

Partial Thickness Corneal Patch Graft for a Tunnel Infection Utilizing the Discarded Anterior Cap from an Endothelial Transplant

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Abstract: To report a case of surgical site infection of Phacoemulsification tunnel infection managed with a partial thickness corneal patch graft in a 73 year old patient.

Keywords: Descemet's stripping endothelial keratoplasty, Phacoemulsification, Patch graft, Scleral tunnel

INTRODUCTION

Self-sealing sutureless wound is an important milestone in the advances of cataract surgery. The wound consists of an external incision, an internal incision, and a tunnel joining these 2 incisions. The tunnel varies in length depending on the location and size of the incision. The internal corneal lip closes the wound and prevents egress of fluid from the anterior chamber [1].

However, this wound architecture may leave a potential space if both the roof and floor of the tunnel are not in tight apposition; such a space can lead to the formation of an abscess cavity in the event of infection. This may alter the clinical picture, course of the disease, and the conventional cataract surgery wound [2].

Infectious complications after cataract surgery pose a serious threat to vision. Although the literature contains several reports on postoperative endophthalmitis, there are very few published data on sclera-corneal wound infection. A poorly constructed wound, loose or broken sutures, and associated dacryocystitis have been identified as important predisposing conditions for wound infection [2].

CASE REPORT

A 73 year old man, known diabetic for 10 years with good control of blood sugars, underwent uneventful phacoemulsification with posterior chamber intraocular lens (PCIOL) implantation in his LEFT EYE 3 weeks ago. The surgical wound was a sclerocorneal tunnel constructed superiorly. He was referred to our hospital as Acute Post operative Endophthalmitis with a history of pain, redness, watering for 3 days. At presentation his visual acuity (VA) was counting fingers at 2 meters, diffuse conjunctival congestion and corneal edema with descemet's membrane folds. Anterior chamber had a hypopyon with 4+ flare and cells. PCIOL was in place

with exudates on IOL. B scan showed dense vitritis with increased choroidal thickness.

A diagnosis of acute postoperative endophthalmitis was made. Patient underwent Pars plana vitrectomy and intravitreal intraocular antibiotics (0.1ml Vancomycin, 0.1 ml Amikacin) were injected. Vitreous Biopsy and anterior chamber tap were sent for microbiological evaluation which did not yield any organism on smears and culture subsequently.

On post operative day 1 patient had visual acuity of hand movements and a diffusely congested eye with a membrane in over IOL and no view of posterior segment. He was started on Tab oral Ciprofloxacin 750 mg BD, topical Moxifloxacin 0.5% e/d hourly, topical Homide e/d BD. At this visit there was no infiltrate at the corneo scleral wound

Post-operative day 4 patient had visual acuity of hand movements with an infiltrate at the corneo scleral wound of 2x2mm, deep seated within the tunnel with rounded edges (Image 1). A good fundal glow could be appreciated. At this time the posterior segment infection was responding, while there was a new focus of infection at the corneo scleral tunnel. A tunnel wash was done and sample sent to microbiology. However, No organism and growth was isolated.

Same treatment was continued and patient was reviewed regularly every 15 days. Over the next couple of months there was a gradual reduction of infiltrate size at the wound but with no complete resolution. Visual acuity at 3 months improved to 6/12 with deep seated wound infiltrate. But patient had persistent redness, pain and watering in that period. As there was no complete resolution with medical treatment, to get rid of the infection and to improve patients symptoms surgical excision of the tunnel was planned. A tunnel excision with corneo patch graft was planned. After

