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Professional paper

Retrospective Clinical Analysis of Free Conjunctival Autograft in Treatment of Pterygia

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A B S T R A C T

The paper is a clinical retrospective analysis of free conjunctival autograft in treatment of pterygia. In period from 1998 until 2006, 47 patients with pterygia were operated using free conjunctival autograft. There were 19 female and 38 male, average age 61 years. In the majority of patients (39/47) it was a primary pterygia. Eight patients were on topical antiglaucoma therapy. Free autograft was taken from superotemporal conjunctiva. Introduction of a single nylon suture to mark the epithelial side of the graft as well as the use of running 10–0 nylon suture for the graft that stays in up to two months, were our modifications of the standard technique. The mean follow-up was 18.7±9.8 months. Free conjunctival autograft was successfully taken in all patients. Four of them experienced transient graft edema. In glaucoma patients, delayed healing of the cornea, conjunctival harvest area and the graft was noted. The best corrected visual acuity was improved in all patients, from 1–3 Snellen lines. Recurrence of the pterygium was noted in three patients, two of them already with recurrent pterygium. Free conjunctival graft is a safe and effective method of pterygium surgery that produces only few complications and has low recurrence rate. We found useful switch from topical to systemic antiglaucoma therapy as well as adjunctive use of autologous serum drops in promoting and accelerating healing in glaucoma patients.

***Key words**: pterygium, autologous, graft, free conjunctival autograft, conjunctiva*

Introduction

Pterygia are triangular fleshy fibrovascular overgrowths of the conjunctiva onto the cornea[1] (Figure 1). Etiology most likely lies in the influence of ultraviolet radiation, dust, heat, wind and dry atmosphere[2]. Limbal basal epithelium was found to be the origin of advancing cells at the head of pterygium[3]. True mechanism of its growth onto the cornea is unknown[4]. Pterygia should be removed only if there is recent progression threatening vision. Avulsion[1], simple excision[1], bare-sclera technique[5], rotation and sliding conjunctival flap[6], limbal and free conjunctival autograft[7], autologous cultivated conjunctival transplantation[8], amniotic membrane transplantation[9] and lamellar corneal grafts[1] have all been used. Adjunctive therapy consists of antimetabolites such as triethylene thiophosphoramide (thiotepa)[4], mitomycine C[10] and daunorubicin[11], beta-irradiation[12], laser and thermal cautery[13]. However, the recurrence rate was up to 40% in various studies[7–13,14,15], nearly all seen by one year of surgery[16].

The aim of this paper was retrospective analysis of free conjunctival autograft (not involving limbal area) in treatment of primary and recurrent pterygia.

Materials and Methods

In period from December 1998 until January 2006, 47 patients with pterygia were operated by the same author (BKE) using free conjunctival autograft. There were 19 female and 38 male, average age 62±13.8 years, median 63 years (38–83 years). There were 39 primary and eight recurrent pterygia. Primary surgery was done elsewhere using sliding conjunctival flap involving approximation of superior and inferior edges of conjunctiva with sutures, without passing the sclera. No motility disturbances were present on neither of patients. Eight patients were on topical antiglaucoma therapy, three as monotherapy, two on dual and the rest on triple therapy.

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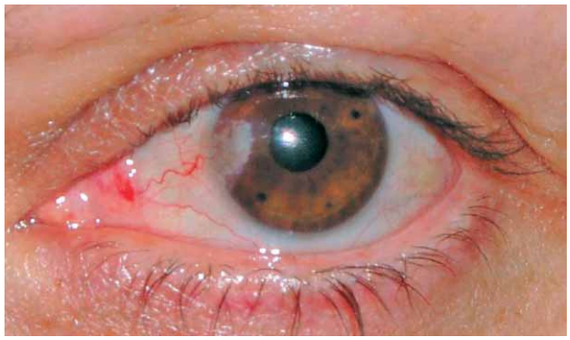

Fig. 1. Pterygium – a fleshy fibrovascular overgrowth of the conjunctiva on the cornea

The duration of the therapy was from 5–14 years. Five of these patients were on therapy for 10–14 years (one patient on monotherapy, one on dual and three patients on triple therapy).

Excision of pterygia was performed in local anesthesia (2% lidocaine with epinephrine (Xylocaine) 1.5 mL parabulbar and 0.5 mL subconjunctival under the body of pterygium). Ophthalmic surgeon sat at 12 o'clock position. Two horizontal and one vertical incision were made to dissect the body of pterygium from the sclera. It was then reflected centrally. Residual epibulbar scar tissue was removed, light cautery applied to the sclera and attachments of the pterygium to the limbus severed. The body of pterygium was grasped to avulse the head of pterygium from the cornea. If it was not possible, lamellar keratectomy was performed. The depth of the cut in the cornea was usually beneath Bowman's layer.

