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Successfully managed endophthalmitis following strabismus surgery

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Endophthalmitis following strabismus surgery is rare and has been reported to occur in from 1:3,500 to 1:185,000 cases. Severe adverse sequelae, including phthisis bulbi and enucleation, occur often despite early and aggressive treatment. This report describes 3 patients with endophthalmitis following apparently uneventful strabismus surgery by three different surgeons. Infections were aggressively treated. Two patients received intravitreal steroids; all 3 returned to their preoperative baseline visual acuity.

Case Report

Case 1

A healthy 6-year-old boy with intermittent exotropia and right hypertropia underwent strabismus surgery, with no observed complications (Table 1). His baseline visual acuity was 20/20 in each eye. On postoperative day 5, he was seen for a routine postoperative examination and was noted to have right upper eyelid swelling; the examination was otherwise normal. Visual acuity in the right eye was 20/25. Thirteen days postoperatively, the patient reported recurrent right eye swelling (the prior swelling had fully resolved) and a 1-day history of pain and photophobia. Examination was significant for plasmoid aqueous, 4+ anterior chamber cell, and vitreous cell resulting in a minimally visualized optic nerve. Visual acuity in the right eye was counting fingers. B-scan ultrasonography demonstrated moderate opacities, primarily in the anterior vitreous, with an elevated optic disk (Figure 1A-B). In the operating room, he was found to have a dehiscence of the sclera where the Vicryl suture (Ethicon Inc, Somerville, NJ) had been placed for the right superior rectus recession, with an adjacent abscess (Figure 1C). A 25-gauge pars plana vitrectomy was performed, the right superior rectus muscle was reattached, the scleral rupture was repaired,

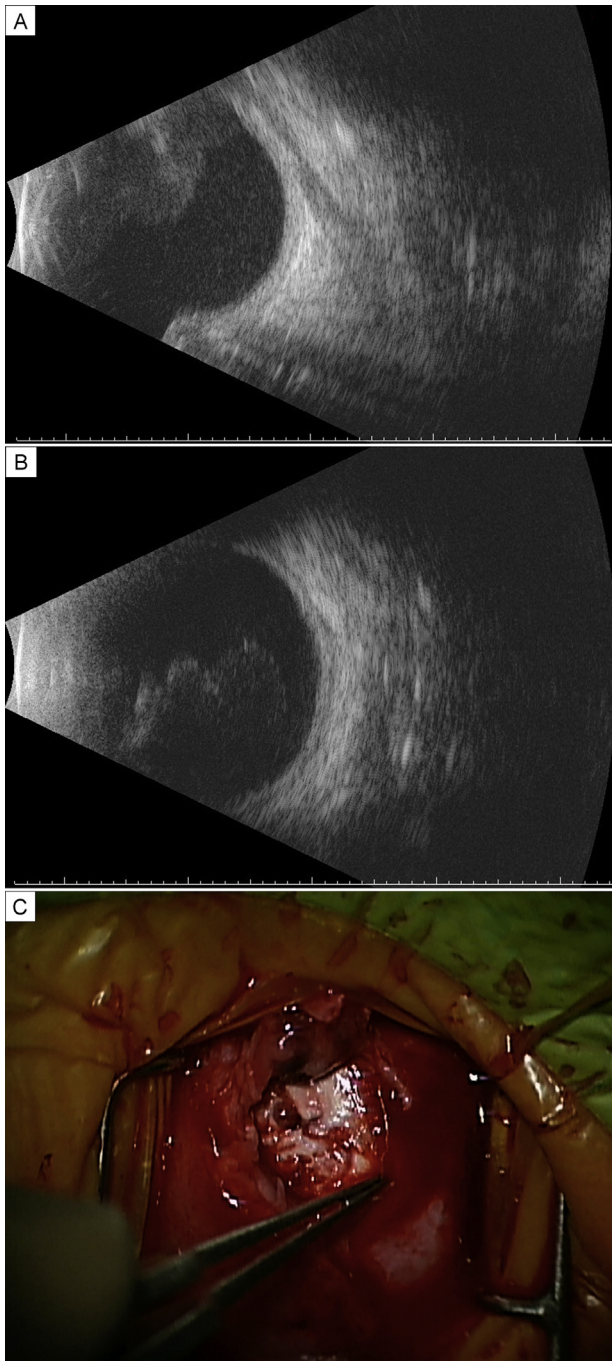

FIG 1. A 6-year-old boy who underwent strabismus surgery was diagnosed with endophthalmitis 13 days postoperatively and found to have full thickness scleral perforation and scleral abscess with dehiscence. A, B-scan ultrasound, longitudinal view, showing anterior vitreal opacities and optic disk elevation. B, B-scan ultrasound, superior transverse view, showing numerous vitreal opacities. C, Dehiscence of the sclera where the Vicryl (Ethicon Inc, Somerville, NJ) suture had been placed for the right superior rectus recession, with an adjacent abscess.

