# Subconjunctival abscess formation after strabismus surgery

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**We present 5 cases of postoperative subconjunctival abscesses from two institutions and discuss their outcomes.**

Subconjunctival abscess formation after strabismus surgery is rare. No specific surgical technique appears to be associated with these postoperative abscesses. Methicillin sensitive *Staphylococcus aureus* (MSSA) and group A *Streptococcus pyogenes* dominate as causative organisms, and there does not appear to be a consensus on approaching the patients with intravenous or oral antibiotics. We present 5 cases of subconjunctival abscess following strabismus surgery at two institutions.

## Case Series

Five cases of subconjunctival abscesses after strabismus surgery at Texas Children's Hospital and a private ambulatory surgery center were identified by surgeon self-report. The average age at presentation of abscess was 6 years and 4 months (range, 3-9 years). Patients had undergone surgery for esotropia (2 patients), esotropia with inferior oblique overaction (1), nystagmus (1), and exotropia (1). Surgical techniques included hangback with fornix incision (1 patient) and conventional with fornix incisions (2), limbal incision (1), and fornix and limbal incisions (1). Operative muscles included the medial rectus (6), lateral rectus (4), and inferior oblique (2). Surgery was bilateral in 4 patients.

In all cases surgery was uneventful. The conjunctiva was closed with 6-0 plain gut or 7-0 polyglactin 910 suture in 3 patients, cautery in 1, and without closure in 1. All patients received topical 5% povidone-iodine at beginning and end of procedure. Two patients received intraoperative topical antibiotics (moxifloxacin and neomycin/polymyxin B sulfates/dexamethasone), per surgeon routine. Four patients were prescribed postoperative topical medications (2 neomycin/polymyxin B sulfate/dexamethasone and 2 tobramycin/dexamethasone); 1 patient received no postoperative medications.

Symptom onset occurred on postoperative day 0 in 1 patient, day 1 in 2 patients, and day 3 in 2. Systemic symptoms included nausea/vomiting (2) and fever (2). Ocular symptoms included pain (1), lid edema (3), conjunctival injection (5), chemosis/elevation (5), discharge (3), and limitation of eye movement (2). See Figure 1. Only one eye was affected in all cases.

Two patients received oral antibiotics and 3 were admitted for intravenous antibiotics, one after worsening on oral antibiotics. One patient underwent computed tomography (CT), which revealed no definitive evidence of orbital cellulitis or abscess. All 5 patients underwent abscess incision and drainage (I&D). This was performed on day 2 (1 patient), day 4 (2), day 6 (1), and day 7 (1). See Figure 2. Two cases were associated with limbal incisions and 3 with fornix incisions. Affected muscles were the lateral rectus (2), medial rectus (2), and inferior oblique (1). The inferior pole of the medial rectus muscle was slipped on the side of the abscess in 2 patients. Intraoperative cultures revealed MSSA in 2 patients, group A *Streptococcus* in 2, and was negative in 1. All patients were discharged on oral antibiotics (2 cephalexin, 1 cefaclor, 2 amoxicillin) and topical medication (1 prednisolone, 1 fortified vancomycin, 3 moxifloxacin).

Infection resolved in all patients; no patient suffered loss of vision or endophthalmitis. Four achieved excellent alignment without additional surgery. One patient, who had a slipped medial rectus muscle, developed consecutive exotropia which improved with advancement of the medial rectus. One patient developed a pyogenic granuloma after I&D which resolved with topical steroid.

## Discussion

Infection following strabismus surgery is rare. There are 5 separate cases of pediatric subconjunctival or sub-Tenon's abscesses reported in the literature.[1-5] To our knowledge, though, this is the first case series that considers only subconjunctival abscess after strabismus surgery. One survey estimated the incidence of cellulitis and subconjunctival abscesses after strabismus surgery to be 1:1900 and endophthalmitis to be 1:30,000.[6] Another survey on infection after strabismus surgery reported 25 cases of cellulitis and 3 cases of subconjunctival abscess.[7] A retrospective review of 9,111 strabismus surgeries at a single institution found the incidence of postoperative infection to be 0.14%, with only one subconjunctival abscess.[8]

In a large retrospective study, no difference was found between the postoperative infection rate following one-time topical povidone-iodine and 1-week course of topical

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**FIG 1.** Presentation of patient on postoperative day 1, with conjunctival injection, chemosis, and discharge.