Patient was then asked to look down and nasally to expose the superotemporal bulbar conjunctiva. Xylocaine (0.5 mL) was injected subconjunctivally very close to the surface to lift the epithelium. Paper template was used to record the size and the shape of the graft. Conjunctiva was accordingly outlined with the cautery. No limbal area was involved. One 10–0 nylon suture was placed in the middle of the graft-to-be to mark the epithelial surface of the conjunctiva (Figure 2). The knot was tide 2 mm in front of the conjunctival surface. The bulbar conjunctiva was dissected with blunt-tipped Westcott scissors. In 10 patients radiofrequency (Ellman) unit was used for conjunctiva harvest because it was briefly available to us.

The graft was transported onto the bare sclera holding it by the preplaced knot in a form of a closed umbrella. In the first 11 patients 9–0 polyglactin suture (Vicryl) was used to secure the graft to the edges of conjunctiva and episclera. In five of them these were interrupted sutures and in the rest a running suture. After that we started using running 10–0 nylon suture as a routine.

Topical 1% tropicamide (Mydryacil) and tobramycine (Tobrex) drops were applied and the eye patched. The same cycloplegic agent was instilled twice a day until the inflammation subsided. Corticosteroid drops were introduced usually 3–6 days after the surgery when the harvesting area and the corneal surface were healed.

Topical antiglaucoma medication was stopped for the duration of healing. Acetazolamide (Diamox) tbl a 250 mg and potassium chloride tablets (KCl) were given to control the intraocular pressure. Since 2003, in all patients with topical antiglaucoma medication and those with recurrent pterygia, autologous serum drops were applied 10 times a day until the healing was complete, the graft was taken and the suture removed. The mean follow-up was 18.7±9.8 months, median 18 months (range 6–36 months).

Results

Free conjunctival autograft was successfully taken in all patients. Four of them experienced transient graft edema that occurred 3–7 days postoperatively and lasted from 10–14 days. It was treated early with pressure patching and, after conjunctiva and cornea healed, with topical corticosteroid drops. In one patient with severe graft edema, small dellen developed at the limbal area adjacent to the graft. Topical corticosteroid therapy was stopped, autologous serum introduced and the eye patched. It resolved in 10 days.

In five out of 11 patients with polyglactin 9–0 suture (two with interrupted and three with running suture) granuloma was noted at the conjunctival edge 11–18 days after the surgery. Suture was taken out. In one patient the graft came partially off after the suture removal due to granuloma formation. The suture was taken out 13 days postoperatively and the patient came back two days later with the complaint of epiphora and foreign body sensation after rubbing the eye. Two-thirds of the graft came off the host bed and the 10–0 nylon suture had to be placed. The graft healed well.

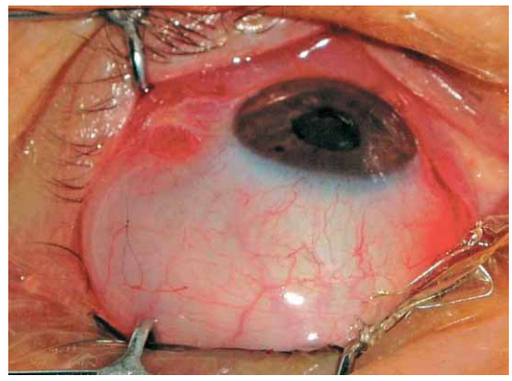

Fig. 2. One 10–0 nylon suture placed in the middle of the graft-to-be to mark the epithelial surface

Cornea healed in all but eight glaucoma patients in 48 to 72 hours. In these eight patients delayed healing of the cornea, conjunctival harvest area and the graft was noted. Topical therapy was removed and the patients were

kept on oral acetazolamide tablets until the healing was completed. In two patients on single topical agents it took 4–6 days for harvesting area and cornea to heal. However, in one patient who was on monotherapy for longer than 10 years as well as in all patients on dual and triple therapy, it took 7–10 days for the healing to occur.

The best corrected visual acuity was improved in all patients, from 1–3 Snellen lines.

Recurrence of the pterygium was noted in three patients, two of them already with recurrent pterygia. In two patients, it was noticed 2 months postoperatively and in one patient 3 months postoperatively. In patient with recurrence after 3 months, pterygium was operated using conjunctival autograft not involving limbal area, combined with intraoperative use of mitomycine C. However, it recurred again, but this time it stopped at 1.5 mm from limbus on cornea. No further attempts were made to operate it. It stayed the same for 3 years. In the remaining two patients with recurrence at two months after surgery, pterygium was reoperated using free conjunctival autograft. The follow-up is five and three months respectively, without recurrence.

Discussion

Surgery is the treatment of choice for pterygium. There is no ideal procedure that would guarantee no recurrence. Free conjunctival autograft has been reported as an effective method with low recurrence rate[17,18]. According to available literature, the recurrence rate for limbal versus free conjunctival autograft does not differ significantly[7]. We started using free conjunctival autograft in 1998. Since few complications were experienced and recurrence rate was low, we have stuck to this technique until today. Only superotemporal bulbar conjunctiva was used. We found lidocaine 2% with epinephrine given in dosage of 0.5 mL subconjunctival under the harvesting area useful in terms of additional anesthesia, hemostasis and elevation of conjunctiva from Tenon's capsule. Subsequently, we've got thin graft and smooth harvest area that heal fast and provide satisfactory functional and cosmetic result at the harvest and host bed (Figure 3).

