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Original Article

Comparison between sutureless and glue free versus sutured limbal conjunctival autograft in primary pterygium surgery

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Abstract

Purpose: To compare and evaluate the safety and efficacy of two surgical techniques for the management of primary pterygium.
Design: Prospective randomized clinical trial using the CONSORT 2010 Statement (Consolidated Standards of Reporting Trials) for parallel group randomized trials.
Setting: Department of Ophthalmology, Al-Minya University, Faculty of Medicine, Egypt.
Methods: The study included 150 eyes of 150 patients with primary pterygium. The mean age was 49 ± 12 years (range 24–74 years). Simple excision under local anesthesia was performed followed by closure of the bare sclera by suture less and glue free conjunctival autograft in 50 eyes of 50 patients (group 1), versus the conventional method of a sutured conjunctival autograft in 100 eyes of 100 patients (group 2).
Results: The pterygium recurrence rate was 6% for group 1, 8% for group 2.
Graft dehiscence occurred in 4 eyes out of 50 (8%) in group 1. Graft retraction occurred in 6 (12%) out of 50 eyes for group 1 versus 6 eyes (6%) in group 2. Pyogenic granuloma occurred in 3 (3%) eyes out of 100 in group 2. No other serious complications were noted. At the 3 week visit the overall patient satisfaction score was statistically significantly higher for group 1 ($P < 0.002$) compared to group 2. At 3 months postoperatively, the gain in uncorrected visual acuity (UCVA) ranged from 0.2 to 0.5 Log MAR in 10 eyes.
Conclusion: Sutureless and glue free conjunctival autograft technique is easy, safe, effective, prevents potential adverse reactions encountered with the use of foreign materials. This technique has an acceptable pterygium recurrence rate that is comparable to conventional sutured conjunctival autograft for primary pterygium.

Keywords: Pterygium surgery, Sutureless glue free conjunctival autograft, Conjunctival autograft, Amniotic membrane graft

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Introduction

Pterygium (derived from *pterygion*, ancient Greek for wing) is a common ocular disease seen mostly in tropical and subtropical areas between the latitudes 30 north and south of the equator.[1,2] Pterygium is an abnormal overgrowth of fibrovascular tissue arising from the subconjunctiva toward the cornea, almost always in the palpebral fissure and thought to be caused by increased light exposure, dust, dryness, heat and wind. Although it can be easily excised, it has a high rate of recurrence ranging from 24% to 89%.[3] Recently, with the popularity of conjunctival autograft and use of antimetabolites such as mitomycin C and 5-Fluorouracil the incidence of recurrence has been greatly reduced up to 12%.[4–6] The role of carbon dioxide and eximer lasers in pterygium surgery remains uncertain. Additionally, the relative benefits and risks are debatable of physiochemical methods to prevent recurrence. For example possible

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complications of mitomycin C and beta-irradiation include aseptic necrosis of the sclera and cornea, cataract, persistent epithelial defects and visual loss.[7]

Therefore, a simple surgical procedure that can reduce the recurrence rate to an acceptable level with minimal complications and without the use of potentially toxic drugs or radiotherapy would be ideal for the management of pterygium. Recent reports favor the use of fibrin glue above sutures. The use of fibrin glue has been reported to improve comfort, decrease surgical time, reduce complications and recurrence rates.[8–11] Suture-related complications include infection, prolonged operating time, postoperative discomfort, suture abscesses, buttonholes, and pyogenic granuloma which usually require a second surgery for removal and chronic inflammation,[12,13] Plasma-derived fibrin glue has the potential risk of prion disease transmission and anaphylaxis in susceptible individuals.

Sutureless grafting has been used successfully in gingival grafts,[14] and represents a similar mucosal membrane tissue environment to the conjunctiva of the eye. In this study, we compare and evaluate the safety and efficacy of sutureless glue free limbal conjunctival autograft and conventional sutured autograft for the management of primary pterygium.

Material and methods

The study sample was comprised of 150 eyes of 150 patients with primary pterygium. The patients complained of conjunctival injection, tearing, rapid growth with cosmetic concerns, and encroachment of the pupillary area threatening the visual axis or blurred vision from induced astigmatism (Fig. 1). Exclusion criteria were inability to complete the two year follow up period, atrophic pterygium, pseudopterygium, ocular surface pathology, infection, previous limbal surgery or double head pterygium. The study adhered to the tenets of the Declaration of Helsinki for research in humans and informed written consent was obtained from all patients.