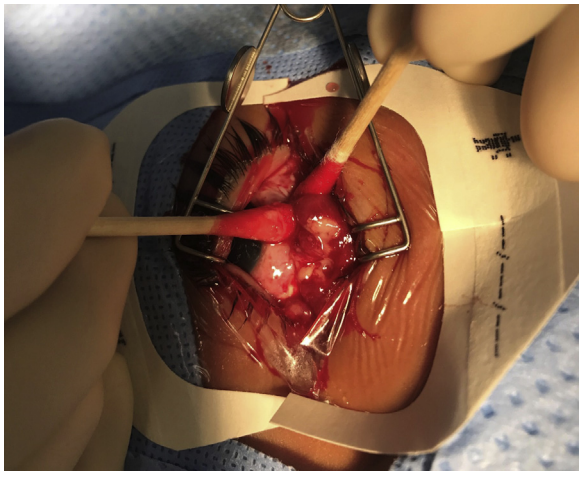

**FIG 2.** Intraoperative photograph of subconjunctival abscess at time of surgical drainage.

antibiotic/steroid. This study also found limbal incisions and reoperations had a higher likelihood of developing a postoperative infection.[9] In the previously reported cases of subconjunctival or sub-Tenon's abscess, all patients were given povidone-iodine at the end of surgery and topical antibiotic-steroid in the postoperative period.[1-4,8] Similarly, in our study, povidone-iodine 5% was applied at the end of surgery in all cases and postoperative topical antibiotic steroid drops were administered in 4 of the 5 cases. None of the cases in our series had previous history of eye surgery, and abscess development occurred with both fornix and limbal incisions.

In our series, symptom onset was within 3 days of surgery, similar to the reported times in the literature.[1-4] Although the 5 cases in our series developed an infection in a single eye, 2 bilateral cases have been reported.[2,3] Initial presentation in all reported cases included lid edema, pain, chemosis, injection, discharge, limited motility, nausea, and fever.

CT was obtained in 1 patient in our series, with no orbital abscess identified. In the 5 previously reported cases, CT or magnetic resonance imaging was performed in 4 of 5 cases.[1-4] Orbital cellulitis was found in 2 cases[2,4]; imaging revealed pansinusitis[6] in one patient and both dacryoadenitis and subperiosteal abscess[4] in another.

Three of our patients received intravenous antibiotics; all 5 underwent drainage of the abscesses by day 7. Cultures revealed MSSA in 2 cases, group A *S. pyogenes* in 2, and no organism in 1. In the 4/5 cases in the literature, abscess drainage occurred in a similar time frame (days 1, 3, 4, 8).[1-4] Four patients received intravenous antibiotics and 1 received oral antibiotics only; cultures were positive for MSSA in 3, methicillin-resistant staphylococcus aureus in 1, and group A *S. pyogenes* in 1.[1-5]

A partially slipped muscle occurred in 2 cases in our series in the area of abscess. In one case, the slipped pole was secured to the central knot, and the patient achieved acceptable postoperative alignment; the other patient underwent muscle advancement at a later date. In both cases, scleral passes were avoided during I&D because of concern for increased infection risk. Kothari and Sukri[3] reported a slipped muscle and cheese wired muscle associated with abscesses which were both reinserted to the sclera during I&D without complication.

Resolution of the infection occurred postoperatively in all 5 cases in our series and the 5 case reports reviewed. Vision was unchanged compared to preoperative values, and all patents ultimately achieved good alignment. No patient suffered endophthalmitis or other complications.

In conclusion, patients with subconjunctival abscesses generally report symptoms within 3 days of surgery. Imaging is not necessary in these cases but should be ordered if there are orbital signs or concern for orbital cellulitis. A high index of suspicion for subconjunctival abscesses with prompt intervention including antibiotics and early incision and drainage can yield good outcomes.

