.680, p=0.270). The mean operation duration was significantly longer in the second group (p=0.042). The mean preoperative and postoperative best corrected visual acuities were not significantly different between the groups (p=0.573, p=0.110). In terms of postoperative complications and recurrence, there was no significant difference between two groups (p=0.530, p=0.905). **Conclusion:** The use of fibrin glue for attachment of conjunctival autografts is a safe technique and has low complication and recurrence rates. In recurrent pterygium group, the mean age was significantly lower and the mean operation duration was significantly longer. Complication and recurrence rates were low in both primary and recurrent pterygium groups and there was no significant difference between two groups.

Key Words: Pterygium; recurrence; conjunctiva; fibrin tissue adhesive

ÖZET Amaç: Konjonktival otogreft tekniğiyle fibrin doku yapıştırıcısı kullanılarak ameliyat edilen primer ve rekürren pterjiumlu hastaların ameliyat sonrası görme keskinliği, komplikasyon ve nüks oranlarının değerlendirilmesi ve kıyaslanması. **Gereç ve Yöntemler:** Mart 2010 ile Mayıs 2011 arasında konjonktival otogreft tekniğiyle fibrin doku yapıştırıcısı kullanılarak ameliyat edilen primer ve rekürren pterjiumu olan, 24'ü erkek (%46), 28'i kadın (%54), toplam 52 hastanın 72 gözü çalışmaya dahil edildi. Tıbbi kayıtları retrospektif olarak incelendi. Ortalama yaşları 45,98±12,60 standart deviasyon (SD) (21-69) arası yıl idi. Otuz iki hastanın (%61) tek taraflı, 20 hastanın ise (%39) bilateral pterjiumu vardı. Yirmi yedi hastanın (%52) primer (1. grup), 25 hastanın ise (%48) rekürren pterjiumu (2. grup) vardı. **Bulgular:** İkinci grubun ortalama yaşı anlamlı olarak daha düşüktü (p=0,00). Cinsiyet ve lateralite açısından iki grup arasında anlamlı bir farklılık yoktu (p=0,680, p=0,270). İkinci grupta ortalama ameliyat süresi anlamlı olarak daha uzundu (p=0,042). Ameliyat öncesi ve ameliyat sonrası en iyi düzeltilmiş görme keskinliği açısından iki grup arasında anlamlı bir farklılık yoktu (p=0,573, p=0,110). Ameliyat sonrası komplikasyon ve nüks açısından da iki grup arasında anlamlı bir farklılık saptanmadı (p=0,530, p=0,905). **Sonuç:** Fibrin doku yapıştırıcısıyla konjonktival otogreftin yapıştırılması güvenli bir tekniktir, komplikasyon ve nüks oranı düşüktür. Rekürren pterjium grubunda ortalama yaş anlamlı olarak daha düşüktü ve ortalama ameliyat süresi anlamlı olarak daha uzundu. Komplikasyon ve nüks oranları hem primer hem de rekürren pterjium gruplarında düşüktü ve iki grup arasında bu açıdan anlamlı bir farklılık yoktu.

Anahtar Kelimeler: Piterjium; nüks; konjonktiva; fibrin doku yapıştırıcısı

doi: 10.5336/ophthal.2015-47371

Turkiye Klinikleri J Ophthalmol 2016;25(1):46-50

Pterygium is a degenerative disease which is characterized by invasion of cornea by fibrovascular conjunctival tissue. Its location is mostly nasal. Its etiology is not known exactly, but ultra viole(UV) lights, climate and genetic structure are important factors.[1-3] It causes cosmetic complaints, chronic irritation, astigmatism and impaired vision.

Standard treatment method is surgical excision, but the major problem is the recurrence of pterygium. There are many surgical methods, including bare sclera, amnion membrane transplantation, rotational flap and conjunctival autograft techniques. Radiation therapy, usage of antimetabolites and antineoplastic agents are succesful in reducing the recurrence rates, but they may cause serious complications such as secondary glaucoma, cataract, uveitis, scleral necrosis and perforation.[4]

Currently preferred surgical technique for pterygium is excision with conjunctival autograft transplantation.[5] This method is safe and effective and has low recurrence rates.[6,7] Attachment of conjunctival autograft may be done either with suturing or by using fibrin tissue glue. Suturing may cause some complications like ocular irritation, granuloma, abscess, necrosis and giant papillary conjunctivitis. However, the use of fibrin glue shortens the surgical time and also provides decreased postoperative discomfort and complications.[8,9]

In this study, we evaluated and compared postoperative visual outcomes, complications and recurrence rates between patients with primary and recurrent pterygium, who had undergone pterygium operation with conjunctival autograft technique with fibrin glue.