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Table 1. Summary of 3 consecutive patients presenting with endophthalmitis following strabismus surgery

	Case 1	Case 2	Case 3
Age at surgery	6 yrs	20 mos	57 yrs
Surgery performed	6 mm bilat LR recess, 3 mm recess of right SR	6 mm bilat MR recess	4 mm bilat MR, 3 mm right SR recess
Postoperative presentation day	13	3	18
Presumed infection site	Sclera	Sclera and choroid	Sclera and choroid
Culture results	*S. aureus* (scleral Vicryl suture)	*H. influenzae* (Vicryl suture)	*P. aeruginosa* (Vicryl suture and choroidal abscess)
Treatment	25 g PPV, vitreous tap, right SR reattachment, antibiotics,[a] intravitreal steroid	Scleral cutdown, vitreous and AC tap, antibiotics,[b] intravitreal steroid	Scleral cutdown, vitreous and AC tap, unroofing and partial drainage of choroidal abscess, advancement of left MR, antibiotics[c]
Baseline VA	20/20 bilaterally	CSM, both eyes	20/40 right eye, 20/400 left eye
Outcome (final VA in affected eye)	24 mos, 20/20 right eye	18 mos, right eye CSM	11 wks, 20/400 left eye

AC, anterior chamber; *Bilat*, bilateral; *CSM*, central, steady, and maintained; *LR*, lateral rectus muscle; *MR*, medial rectus muscle; *PPV*, pars plana vitrectomy; *Recess*, recession; *SR*, superior rectus muscle; VA, visual acuity.
[a]Intravitreal (ceftazidime, vancomycin), subconjunctival (cephazolin, vancomycin, ceftazidime), intravenous (vancomycin, cefotaxime, oxacillin for 1 day), topical (vancomycin and ceftazidime for 10 days).
[b]Intravitreal (ceftazidime, vancomycin), subconjunctival (cephazolin, ceftazidime), intravenous (vancomycin, cefepime for 4 days), oral (amoxicillin), topical (vancomycin, tobramycin for 2 wks).
[c]Intravitreal (amikacin, vancomycin), subconjunctival (gentamicin), intravenous (meropenem, later switched to aztreonam, for 2 wks), oral (ciprofloxacin for 4 weeks), topical (vancomycin, tobramycin for 2 wks).

and the patient received intravitreal and subconjunctival antibiotics. A repeat B-scan 2 days later demonstrated continued vitreous opacity and optic disk elevation, and the patient received intravitreal dexamethasone (400 mcg) and antibiotics. Cultures of the right eye scleral suture returned positive for *Staphylococcus aureus*; systemic blood cultures were negative. One dose of intravenous antibiotic treatment was given (Table 1). Four weeks later he underwent a lensectomy with an intraocular lens placement for a rapidly developing cataract, with no complications. Twenty-four months later, after prolonged amblyopia therapy, the visual acuity of the right eye returned to 20/20.

Case 2

A 20-month-old boy with history of Down syndrome, hypothyroidism, and a repaired atrial septal defect and patent ductus arteriosus was diagnosed with esotropia, myopia, and nystagmus. On examination, his vision was central, steady, and maintained in both eyes. He underwent uneventful strabismus surgery bilaterally (Table 1). On his routine postoperative examination 3 days later, he was noted to have mild discharge and a dull retinoscopy reflex of the right eye. B-scan ultrasonography showed an elevation of the choroid nasally in the area of the medial rectus recession (Figure 2A-B). Examination revealed a suppurative intraocular reaction, with retinal necrosis and a possible detachment with abscess formation of the choroid. A scleral cutdown, anterior chamber tap, injection of subconjunctival and intravitreal antibiotics, and intravitreal dexamethasone (400 mcg) were performed. Two days later, repeat subconjunctival antibiotics were administered. He also received intravenous antibiotics (4 days). Cultures of the right eye Vicryl stitch were positive for beta-lactamase negative *Haemophilus influenzae*; systemic blood cultures were negative (Table 1). At final follow-up, 1.5 years later, he had normal and equal vision, with moderate myopia and a persistent large-angle esotropia.

Case 3

A 57-year-old man with history significant for choroideremia and colon cancer underwent strabismus surgery for esotropia and hypertropia (Table 1). His baseline visual acuity was 20/40 in the right eye and 20/400 in the left eye from his underlying choroideremia. Eighteen days postoperatively he presented with left eye pain, redness, slightly decreased vision, and reported feeling a cystlike structure nasally. Examination revealed preretinal hemorrhage from 0745 to 0830 at the equator and an apparent choroidal abscess at the location of the inferonasal scleral suture. B-scan ultrasonography showed Tenon's accentuation nasally and a shallow choroidal detachment with a localized retinal detachment or serous elevation (Figure 3A-B). A scleral cutdown, vitreous tap, intravitreal antibiotics, unroofing and partial drainage of the left choroidal abscess (Figure 3C), and disinsertion and advancement of the left medial rectus muscle were performed. Two days later he underwent an anterior chamber tap, and subconjunctival and intravitreal antibiotic injections. Cultures of the left medial rectus suture and choroidal abscess were positive for *Pseudomonas aeruginosa*, although no organisms were isolated from peripheral blood. He was treated with intravenous antibiotics for 2 weeks. His best-corrected visual acuity at 11 weeks' follow-up had returned to baseline in the left eye.

Discussion

Endophthalmitis following strabismus surgery is uncommon, with reported rates ranging from 1:3,500[1] to 1:185,000[2] cases. When present, the infection often results