All patients underwent a comprehensive ophthalmologic examination including visual acuity, refraction, slit lamp biomicroscopy, measurement of intraocular pressure, extraocular muscle movements and dilated funduscopy. Anterior segment photography was performed for documentation of pterygium size and morphology.

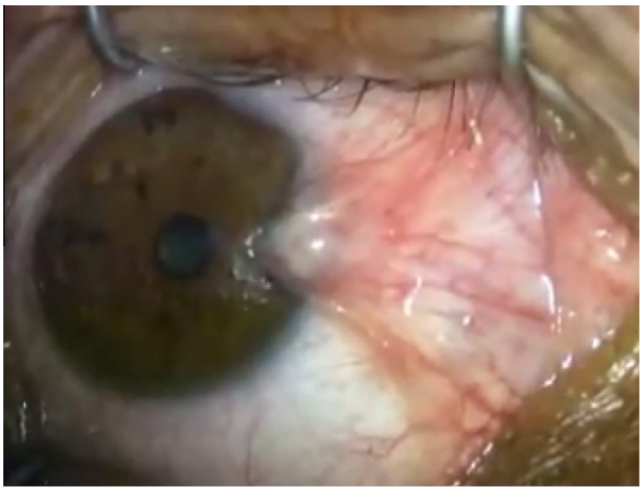

Figure 1. A case of pre-operative primary right nasal pterygium.

The patients were randomly assigned into one of two groups: group 1 underwent sutureless and glue free limbal conjunctival autograft ($n = 50$ eyes) and group 2 underwent free limbal conjunctival autograft with suturing, ($n = 100$ eyes). The technique used in our study is simple randomization technique.[15] This technique maintains complete randomization of patient assignment to a particular group. The most common and basic method of simple randomization is a coin toss. For example, with the two treatment groups (group 1 versus group 2), each side of the coin determines the assignment of each patient to a group. The goals of pterygium surgery were to remove the pterygium, restore the conjunctival anatomy, leave the cornea as smooth and clear as possible, and prevent recurrence. Simple pterygium excision was performed under peribulbar anesthesia (Xylocaine 2%). After an eyelid speculum was inserted, a traction suture (6–0 Vicryl on a spatulated needle) was placed proximal to the limbus at the ''6-o'clock position''. Hand held cautery was used to outline the edge of the pterygium to be excised usually 4 mm from the limbus. Local anesthesia was used to balloon the pterygium separating it from the sclera. Excision consisted of detachment of the pterygium head using a crescent knife and dissection of the body from the overlying conjunctiva in a smooth clear plane as possible using blunt and sharp dissection. Subsequently, the subconjuctival pterygium tissue and the thickened segment of conjunctiva and adjacent Tenońs capsule were excised leaving bare sclera. Then the size of bare scleral was measured with calipers and the area documented in mm^2.

For harvesting the conjunctival autograft, the globe is rotated upward with a limbal traction suture. The inferior temporal quadrant of bulbar conjunctiva was injected with 1 cc of local anesthesia (Xylocaine 2%) to facilitate separation of the conjunctiva from Tenon's capsule then, a marker was used to mark the four corners of the conjunctival limbal graft to be created 2 mm larger in width and length than the recipient bed. A small opening was created and careful blunt dissection with Wescott scissors was performed until the entire graft was free from Tenons reaching the limbus to include limbal stem cells that act as a barrier to the conjunctival cells migrating onto the corneal surface. Subsequently, the edges of the graft were cut by Vannas scissors. Forceps is used to gently slide the graft to the recipient bed with the epithelial side up and keeping the limbal edge toward the limbus.

In group 1, hemostasis was allowed to occur spontaneously without use of cautery to provide autologous fibrin to glue the conjunctival autograft naturally in position without tension and the scleral bed was viewed through the transparent conjunctiva to ensure that residual bleeding did not lift the graft. Small central hemorrhages were tamponed with direct compression. The graft was held in position for 10 min by application of gentle pressure over the graft with fine non-toothed forceps. The stabilization of the graft was tested with a Merocel spear centrally and on each free edge to ensure firm adherence to the sclera. The eye was bandaged for 48 h.

In group 2, the graft was sutured in position with 10/0 nylon. First the two limbal corners were sutured into the episclera and then into the conjunctiva keeping the limbal edge of the graft on gentle stretch then the posterior corners of the graft were sutured to the bulbar conjunctiva and additional sutures were placed to close the wound edges. Both