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Can J Ophthalmol 2016;51:e58–e60

http://dx.doi.org/10.1016/j.jcjo.2015.12.004

Orbital cellulitis and multiple abscess formation after strabismus surgery

A 3-year-old female underwent bilateral lateral rectus recessions of 7.0 mm for an intermittent exotropia of 35 prism diopters (PD). Her ocular history was significant for left amblyopia. She was known for a history of bilateral mastoiditis and recurrent episodes of acute otitis media. There was no history of upper respiratory tract infection before surgery.

Preoperatively, the patient's face was prepped with 10% povidone solution, and 5% povidone drops were instilled in both eyes. The lateral recti were approached through limbal conjunctival incisions, which were closed postoperatively using 8-0 polyglactin sutures. Dexamethasone and tobramycin ointments were instilled in both eyes at the conclusion of surgery. The patient was using tobramycin drops three times daily in both eyes postoperatively.

The patient presented on the third day postoperatively with left periorbital swelling, redness, and pain. She was afebrile. Best-corrected visual acuity was 20/20 in the right eye and 20/30 in the left eye, consistent with the patient's baseline status. There was a moderate left abduction deficit. Slit lamp examination revealed an abscess collection in the left temporal quadrant of the conjunctiva. There was no relative afferent pupillary defect. Dilated fundus examination was unremarkable. Magnetic resonance imaging of the orbits (Fig. 1) revealed a left lateral extraconal abscess collection, as well as inflammatory changes involving the left lateral rectus and the lacrimal gland, with enlargement of the latter. There was a small T2 hyperintense signal adjacent to the medial aspect of the left lateral bony orbit corresponding to a subperiosteal abscess, with no associated sinusitis. The infectious diseases service was consulted, and the patient was admitted to the medicine ward for intravenous pipercillin–tazobactam and vancomycin. There was no significant improvement, and the patient was taken 5 days after admission for drainage of the subconjunctival collection (Fig. 2). Cultures came back positive for methicillin-sensitive *Staphylococcus aureus*. Serial examinations revealed improvement in extraocular motility. One-week follow-up revealed a consecutive esotropia of 8 PD in the primary position at distance and near. The patient completed a 3-week course of intravenous ceftriaxone, topical erythromycin and ofloxacin, and did well on follow-up. There was slow resolution of the periorbital edema and return of full extraocular motility. At 6 months, she had a small consecutive esotropia of 6 PD.

Given the patient's history of mastoiditis and abscess formation, the possibility of innate deficiencies of the immune system was entertained. However, complement function, di-hydroamine 123 (for chronic granulomatous disease) and leukocyte surface glycoprotein (LFA-1) testing (for leukocyte adhesion deficiency) were normal.

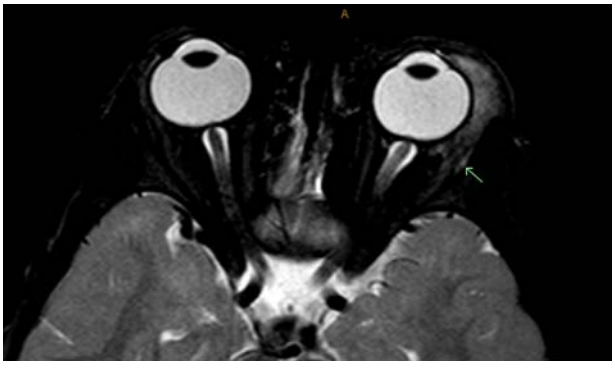

Fig. 1—T2 gadolinium-enhanced axial slice through the orbits demonstrating a small left subperiosteal abscess collection (arrow).

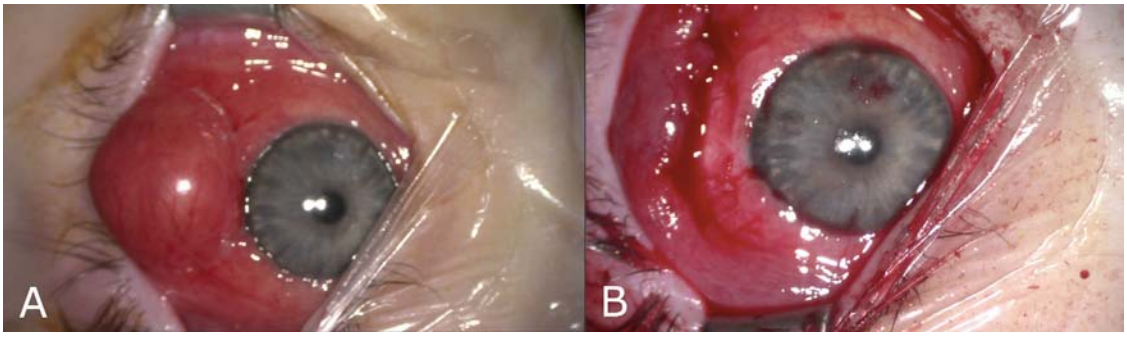

Fig. 2—Intraoperative appearance of the patient's subconjunctival abscess collection. Before (A) and after (B) incision and drainage.

