

Case Report

Management of pterygium in a case of post radial keratotomy

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ABSTRACT

This study is a case of post radial keratotomy who underwent pterygium excision and its management. A 44 old high myope who underwent radial keratotomy more than a decade earlier underwent pterygium excision and conjunctival autograft. 6 months follow-up showed no recurrence of pterygium and improvement in corneal irregularity. Careful and meticulous dissection of pterygium over keratotomy wounds helps in prevention serous complications during surgery.

Keywords: Pterygium, Radial keratotomy, Fibrin glue, Astigmatism

INTRODUCTION

Radial keratotomy (RK) was the primary form of refractive surgical correction from the late 1970s to the early 1990s.¹ Approximately 250 000 of these procedures were performed annually in the early 1990s.² While several techniques exist, each involves making incisions into the cornea with the goal of flattening the cornea and reducing the amount of refractive error. It has been documented that these patients experienced complications such as prolonged healing times and incisions that did not heal well.³

A pterygium is a wing-shaped growth of fibrovascular conjunctiva onto the cornea. Its incidence varies across geographical locations. Several hypotheses have been attributed to its aetiology.⁴ Currently, it is believed that the pterygium is a growth disorder characterised by conjunctivalisation of the cornea due to localised ultraviolet induced damage to the limbal stem cells.⁵ The trauma caused by refractive surgery releases growth factors that can encourage the emergence of pterygium.⁶

The indications for surgery include reduced vision due to encroachment of the visual axis and irregular

astigmatism, chronic irritation and recurrent inflammation, restriction of ocular motility, and cosmesis.

There are several potential problems in patients with radial keratotomy (RK) who subsequently have ocular surgery due to decreased corneal integrity. Since the cornea is structurally weakened by RK incisions, ocular trauma or procedures may result in partial or complete wound dehiscence. There are case reports on various ocular surgeries after RK scattered in literature but to the best of our knowledge no published report on pterygium excision after RK surgery.^{3,7-9} We hereby report a case of pterygium excision in a patient with post RK surgery.

CASE REPORT

A 44-year old male, high myope, presented with recurrent irritation in his right eye since 5 months. On examination his best corrected distance visual acuity was 6/12 on Snellen's acuity chart. Slit lamp examination revealed nasal pterygium, vascular, grade 2 encroaching the visual axis along with underlying 18 degree radial keratotomy (RK) incision sparing central corneal in right eye (Figure 1). He also had a posterior chamber IOL in the bag.

Posterior segment showed a myopic fundus with attached retina. Left eye also had RK incisions with a clear lens and stable retina. Radial keratotomy was done in both eyes 15 years ago. Corneal topography in right eye showed central irregularity and flattening of the horizontal meridian (Figure 2). As he was cosmetically concerned and had persistent ocular irritation in his right eye, pterygium excision with conjunctival autograft was planned under local anaesthesia.

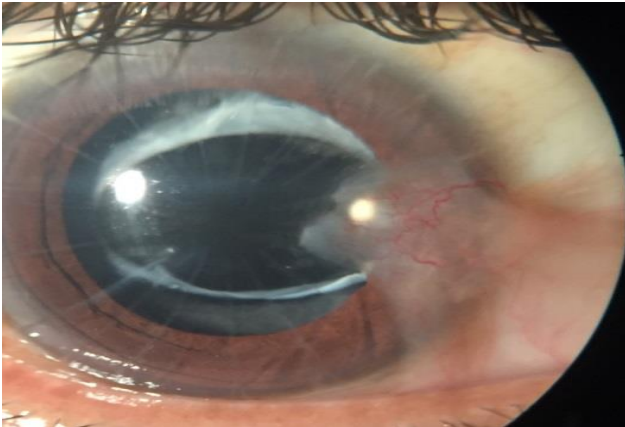


Figure 1: Slit-lamp image of the right eye showing nasal pterygium with underlying radial keratotomy incisions and a PCIOL.

