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Case Report

Late onset endophthalmitis associated with unexposed glaucoma valved drainage device☆

Abdulaziz AlHadlaq[a]; Salem AlMalki[b,*]; Sami AlShahwan[a]

Abstract

We report an extremely rare presentation of late-onset endophthalmitis in a young adult patient with an unexposed Ahmed tube implant. The implant was inserted 11 years prior to presentation. There was no history of trauma or any obvious exposure on clinical examination and the tube plate was filled with purulent material. After aqueous and vitreous tap, the patient underwent intracameral, intravitreal subconjunctival antibiotic injections and was started on systemic antibiotics with good response. Endophthalmitis associated with tube drainage device can present as late as 11 years and even without an unexposed tube.

Keywords: Endophthalmitis, Glaucoma, Ahmed tube implant, Intraocular pressure

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Introduction

Glaucoma drainage implants (GDIs) are often used for controlling intraocular pressure (IOP) in patients with refractory glaucoma. The intraoperative and postoperative complications of GDIs include, infection, hypotony, hyphema, cataract, corneal decompensation and failure to control IOP.[1]

Endophthalmitis is a rare, vision threatening complication of any intraocular surgical procedure. Typically endophthalmitis occurs within days or weeks postoperatively.[1] Late-onset endophthalmitis after GDI has been reported as late as 2 years postoperatively.[2] Late-onset cases of GDI-related endophthalmitis present with an exposed tube or endophthalmitis occurred after needling or repositioning.[3] The incidence of GDI related endophthalmitis in adults in Saudi Arabia is 0.9%.[1] To the best of our knowledge, spontaneous late-onset endophthalmitis past 2 years postoperatively and without exposure of a GDI is extremely rare. We present a case of late onset endophthalmitis of an unexposed GDI more than a decade after the procedure.

Case report

A 28-year-old female presented for routine follow-up to the glaucoma department complaining of blurry vision, redness and pain in her left eye for the preceding 10 days. The patient was already using lubricant eye drops. The patient had undergone uneventful trans-scleral cyclophotocoagulation for high IOP 1 month prior to presentation. At that time the patient was prescribed predforte 1% (Allergan Inc., Dublin, Republic of Ireland) on a tapering dose over 1 month and ofloxacin 0.3% drops four times daily for 2 weeks. The patient was medically healthy but was a documented case of congenital glaucoma. The patient had undergone multiple glaucoma surgeries bilaterally. Surgical history of the right eye included a failed Ahmed glaucoma valve implant

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[a] Glaucoma Division, King Khaled Eye Specialist Hospital, Riyadh, Saudi Arabia
[b] Anterior Segment Division, King Khaled Eye Specialist Hospital, Riyadh, Saudi Arabia

* Corresponding author at: Anterior Segment Division, King Khaled Eye Specialist Hospital, PO Box 7191, Riyadh 11462, Saudi Arabia. Tel.: +966 11 4821234.
e-mail address: smalki@kkesh.med.sa (S. AlMalki).

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followed by a second successful Ahmed glaucoma valve implant five years previously. The left eye had undergone 2 failed trabeculectomies with antimetabolites 15 years previously followed by uncomplicated Ahmed glaucoma valve implantation inferonasally 12 years prior to presentation. On ophthalmic examination her visual acuity was 20/200 and 20/60 in right and left eyes respectively. Intraocular pressures were 16 mmHg and 18 mmHg in right and left eyes respectively. Slit lamp examination of the right eye indicated a clear cornea with deep, quiet anterior chamber and a well-positioned tube with an immature cataract, flat retina and normal lids. The conjunctiva of the left eye was injected especially inferiorly, the cornea was clear, and there were 3+ cells in the anterior chamber, hypopyon surrounding the tube and a hazy view of the vitreous. The left eye had no lid swelling, no tenderness and no exposure from the tube or any leak (Fig. 1). There was minimal vitreous haze and no retinochoroidal layer thickening on B-scan ultrasonography of the left eye.

The patient was diagnosed with early stage endophthalmitis of the left eye and aqueous and vitreous taps were performed. The left eye underwent intracameral, intravitreal and subconjunctival injections of ceftazidime and vancomycin. The patient was prescribed oral ciprofloxacin 400 mg four times a day for 2 weeks in addition to topical steroid four times daily for one week and then tapered to three times a day then twice a day and after that once daily for one week each then it was stopped. Topical antibiotics were prescribed including fortified ceftazidime 50 mg/ml and topical vancomycin 25 mg/ml hourly both for five days and then were changed to topical ofloxacin 4 times a day. Computerized tomography (CT) was performed to rule out paranasal sinus pathology or orbital disease that could explain the source of the unusual inflammation. CT was normal and the aqueous and vitreous samples were negative for any pathogen. The left eye improved over the following days and the patient was discharged after the condition was well-controlled one week after admission. At follow-up, 1 week later, the visual acuity in the left eye was 20/40 with a quiet conjunctiva with no anterior chamber reaction. During examination, we applied external pressure to depress the tube and noted discharge of purulent material from the tube into the anterior chamber (Fig. 2). Hence, we considered the tube the source of infection, most likely from the plate. The tube was examined externally with fluorescein and was negative for leak or exposure. Surgery was performed to completely remove the tube, plate and implant and send them for microbial and cytology analysis. A replacement tube was not implanted. We also requested additional testing for atypical organisms such as mycobacteria. Gross examination of the tube and plate after removal indicated the purulent discharge filled the plate. The microbiology results were negative for bacterial growth and fungal growth. Cytology analysis indicated an acute inflammatory response.