MATERIAL AND METHODS

The study protocol was approved by the local ethics commitee. An informed consent was obtained from the patients for the surgery. The study was carried out according to the tenets of the Decleration of Helsinki.

Between March 2010 and May 2011, 72 eyes of 52 patients [24 males (46%), 28 females (54%)] who had undergone pterygium operation with conjunctival autograft technique with fibrin glue were included in this study. Their medical records were examined retrospectively. Their mean ages were 45.98±12.60 (SD) (21-69) years. Thirty two of them (61%) had unilateral and 20 of them (39%) had bilateral pterygium. Twenty seven (52%) patients had primary (group 1) and 25 (48%) patients (group 2) had recurrent pterygium. Complete ophthalmological examinations including refraction, uncorrected visual acuity (UCVA) and best corrected visval acuity BCVA, intraocular pressure (IOP) measurements, slit-lamp biomicroscopy and fundus examinations were made both preoperatively and postoperatively.

All the surgeries were performed by the same surgeon (SC). Under subconjunctival anesthesia, head of the pterygium was dissected from the cornea and excised by using Westcott scissor. Then, underlying Tenon capsule was excised and bleeding vessels were cauterized. The bare scleral defect was measured with calipers. A graft, 1 mm greater than the size measured, was obtained from the superior bulbar conjunctiva by separating the tenon tissue carefully. The autograft was placed by keeping stromal side up onto the cornea. Two components of fibrin glue (Tisseel, Baxter Healthcare Corp. CA, USA) were applied separately. Firstly, fibrinogen component was applied to the scleral bed and thrombin component was applied to the stromal surface of the autograft. Then, the autograft was placed on the scleral bed. Separate application of the fibrin glue components allowed us more time to place the autograft properly before fibrin clot formation. The eyes were patched after the operation. Patients were advised to use lomefloxacin and dexamethasone 0.1%, 4 times a day for 4 weeks postoperatively. All the patients were examined on 1st day, 3rd week, 3rd month, 6th month, 1st year and 2nd year after the operation.

STATISTICAL ANALYSIS

For statistical analysis, SPSS version 22 programme was used. Data were compared using Chi-Square

test and Mann-Whitney U test. $p<0.05$ was accepted as significant.

RESULTS

In group 1, out of 27 patients, 12 (45%) were males, 15 (55%) were females. Fifteen of them (55%) had unilateral, 12 (45%) of them had bilateral pterygium. In group 2, out of 25 patients, 12 (48%) were males, 13 (52%) were females, 17 of them (68%) had unilateral, 8 (32%) of them had bilateral pterygium. In terms of sex and laterality, there was no significant difference between the two groups (p=0.680, p=0.270). Mean age of the first group was 55.71±7.00 (SD) (37-69) years and that of the second group was 34.48±6.49 (SD) (21-48) years. Mean age was statistically lower in the second group (p=0.00). The mean operation duration was 10.84±1.84 (SD) (8-15) min in the first group and 11.69±1.42 (10-15) min in the second group. The mean operation duration was significantly longer in the second group (p=0.042). The mean preoperative BCVA was 0.91±0.10 (SD) (0.7-1.00) (Snellen, decimal) in the first group and 0.91±0.08 (SD) (0.8-1.00) in the second group and the mean postoperative BCVA was 0.97±0.05 (SD) (0.8-1.00) in the first group and 0.96±0.04 (SD) (0.9-1.00) in the second group. In terms of both preoperative and postoperative BCVA, there was no significant difference between two groups (p=0.573, p=0.110). Recurrence occured only in one eye (2%) in the first group in the 4th month and one eye (3%) in the second group in the 6th month. The difference between the two groups was not significant (p=0.905).

