Rapid onset of orbital cellulitis after uncomplicated strabismus surgery

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Orbital cellulitis is extremely uncommon following strabismus surgery. When it occurs, the infection has been reported to present from day 1 to within 1 week following surgery and has the potential for significant morbidity. We report the case of a 6.5-year-old boy presenting with unilateral orbital cellulitis growing group A *Streptococcus pyogenes* on postoperative day 1, after uncomplicated bilateral medial rectus recessions. The patient had two contacts with streptococcal pharyngitis at the time of surgery but was completely asymptomatic himself. We hypothesize that these contacts may have led to the rapid onset of his orbital cellulitis.

Case Report

A 6.5-year-old boy presented emergently to Boston Children's Hospital with periorbital edema, erythema, and fever on postoperative day 1 after uncomplicated bilateral medial rectus recessions for esotropia. The day prior to presentation, strabismus surgery using a hang-back technique was performed. Sterile procedure was followed. Fornix-based incisions were used, which were closed with interrupted 8-0 polyglactin 910 sutures. The patient was sent home with a 1-week course of dexamethasone/tobramycin ophthalmic ointment 3 times daily for both eyes, per the clinician's standard practice.

Approximately 18 hours after surgery, the patient's family reported mild edema of the left upper and lower eyelids, with yellow discharge from the eyes. By late afternoon, the clinician instructed the family to return to the hospital because of worsening symptoms. A review of systems was positive for recent exposure to streptococcal pharyngitis in his mother, who was currently on antibiotics, as well as his sister, who was positive for streptococcal pharyngitis several days prior to the surgery. In the emergency department, the child was

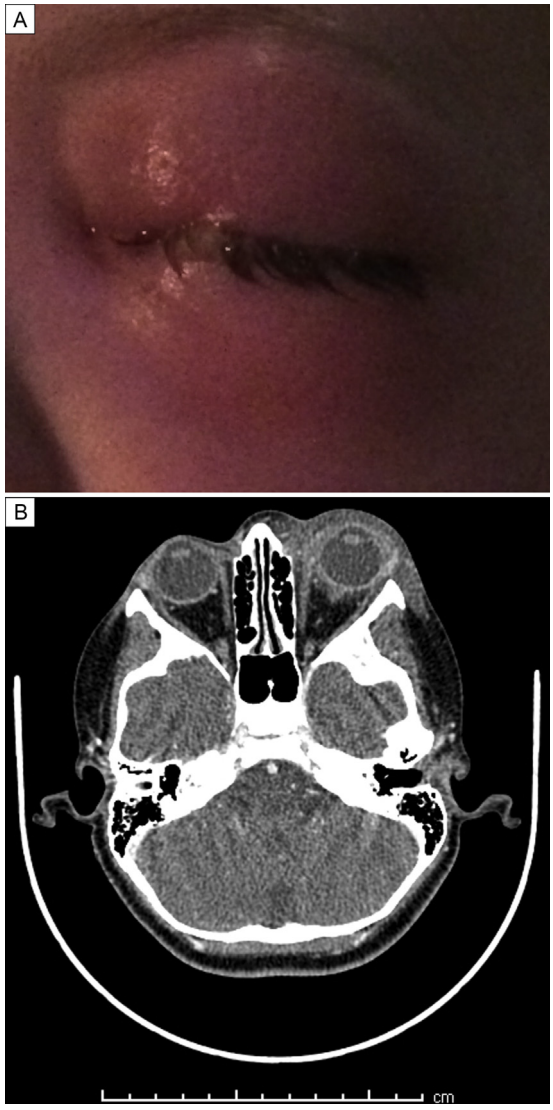

FIG 1. A, Extensive periorbital edema and purulent discharge of the left eye on postoperative day 1. B, Axial computed tomography image of the brain and orbits demonstrating extensive left preseptal and periorbital swelling. There is subtle left postseptal and retrobulbar areas of fat stranding most consistent with an infectious/inflammatory process and less likely postsurgical given the relatively normal appearance of the contralateral side.

febrile to 38.7° C, with white blood cell count of 22.23 mcl, 88% neutrophils, erythrocyte sedimentation rate of 48 mm/hr, and C-reactive protein level of 2.26 mg/liter of blood. The purulent discharge showed gram-positive cocci in chains, and speciated to group A *Streptococcus pyogenes*. The patient was very uncomfortable and required midazolam and haloperidol before the eye examination.