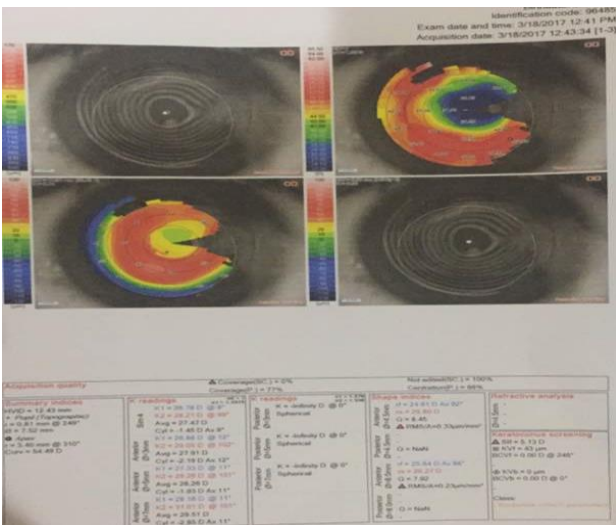


Figure 2: Corneal topography of right eye showing flattening of horizontal meridian.

The head of pterygium was grasped with a forceps and gently peeled from underlying cornea. The remaining subconjunctival degenerative part of pterygium was excised with conjunctival scissor. The corneal and limbal surfaces were smoothed by scraping with a Bard-Parker blade. The entire surgical tissue handling was done gently taking care not to open up the keratotomy incisions. For harvesting conjunctival autograft, the eyeball was rotated down and in. An area measuring 1 mm greater than the bare sclera was demarcated. In supero-temporal bulbar

conjunctiva 1cc of the balanced salt solution was injected to facilitate separation of conjunctiva from Tenon's capsule. Blunt dissection of the conjunctiva was carried out using conjunctival scissor. The autograft was cut and gently slid into place over the bare sclera in its correct anatomical orientation and attached with fibrin glue. At the end of the surgery wound leak from the keratotomy incisions was checked thoroughly.

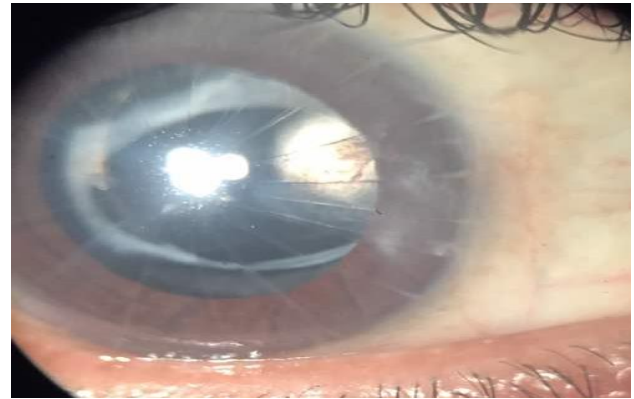


Figure 3: Slit lap image showing conjunctival autograft in place with intact radial keratotomy incisions 6 month postoperatively.

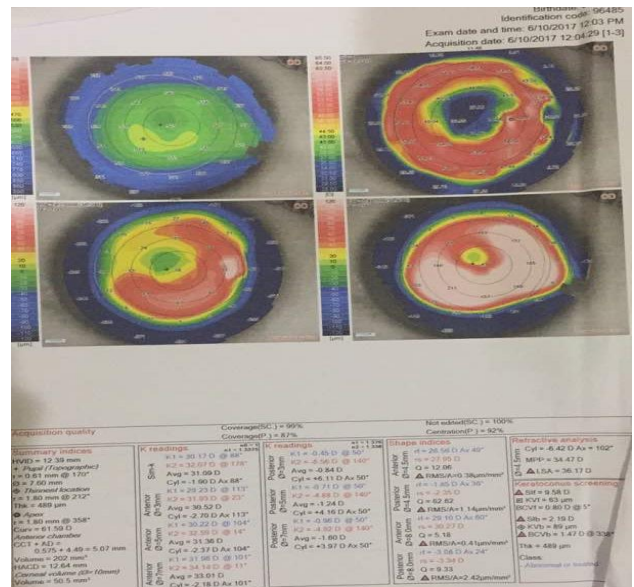


Figure 4: Corneal topography of right eye showing steepening of horizontal meridian and central corneal curvature 6 month postoperatively.