There are different ways to mark the epithelial surface of the conjunctival autograft[1]. In the first 5 patients the surgeon found it very complicated to make sure that the epithelial side was not apposed to the sclera. Gentian violet was not available, so fluorescein was used as well as cautery marks. Then the surgeon started using the 10–0 single suture at the centre of the graft-to-be to mark the epithelial surface. The knot was tied two millimeters above the surface to allow elevation and transportation of the graft in a way of a closed umbrella. To the best of our knowledge and the search of the available literature this is the first time that this technique of marking the graft is reported.

Radiofrequency unit (Ellman) has been available to us only briefly. We found it to be easy and safe method for conjunctival autograft harvesting as reported in literature[19].

Fig. 3. Postoperative finding seven months after the procedure in 79-year-old male patient

Polyglactin 9–0 suture was rather difficult to put on thin graft and host conjunctiva edge, interrupted or running. First, we have used interrupted sutures. Every time the needle was introduced to the graft edge and tried to pass it through, the edge rolled in. Patients complained of foreign body sensation, probably due to the knot irritation. Therefore, we have tried with running 9–0 polyglactin suture. It did not make life any easier to the surgeon, but patients were complaining less. However, granuloma was noted at the conjunctival edges in five patients. Although reperfusion of conjunctival autograft occurs as early as one week postoperatively[20], in one patient the graft came partially off after the suture removal due to granuloma formation 13 days postoperatively. For all these reasons, 10–0 nylon running suture was introduced. It made the surgeon very happy to start with, patients complained less of foreign body sensation and it could be left in for 1.5–2 months to make sure that edges of the host area and the graft healed together. Although there were complication reported with the use of nylon in suturing the graft such as superficial corneal vessels development[21] we had none.

Topical antiglaucoma therapy, especially dual and triple therapy was found to postpone the healing of the harvest area and the graft in the analyzed group of patients. Reviewing the literature, we found no reports of such complication. We also noted that healing was slower in patients who were under the glaucoma therapy for more than 10 years. Therefore, in our patients following pterygium surgery, all topical agents were routinely removed and replaced with oral acetazolamide tablets, until healing took place. Additionally, since 2003, autologous serum has been introduced as an adjunctive postoperative therapy. In our experience it has shown great potential in improving the healing of complicated cases.

Some degree of corneal scarring was inevitable in our patients because diamond burr was not available and the tags were scraped with the crescent blade. However, satisfactory improvement of the best corrected visual acuity and cosmesis was noted in all our patients.

Conclusion

Free conjunctival graft is a safe and effective method of pterygium surgery that produces only few complications and has low recurrence rate. Introduction of single nylon suture to mark the epithelial side of the graft that also helps its transport to the host area in a way of a closed umbrella, as well as the use of running 10–0 nylon suture for the graft, that stays in up to two months, are our modifications of the standard technique. Also, we found that the replacement of the topical with oral antiglaucoma medication for the time of healing as well as adjunctive use of autologous serum drops, promote and accelerate epithelization in glaucoma patients.

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RETROSPEKTIVNA KLINIČKA STUDIJA SLOBODNOG SPOJNIČNOG PRESATKA U LIJEČENJU PTERIGIJA

SAŽETAK

Prikazani su rezultati retrospektivne kliničke studije slobodnog spojničnog presatka u liječenju pterigija. U periodu od 1998. do 2006. godine, 47 pacijenata s pterigijem je operirano uporabom slobodnog spojničnog presatka. Bilo je 19 žena i 38 muškaraca, prosječne dobi od 61 godinu. Osmero ih je bilo na topikalnoj antiglaukomskoj terapiji. Slobodni spojnični presadak je uzet sa superotemporalnog dijela spojnice bulbusa. Naša modifikacija standardne tehnike se sastojala u uporabi pojedinačnog najlonskog šava za označavanje epitelne strane presatka te 10–0 najlonski produžni šav za presadak koji ostaje do dva mjeseca. Prosječno vrijeme praćenja je bilo 18,7±9,8 mjeseci. Slobodni spojnični presadak se uredno primio u svih pacijenata. Četvero pacijenata je imalo prolazni edem presatka. U glaukomskih pacijenata je bilo produljeno vrijeme cijeljenja rožnice i spojnice. Svi pacijenti su imali poboljšanje vidne oštrine postoperativno za 1–3 reda na Snellenovim optotipima. Ponovna pojava pterigija je zabilježena u troje pacijenta s već rekurentnim pterigijem. Slobodni spojnični presadak je sigurna i uspješna metoda u liječenju pterigija koja je u našoj populaciji bila praćena s vrlo malo komplikacija i malim postotkom ponovnih pterigija. Kod glaukomskih pacijenta su prelazak s topikalne na sistemnu antiglaukomsku terapiju i uporaba autolognog seruma postoperativno pridonijeli cijeljenju spojnice.