Postoperatively, at the end of 3rd week in the first group, in one patient, graft necrosis occured, may be due to excessive cauterization. Re-autografting was performed for this patient and there was no problem at her long-term follow-up examinations. In the first group again, two patients developed dellen. With intense lubrication and hard bandage and patching, the problem was solved. In the second group at the end of 1st month postoperatively, pyogenic granuloma developed in one patient; may be due to insufficient Tenon capsule excision. Simple excision was performed and he had no problem subsequently. Again, in the second group, subconjunctival hemorrhage was observed in one patient and graft edema was observed in two patients. With continuation of the standard therapy, these problems were solved. In terms of postoperative complications, there was no significant difference between two groups (p=0.530). Characteristics and results of surgeries of the patients were summarized (Table 1).

TABLE 1: Characteristics and results of surgeries of the patients.

		Group 1 (Primary Pterygium)	Group 2 (Recurrent Pterygium)	P value
Age (years)		55.71±7.00 (SD) (37-69)	34.48±6.49 (SD) (21-48)	0.00
Sex	Male	12 (45%)	12 (48%)	0.680
	Female	15 (55%)	13 (52%)	
Laterality	Unilateral	15 (55%)	17 (68%)	0.270
	Bilateral	12 (45%)	8 (32%)	
Mean operation duration (minutes)		10.84±1.84 (SD) (8-15)	11.69±1.42 (10-15)	0.042
Mean preoperative BCVA		0.91±0.10 (SD) (0.7-1.00)	0.97±0.05 (SD) (0.8-1.00)	0.573
Mean postoperative BCVA (Snellen, Decimal)		0.96±0.04 (SD) (0.9-1.00)	0.91±0.08 (SD) (0.8-1.00)	0.110
Recurrence (number of patients)		1 (2%)	1 (3%)	0.905
Complications (number of patients)				
Graft edema		None	2 (6%)	
Subconjuntival hemorrhage		None	1 (3%)	
Dellen		2 (5%)	None	0.530
Pyogenic granuloma		None	1 (3%)	
Graft necrosis		1 (2%)	None	

BCVA: Best corrected visual acuity; SD: Standard deviation.

DISCUSSION

Conjunctival autograft transplantation technique was first described by Kenyon et al. in 1985.[10] Since then, this technique has developed. The usage of fibrin glue, a tissue adhesive, was first described by Koranyi et al. in 2004.[11] The use of fibrin glue, instead of suture, significantly reduces the surgery time and increases the patient's comfort postoperatively and prevents suture-related complications.[12-18] Both these two techniques also reduce recurrence rate, but it is controversial that fibrin glue usage technique decreases the recurrence rate more than the suturing technique. Some authors report that it is more effective in decreasing the recurrence rate. However, others say that there is no significant difference between these two techniques in decreasing the recurrence rates.[19-21] In this study, we also got low recurrence rates both in primary and recurrent pterygium groups (2%, 3%) and there was no significant difference between these two groups in terms of recurrence.

Sandra et al. reported that the use of fibrin glue was a safe, easy and effective technique for attaching the conjunctival autograft in pterygium surgery and the morphology of pterygium influenced recurrence rates, without significant intraoperative and postoperative complications.[22] Shehadeh-Mashor et al. reported that pterygium excision and conjunctival autograft using fibrin glue to secure the graft combined with intraoperative mitomycin C seems to be a safe and effective surgical option for treating recurrent pterygium.[23]

When the two components of the fibrin glue are applied simultaneously, a fibrin clot forms within approximately 30 seconds.[11] Therefore, there is limited time for positioning of the graft. However, if two components are used separately, there is more time to position the graft properly. Therefore, we used the two components separately.

Fibrin glue is also used in other branches of medicine. In ophthalmology, beside pterygium, it is used in cataract, oculoplastic, orbita and glaucoma surgeries, too.[8] Fibrin glue is derived from plasma. For this reason, it may cause some viral infection transmissions and allergic reactions.[24] However, we did not encounter such a case in this study.

Younger age is an important factor for the recurrence of pterygium.[20] In our study, the mean age of recurrent pterygium group was significantly lower than that of primary pterygium group; and the operation duration was significantly longer in this group. However, by using conjunctival autograft technique with fibrin glue, there was no significant difference between these two groups with respect to complication and recurrence.

CONCLUSION

In conclusion, the use of fibrin glue for attachment of conjunctival autograft is a safe technique and has low complication and recurrence rates. In recurrent pterygium group, the mean age was significantly lower and the mean operation duration was significantly longer. Complication and recurrence rates were low in both primary and recurrent pterygium groups and there was no significant difference between two groups.

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