excising the tunnel in a circular fashion using a 6 mm size trephine which included some part of cornea and scleral tissue, the residual gap was closed by a corneal patch. The corneal patch was utilized from the remaining anterior cap of the corneal tissue used for endothelial transplant. The posterior portion of the tissue was used for Descemet's stripping endothelial keratoplasty in another patient, while the anterior portion was not discarded and utilised in the above patient. 7 mm size corneal button with punched and secured it to the host cornea using 12 interrupted, 10-0 nylon sutures (Image 2). Postoperatively Anterior chamber was formed, wound stable. Patient was started on topical moxifloxacin hourly and 1% prednisolone acetate every 3 hourly, homide eye drops 2 times/day. Mean while the excised corneo scleral tissue was sent to microbiological and histopathological evaluation. There was no growth from the sample and no organism was seen in pathological slides. Patient was reviewed at 15 days, 1 month, 2 months and 5 months with tapering of steroids. There was no evidence of infection in the post operative period. By 5 months all the sutures were removed and patient had UCVA of 6/6 with complete resolution of his symptoms (Image 3).



Image-1: Corneo-Scleral tunnel infection in the left eye

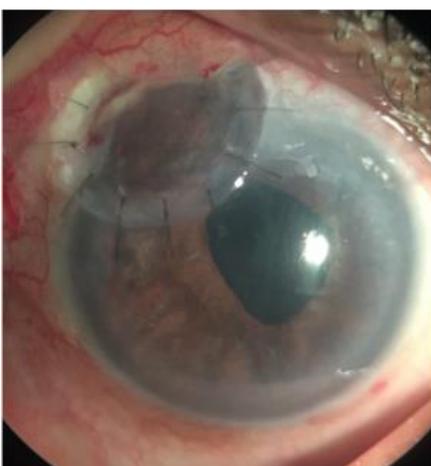


Image-2: Partial thickness corneal patch graft with sutures in place



Image-3: A well taken patch graft, after all the sutures are removed

DISCUSSION

If the cataract incision is inadequate in width and subjected to stretching by surgical instrumentation, it is less likely to maintain its integrity [3]. Tearing at the roof of the tunnel especially at the edges, tearing of the internal lip, epithelial abrasion, prolonged phacoemulsification is potential risks of disturbing wound integrity. Properly performed sclero -corneal tunnels are self-sealing, do not leak when pressure is applied to the dome of the cornea but uniformly leak when pressure is applied to the posterior lip [1].

A leaking tunnel lacks barrier function and the external tissues of most patients harbor organisms capable of causing endophthalmitis, if introduced into the anterior chamber of the eye [4]. In a scleral tunnel incision, the infection located primarily at the external incision may manifest as scleritis whereas an infection located at an internal incision may manifest as keratitis. The sources of microorganisms in self-sealing wound infections are not known but may be similar to those of conventional wound infection and endophthalmitis. Sources of infection described in the literature include the patient's own eyelids and conjunctiva, contaminated instruments, lenses or irrigating solutions, airborne infections, and breaches in the sterile technique [4,5]

Tunnel infections are difficult to treat as variation in clinical presentation poses a diagnostic challenge [2]. There are many case reports on tunnel infections after cataract surgery wherein infectious organism was isolated and managed accordingly, the most common infecting organism being *Staphylococcus epidermidis* [4].

There was a similar case reported which also had a culture negative, deep seated tunnel infection causing recurrent endophthalmitis but responded to subconjunctival injection of vancomycin and an intense and prolonged course of topical antibiotics [6]. Our case was challenging as there was no growth, infiltrate was deep seated, long refractory course of infection not responding to medical management.

A patch graft was planned as the infiltrate was localised, not in the visual axis and complete removal of infected tissue was intended. The infection was successfully managed with no recurrence and with a good visual outcome. The patch graft was done with the remaining anterior cap of the corneal tissue used for endothelial transplant. The posterior portion of the tissue was used for Descemet's stripping endothelial keratoplasty in another patient, while the anterior portion was not discarded and utilised in the above patient. This modality can be effectively done in places where there is shortage of corneal donor tissues thereby saving the corneal tissues.

CONCLUSION

Surgical management of sclero-corneal tunnel infection with partial thickness corneal patch graft has not been reported previously. It is a definitive treatment of localised wound infections wherein globe integrity can be preserved and good visual outcome achieved.

Disclosure Statement

The authors declare that there is no conflict of interest regarding the publication of this paper

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