Discussion

Periocular infections after strabismus surgery include orbital cellulitis, subconjunctival and sub-Tenon's abscesses, as well as endophthalmitis. Orbital cellulitis is an exceedingly rare but potentially devastating complication of strabismus surgery. Kivlin and Wilson Jr. reported 25 cases from a physician survey; only 17 had deep orbital infection and/or imaging consistent with orbital cellulitis.[1] The incidence of periocular infection is assumed to be between 1 in 1100[1] and 1 in 1900.[2] While antibiotic prophylaxis intra- and postoperatively is not universally used, some authors have advocated routine administration of povidone-iodine in the fornix.[3]

Orbital cellulitis is a well-established complication of strabismus surgery.[4–8] However, abscess formation, whether in the intraconal, extraconal, sub-Tenon's, subconjunctival, or subperiosteal spaces, is rare. Although postoperative abscess formation has been previously reported,[9,10] this is the first reported case of the formation of multiple distinct abscesses and dacryoadenitis after strabismus surgery. This is also the first reported case of orbital cellulitis with subperiosteal abscess formation after routine strabismus surgery.

In Kivlin's series, the most common isolated pathogen was *S. aureus* as was the case in our patient.[1] It is difficult to predict the source of infection in our case. Our patient had no sinusitis on the involved side. The possibility of surgical-site contamination is remote; the same instruments were used for both sides, and the right eye was operated first. The patient was prepped appropriately preoperatively and there was no break in sterile technique.

Uncomplicated orbital cellulitis can usually be managed medically with intravenous antibiotics, and close observation. Our patient's lack of improvement with medical therapy prompted drainage of the subconjunctival abscess. A subperiosteal abscess in children younger than 9 years does not usually require drainage unless there are visually threatening signs on examination.[11] Our patient's speedy recovery after surgical drainage highlights the importance of timely diagnosis and intervention.

Orbital cellulitis is a known rare complication of strabismus surgery. The formation of multiple abscesses may further complicate the management of those cases. Rapid recognition and management of orbital cellulitis postoperatively can save the patient significant visual morbidity and potential mortality.

Disclosure: The authors have no proprietary or commercial interest in any materials discussed in this article.

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Can J Ophthalmol 2016;51:e60–e61
0008-4182/16/$-see front matter
http://dx.doi.org/10.1016/j.jcjo.2015.12.006

Optical coherence tomography angiography of a retinal astrocytic hamartoma

Retinal astrocytic hamartomas are rare, benign glial tumours that most commonly accompany tuberous sclerosis complex but may occur with neurofibromatosis type 1 or as isolated cases. We present a case of an isolated retinal astrocytic hamartoma, evaluated with multimodal imaging including spectral domain optical coherence tomography (SD-OCT), en face OCT, and OCT angiography. OCT angiography is a novel, noninvasive method for analyzing the retinal capillary system. This modality revealed a central feeder vessel with an associated abnormal vascular plexus, which correlated with the topographic location of the tumour on en face OCT. This is the first report on the use of OCT angiography to characterize an astrocytic hamartoma and its associated vasculature.

A 49-year-old female with a history of diabetic retinopathy was referred for an incidental retinal lesion in the right eye. The patient had no related history of tuberous sclerosis complex or neurofibromatosis type 1. Visual acuity with correction was 20/40 OD and 20/25 OS. Retinal examination revealed a flat, grey-white, opalescent lesion with ill-defined borders in the superotemporal macula of the right eye (Fig. 1A, B). Scattered retinal microaneurysms consistent with mild nonproliferative diabetic retinopathy were noted bilaterally.

Fluorescein angiography demonstrated minimal hyperfluorescence of the lesion during the filling phase and mild late staining (Fig. 1C, D). SD-OCT demonstrated marked nerve fibre layer thickening with preservation of the underlying layers (Fig. 2A, B). The lesion gradually transitioned to the surrounding tissue, without evidence of retinal traction or calcification.

