

Epithelial Ingrowth after Penetrating Trauma

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ABSTRACT

This is a case report about the anterior segment findings of epithelial ingrowth in a young female patient after penetrating trauma. The patient underwent multiple surgeries after penetrating trauma and epithelial ingrowth was noted on regular follow-up. Epithelial ingrowth was noted along the inner surface of corneal endothelium along with the presence of cysts. These findings suggest that epithelium penetrated through the site of perforation and grew along endothelium. Although epithelial ingrowth is a commonly reported complication of photorefractive surgery, it is rarely reported after trauma to eye. To authors' knowledge, this is the first reported case of epithelial ingrowth in Pakistan.

Key Words: Penetrating trauma. Anterior segment. Epithelial ingrowth. Pain. Photophobia.

INTRODUCTION

In the past, epithelial ingrowth was a common complication after ocular surgery. The advent of new instruments and techniques for ocular surgery has resulted in decrease in the incidence of epithelial ingrowth after ocular surgery.

Previous studies reported an incidence of epithelial ingrowth in 0.09 - 0.12 percent of patients after ocular surgery.^{1,2} The mechanism of epithelial ingrowth is almost same after penetrating trauma and ocular surgery. This report describes the condition in a young girl.

CASE REPORT

A 22-year girl presented to the outpatient department with the complaints of decreased vision, pain and photophobia in the right eye over a duration of 18 years. She had a history of trauma to the right eye followed by corneal tear repair in childhood. Other surgical history included cataract extraction and intraocular lens implantation six years ago, after which she underwent intraocular lens redialing with surgical membranectomy one year ago and anterior chamber paracentesis six months ago. The complaint of pain and photophobia in right eye started after cataract extraction and intraocular lens implantation. Iris prolapsed through the limbal wound some days after cataract surgery. Iris reposition and wound restitching was subsequently done. Ophthalmic history was unremarkable for any photorefractive procedure, glasses use or any use of ocular medication. Birth and family history were unremarkable as well.

On ocular examination, her visual acuity was light perception in the right eye and 20/20 in the left eye. Visual fields were restricted on confrontation test in the right eye and were comparative to examiner in the left eye. Pupil was mid-dilated and non-reactive to light in the right eye and round, regular reactive in the left eye. Intraocular pressure was 29 mm Hg in the right eye and 18 mm Hg in the left eye. On Slit Lamp Bimicroscopy ocular adnexa were normal bilaterally. Right eye revealed limbal stitches at 9 O'clock. A fibrosed and opaque line of healed corneal laceration was present extending from 1 to 7 O'clock. Descemet folds were present in the same area. A grey white sheet was noted extending into the anterior chamber from the limbal stitches towards the healed laceration covering almost all the endothelium in between and not extending on the iris. The intraocular lens was tilted and slightly decentered with papillary capture. On gonioscopy the angles were wide open bilaterally. The view of the posterior segment of right eye was not possible (Figure 1). Slit lamp examination was unremarkable in the left eye.

On the basis of the examination, a provisional diagnosis of epithelial ingrowth was made. Anterior segment

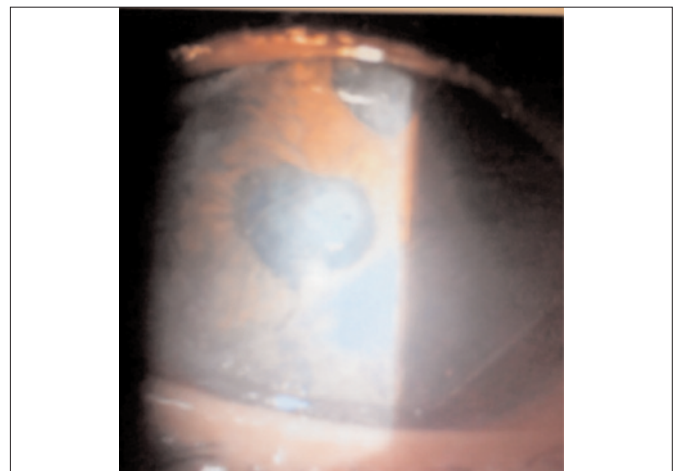


Figure 1: Slit lamp photograph of right eye of the patient showing diffuse corneal haze and opacification with a peripheral iridotomy.