Post operatively he was put on topical moxifloxacin 0.5% and dexamethasone 1%, 4th hourly and followed for 1 day, 1 week and 1 month with tapering of medication. 6 month follow up showed conjunctival autograft in place with no recurrence (Figure 3).

Corneal topography was repeated at 6 months (Figure 4) showed steepening in the horizontal meridian and also improvement in central corneal curvature.

DISCUSSION

Linear RK incisions were typically made in a spoke-like pattern extending from a 3-4 mm central optical zone peripherally to ideally within 1-2 mm of the limbus. The incisions were made to 90-95% corneal stromal depth and numbered from 2 up to 32 or higher in some extreme cases. Most spherical myopic RK treatments involved 4-16 radial incisions arranged in a symmetric wagon wheel spoke pattern over the cornea.

Pterygium is classically defined as a degenerative disease of the ocular surface with fibrovascular tissue formation of triangular shape, which grows from the conjunctiva onto the cornea. Although its pathogenesis has not been completely clarified, it is very likely that pterygium represents a degenerative response of fibrous connective tissue to different stimuli. Among the risk factors, the exposure to ultraviolet radiation seems to play an important role for inducing damage to the limbic germ cells. As consequences, there are conjunctival migration towards the cornea, chronic inflammation, and formation of fibrovascular tissue. Other risk factors described related to the development of pterygium are the micro injuries in the limbus, trauma caused by refractive surgery releasing growth factors and hereditary factors.⁶⁻¹⁰

Frequently, pterygium originates chronic irritative symptoms as foreign body sensation, burning, ocular hyperemia or photophobia. With the progression, it can extend over the cornea, decreasing the visual acuity by astigmatism induced due to changes in the refractive surface determined by changes in the tear film. A tear meniscus develops between the corneal apex and the elevated pterygium, causing an apparent flattening of the horizontal meridian of cornea.¹¹

In our case pterygium excision was planned in view of corneal refractive changes and cosmetic disfigurement anticipating potential complications like rupture of the RK incisions. Conjunctival autograft was preferred because of low recurrence rates when compared to amniotic membrane.¹² The use of fibrin glue to attach the free conjunctival autograft in pterygium surgery produces shorter operating time, less postoperative discomfort, and lower recurrence rates.^{13,14} Shorter surgery time logically translates into lower infection risk and saves valuable operating theater time. The patient stands to benefit on account of an earlier return to normal life due to greater postoperative comfort.

There have been various case reports of rupture of an RK incision during ocular surgeries.¹⁵⁻¹⁷ Luttrull and coauthors observed that the cornea ruptured at the keratotomy incisions when cuts were 95% or thicker and concluded that when the thickness of the intact cornea is less than that of the thinnest part of sclera, the cornea is more vulnerable to rupture.¹⁸

Wound healing after RK has been reported to take up to 47 months.¹⁹ Remodelling may take as long as 4 to 5 years.²⁰ The wound is unstable with weakened corneal integrity with low tensile strength of the cornea. Bryant and co-authors examined the tensile strength of fully healed RK incisions after 8 years in human donor corneas and found it no different from normal strength but McDonne stated that there are no available data to establish the postoperative interval required for the cornea to return to its native strength.^{21,22}

In our case even though the incisions were 15 years old it did not completely eliminate the risk of spontaneous rupture during surgery. Due to gentle manipulations and by following a technique of dissection which involved minimum handling of corneal tissue, there were no intra operative complications hence a good final visual and cosmetic outcome was achieved.

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Ethical approval: Not required

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