On examination, visual acuity could not be obtained. In the left eye, there was marked erythema and edema of the eyelids (Figure 1A). Copious purulent discharge was noted on the palpebral conjunctiva. There was profound chemosis of the conjunctiva, but the incision appeared intact, without a focal area of chemosis, either in the area of the

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conjunctival suture used to close the fornix incision or the recessed muscle. Pain was noted but was not exacerbated by extraocular movements. The patient could not cooperate with examination of the posterior segment, although a red reflex was present. The right eye demonstrated expected postoperative changes. Pupils were responsive to light, and the anterior segment was clear without hypopyon. There was no proptosis and no foreign body noted.

Orbital computed tomography with contrast showed significant left-sided preseptal inflammation and fat stranding, with subtle inflammation in the retrobulbar and postseptal spaces (Figure 1B). No abscess or sinus disease was identified. These findings showed an acute inflammatory or infectious process predominantly involving the preseptal periorbita but with mild postseptal involvement, consistent with early orbital cellulitis. There was no right eye involvement. The patient was admitted and started on intravenous ampicillin/sulbactam and vancomycin as well as moxifloxacin drops.

The patient responded to treatment rapidly, with improved periorbital edema within 48 hours. Dilated fundus examination was normal. The patient was discharged home by postoperative day 4, on oral amoxicillin/clavulanic acid as well as moxifloxacin drops 4 times per day for 10 days.

The patient continued to improve, and 2 months postoperatively his visual acuity was 20/25 in each eye. He had no nystagmus. Versions showed trace abduction limitation in each eye and esophoria of 2^{Δ} at distance. He was orthophoric at near and in right gaze; there was a small exophoria in left gaze. There was no significant A or V pattern. He had binocular single vision at near—which was the first demonstration of restoration of his binocularity. He was stable at his most recent follow-up examination, 3 years after surgery.

Discussion

The incidence of infections following strabismus surgery is estimated to be between 1/1,100 to 1/1,900 surgeries.[1,2] In a recent single-institution study, postoperative infection after strabismus surgery was noted in 13 of 2,531 patients (incidence of 0.51%).[3] Postoperative endophthalmitis has an estimated incidence of 1/30,000 to 1/180,000, comparatively.[4] In 1995 Kivlin and Wilson[2] surveyed members of the American Association for Pediatric Ophthalmology and Strabismus regarding postoperative infections; of the 25 reported cases of postoperative cellulitis, there was a predominance of preschool aged children and *Staphylococcus aureus* cultures. The survey showed evidence of orbital cellulitis in 17 patients.

Our case showed signs of both preseptal and orbital cellulitis with group A streptococcal-positive cultures after routine uncomplicated medial rectus recessions and is important for two reasons. First, it highlights the importance of suspecting group A streptococcal infections when there is rapid onset of infection and the need to initiate intravenous antibiotics immediately. In this case onset occurred within a day of surgery, which was striking. Kivlin and Wilson[2] noted that all postsurgical infections presented within the first 5 days of surgery but also that many did not present until after the first postoperative visit. Our literature search identified 2 reports of a precipitous onset of orbital cellulitis after strabismus surgery.[5,6] Basheikh and Superstein[5] reported a patient with bilateral, postoperative day 1, group A streptococcal orbital cellulitis. This patient too did not have signs of strep throat at the time of surgery and also had a history of previous orbital surgery.[5] Yau and colleagues[7] described group A streptococcus contributing to the rapid onset of a necrotizing Tenon's capsule after strabismus surgery without frank orbital cellulitis. Second, while group A *S. pyogenes* is a common cause of orbital cellulitis, it is not the most common postoperative organism.[2,3] Moreover, given that the patient had sick contacts with streptococcal pharyngitis at the time of surgery, the pathophysiology of his infection is not straightforward. Streptococcal pharyngitis has been linked to streptococcal orbital myositis,[8] but our patient did not exhibit signs of pharyngitis before or after surgery.

Young age, immunocompromised state, unsuspected sinusitis, eye rubbing, and poor hygiene have been reported as possible risk factors for postoperative infections.[3,4,9,10] We hypothesize that the rapidity of our patient's infection may be secondary to unexpected bacterial colonization from his sick contacts with active streptococcal pharyngitis.

Literature Search

PubMed was searched, without date restriction, on January 1, 2019, using the following terms: *strabismus* AND *cellulitis* as well as *strabismus* AND *infection*.

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