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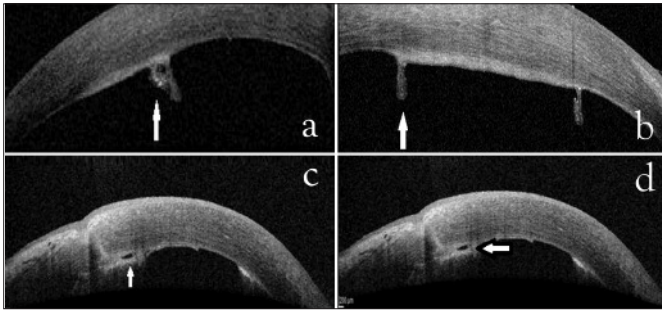


Figure 2: Anterior segment OCT (a) showing a membrane covering the endothelium (denoted by arrow) (b) showing epithelial ingrowth (denoted by arrow) (c) showing epithelial cyst (denoted by arrow) (d) epithelial cyst on the undersurface of the cornea (denoted by arrow).

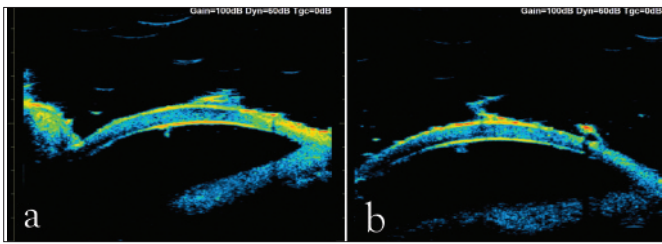


Figure 3: Ultrasound bimicroscopy showed growth of epithelium on the inner side of endothelium

optical coherence tomograph was ordered, which revealed a membrane extending from the limbus towards the site of corneal laceration and covering the endothelium. The endothelium beneath the membrane was intact and no discontinuity in the Descemet's membrane was noted, suggesting the membrane to be epithelial ingrowth (Figure 2). Ultrasound Bimicroscopy showed growth of epithelium on the inner side of endothelium; however, the ingrowth did not extend on to the iris ciliary body and anterior chamber angle (Figure 3).

The epithelial ingrowth was removed with the application of Nd: YAG laser to the corneal endothelium.

DISCUSSION

To the authors' knowledge, this is the first reported case of post-traumatic epithelial ingrowth post-trauma in Pakistan. Epithelial ingrowth has been commonly reported after photorefractive procedures but rarely after ocular trauma.¹ Epithelial ingrowth is a potentially sight-threatening complication after penetrating trauma or Intra-ocular surgery.² Predisposing factors for the invasion of epithelial cells from the cornea or conjunctiva into the anterior chamber include multiple intraocular surgeries, incomplete or delayed wound healing, wound fistulae, iris incarceration, vitreous in the wound and implantation of epithelial cells with instruments during surgery. The prognosis of ingrowth depends upon its type. Diffuse epithelial ingrowth is more aggressive, difficult to diagnose and tends to recur after treatment. However, cystic epithelial ingrowth follows a more benign course. It grows slowly and can easily be detected clinically. It also allows for easy surgical removal with a

better prognosis. Histological studies show that the source of epithelial cells is either conjunctiva or cornea.⁴ The presence of goblet cells is diagnostic for conjunctival epithelial ingrowth and also serves to differentiate between the two sources.⁵ Epithelial ingrowth may induce regular or irregular astigmatism with resulting decreased vision. It may also result in melting of cornea due to release of collagenases and proteases from necrotic epithelial cells; and epithelial fistulas may also form at the wound margin. Clinically significant epithelial ingrowth may result in interference with diffusion of nutrients between aqueous and cornea.

Jeffrey Machat classified epithelial ingrowth into three different grades. Grade 1 disease has an epithelial ingrowth of less than 2mm from the edge of the wound or flap with a clear demarcation line between the ingrowth and normal cornea.⁶ Grade 2 disease is similar to Grade 1 with an ingrowth of less than 2 mm but there is no demarcation line. Grade 3 epithelial ingrowth extends upto more than 2 mm from the edge of the wound or flap with associated corneal melting or erosion. Also the cells in Grade 3 appear thicker, more opaque and white than the other stages. Epithelial ingrowth is a commonly encountered complication after photorefractive surgery, especially after Laser-assisted *in situ* keratomileusis. The epithelium grows inwards along the flap edges into the cornea and may extend into the anterior chamber.

Most of the cases of epithelial ingrowth are self-limiting and only need observation while large and aggressive epithelial ingrowth require treatment to overcome irregular astigmatism, corneal melting and ultimately loss of vision. Standard protocol for the treatment of epithelial ingrowth involves lifting and debridement of the flap. Adjunctive treatment such as the use of Mitomycin C, ethanol, photorefractive keratectomy and ND:YAG laser have been successfully used. Fibrin glue has been successfully used to prevent recurrences after the primary ingrowth has been cleared.⁷

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