Discussion

Endophthalmitis is one of the most serious complications following intraocular surgery. In the setting of glaucoma surgery, the risk of endophthalmitis extends well beyond the immediate postoperative period. It is critical that both patients and physicians recognize the signs and symptoms of infection, with the understanding that these may present even years after surgery. For example, a retrospective study of Medicare claims data reported the cumulative incidence of endophthalmitis in the first year after glaucoma drainage device (GDD) placement was 0.4%.[4] In the Trabeculectomy-versus-Tube study, endophthalmitis developed in 1 of 107 eyes in the GDI group and 5 of 105 in the trabeculectomy group over 5 years.[2] Hence endophthalmitis presenting years after surgery should be considered in patients with a history of GDI surgery. The majority of GDI-related endophthalmitis is commonly late onset (6 weeks postoperatively or later).[1,2,5]

In a case series of GDI-associated endophthalmitis, tube exposure was present in all cases.[3] However, our case was not associated with obvious tube exposure or conjunctival erosion. Transcleral cyclophotocoagulation (CPC) was performed 1 month prior to presentation and some may question whether this was the inciting event to endophthalmitis. However CPC is a non-invasive procedure that has not been reported to be associated with endophthalmitis. Hence, as the Ahmed glaucoma tube preceded CPC, the most likely explanation is that CPC caused a microerosion, resulting in an invasion of a pathogenic organism from the conjunctival cul-de-sac to the subconjunctival space toward the tube plate and subsequent colonization. *Haemophilus influenzae* and

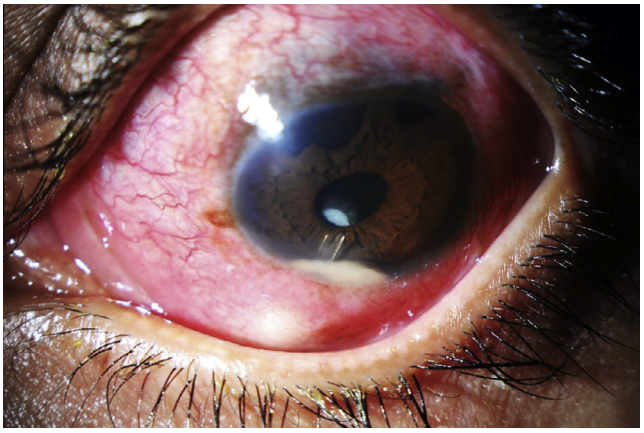

Figure 1. Slit lamp examination of the left eye with conjunctival injection and hypopyon surrounding the tube at initial presentation.

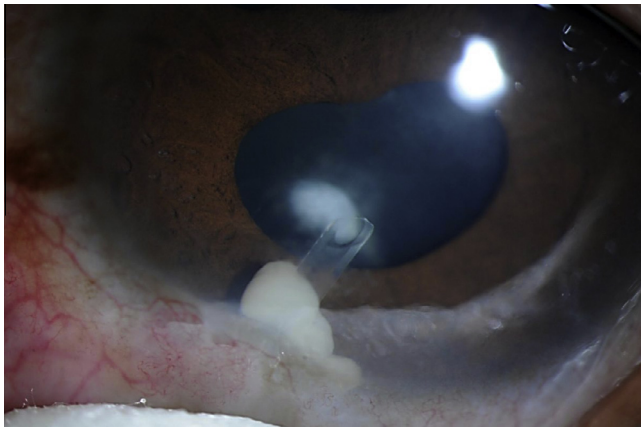

Figure 2. At first follow-up (1 week), vision was 20/40 with a quiet eye. However, during examination purulent material around the tube was noted and, discharge of purulent material from the tube into the anterior chamber was noted when external pressure was applied to the tube.

Streptococcus pneumoniae were isolated in children with Ahmed glaucoma valve-related endophthalmitis in Saudi Arabia.[1] In adults, endophthalmitis related to Ahmed glaucoma valve included Streptococcus species and *Pseudomonas aeruginosa.*[1] Al-Torbak and colleagues have documented that the types of microbes causing GDI-related endophthalmitis are similar in Saudi Arabia and the western hemisphere. Treatment of GDI-related infectious endophthalmitis can range from evisceration to intravitreal antibiotics. Previous studies have recommended shunt removal because it may serve as a reservoir for the pathogen. We elected to remove the Ahmed glaucoma valve because we felt it was the source of the endophthalmitis. However, outcomes for removal of GDI in endophthalmitis remain ambiguous.[1,2]

The culture and the stain results were negative for bacterial and fungal microbes. Cytology analysis indicated an acute inflammatory response. We found that the eye improved with frequent instillation of topical steroids. Taken together, these three observations could indicate sterile endophthalmitis as an alternate possibility. Sterile endophthalmitis has been reported in patients with GDI.[6] Sterile endophthalmitis is an acute intraocular inflammation that either resolves without antibiotics or is culture-proven negative.[7] However even in culture-proven negative cases, empirical treatment with antibiotics covering potential microbes may be judicious.[8]

We believe that this case was either an infection due to an unusual organism that could not be isolated using the usual culture media and the staining techniques or a case of sterile immune response against the tube plate. Whether CPC was the major inciting event and/or trigger remains unknown as there are no similar cases reported in the literature (to the best of knowledge). In conclusion, endophthalmitis in glaucoma drainage device is rare. However, it can present without conjunctival erosion or tube exposure and can present as late as 11 years postoperatively.

Conflict of interest

We have no conflict of interest to declare.

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