OCT angiography was obtained using RTVue XR Avanti with Angiovue (Optovue, Inc, Fremont, California, USA.) and enhanced with split-spectrum amplitude decorrelation angiography and motion correction software. Segmentation parameters were adjusted to transect the deep capillary plexus with the upper offset at −82 μm and the

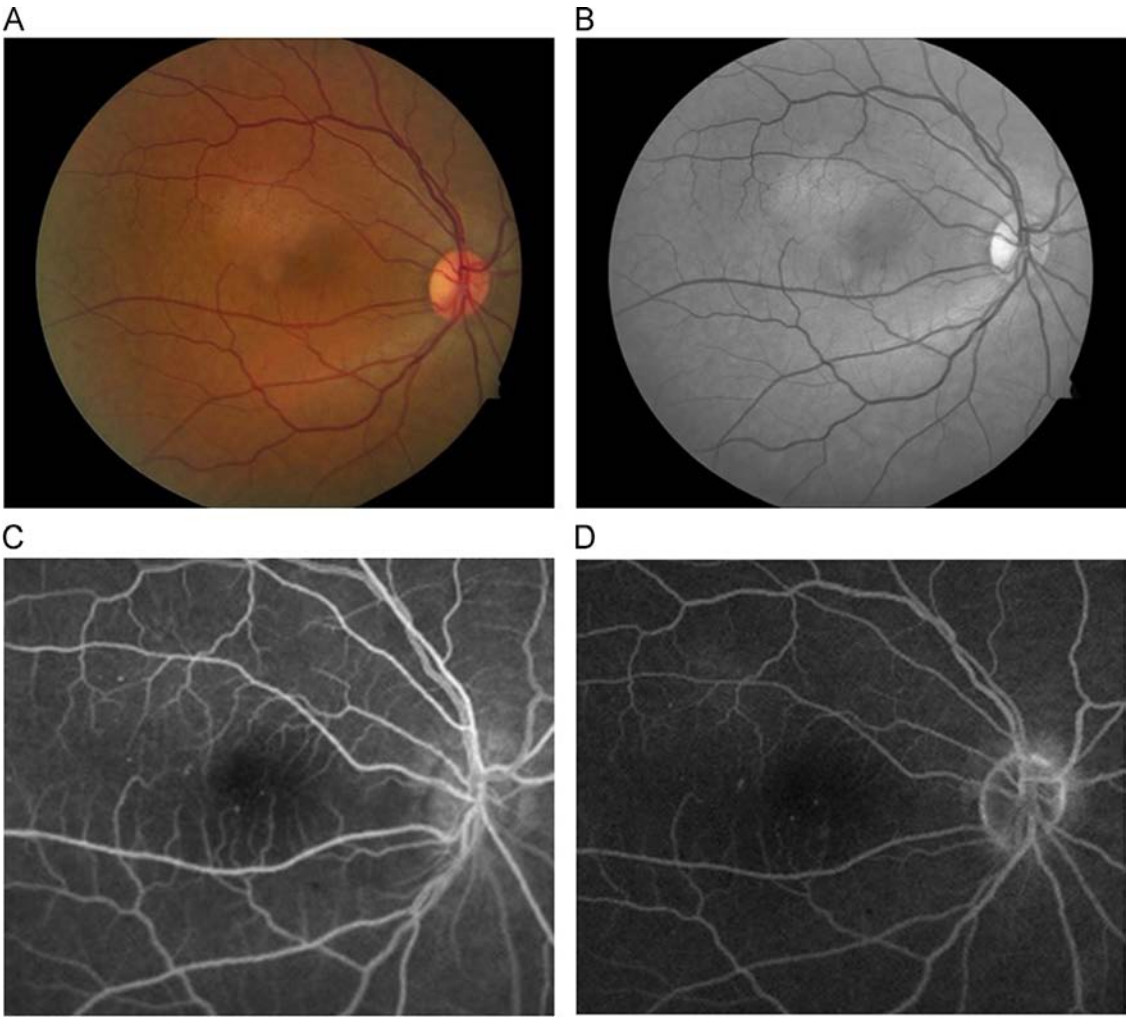

Fig. 1—Multimodal imaging findings of a retinal astrocytic hamartoma. (A) Colour fundus photography and (B) red-free fundus photography of the right eye show a grey-white lesion with ill-defined borders superotemporal to the fovea. (C) Fluorescein angiography shows minimal hyperfluorescence at 25 seconds and (D) minimal late staining at 5 minutes and 37 seconds.