## Literature Search

PubMed was searched on July 18, 2018, without date or language restriction, using the following terms: *abscess* AND *strabismus surgery*, *complications* AND *strabismus*, *infection* AND *strabismus*.

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# Childhood glaucoma in association with congenital disorder of glycosylation caused by mutations in fucosyltransferase 8

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**A rare form of congenital disorder of glycosylation (CDG) was recently discovered in individuals with biallelic mutations in fucosyltransferase 8 (*FUT8*). The clinical characteristics of patients with *FUT8*-CDG include intrauterine growth retardation, feeding difficulties, hypotonia, microcephaly, seizures, short stature, developmental delay, and respiratory abnormalities. We report the first case of glaucoma in an infant with *FUT8*-CGD and hypothesize a pathogenesis for glaucoma.**

## Case Report

A 5-month-old girl was referred to our pediatric ophthalmology clinic at the University of Minnesota for evaluation of tearing, photosensitivity, and possible congenital glaucoma. Her past medical history included intrauterine growth retardation, seizures, hypotonia, facial dysmorphism, feeding difficulties, respiratory disease, and developmental delays. The patient had been recently diagnosed with *FUT8*-CGD after whole exome sequencing identified 2 variants in *FUT8* (c.1009C>G p.Arg337Gly within exon 8 and a c.1259+5G>T splice site variant within intron 9), and functional studies showed a complete lack of *FUT8* protein and loss of core fucosylation. There were no pathogenic variants in *CYP1B1*, *LTBP2*, or *TEK*, genes associated with infantile glaucoma.

On first examination, her vision was central, steady, and maintained in both eyes. Pupils and ocular motility were normal. The cornea of the right eye was clear. The left eye appeared buphthalmic, with a diffusely hazy cornea. Intraocular pressure (IOP) measured using the iCare tonometer (Icare Finland Oy, Vantaa, Finland) was 16 mm Hg in the right eye and 21 mm Hg in the left eye. Dilated fundus examination revealed a cup:disk ratio of 0.25 in the right eye and 0.45 in the left eye. Cycloplegic refraction was –1.00 sphere in the right eye and –1.50 sphere in the left eye.

Examination under anesthesia was recommended. The patient was dilated with a mixture of cyclopentolate 1.3%, tropicamide 0.17%, and phenylephrine 1.7%. IOP measured with Tono-Pen (Reichert Technologies, Depew, NY) was 18 mm Hg in the right eye and 36 mm Hg in the left eye immediately on induction of general anesthesia. Corneal diameters were 11.5 × 11.5 mm in the right eye and 12.5 × 12.5 mm in the left eye. Central corneal thickness was 538 $\mu$m in the right eye and 624 $\mu$m in the left eye. Axial length was 20.75 mm in the right eye and 22.57 mm in the left eye. Anterior segment examination of the right eye was unremarkable. Gonioscopy of the right eye revealed an immature angle with prominent radial iris angle vessels and a high iris insertion. The trabecular meshwork was not clearly defined. Indirect ophthalmoscopy revealed a normal macula and optic nerve, and a cup:disk ratio of 0.2. Anterior segment examination of the left eye revealed a notably buphthalmic eye with diffuse corneal edema, preventing a view of the angle on attempted gonioscopy. Indirect ophthalmoscopy revealed normal macula and vessels. There was an optic cup:disk ratio of 0.4.

A temporal Harms trabeculotomy was performed in the left eye. After surgery, the IOP improved to 21 mm Hg, and the corneal edema cleared, but the IOP increased to 29 mm Hg 1 year later. The patient was started on brinzolamide ophthalmic suspension 1% three times daily, and IOP was maintained below 24 mm Hg. The IOP of the right eye remained normal without treatment. Amblyopia of the left eye was detected 3 months after surgery. Cycloplegic refraction indicated significant anisometropia (right, −1.25 + 1.25 ×120; left, −4.50 +1.00 ×45); the patient was treated with glasses and part-time patching until her death due to respiratory complications at 3 years of age.

## Discussion

The *FUT8* gene is widely expressed in mammalian tissues and catalyzes the core fucosylation of N-glycans in the biosynthesis of glycoproteins. Core fucosylation has been

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