

## Case Report

# Orbital Cellulitis and Sub-Tenon's Abscess Following Strabismus Surgery in a Healthy Child: The Challenge of Identifying the Source of Infection

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**Abstract**

Serious infection is uncommon following strabismus surgery. In this paper we report the case of a 6-year-old boy who developed severe unilateral orbital cellulitis with sub-Tenon's abscess and concomitant bilateral maxillary and ethmoidal sinusitis, which required hospitalization. Contrary to statistics, in this case sinusitis couldn't be implicated in causing ocular process. Importance should be given to detailed anamnesis, complementary exams and the involvement of a multidisciplinary team for the diagnosis of contamination by nonhygienic care how the probable source of infection.

**INTRODUCTION**

Orbital cellulitis is unusual after strabismus surgery, being distinguished from pre-septal cellulitis by the presence of infection in the tissues posterior to the orbital septum, restricted motility of eye, pain, proptosis, visual impairment, afferent pupillary defect and fever. In children, the presence of orbital cellulitis is a potentially fatal emergency that requires hospitalization and intravenous antibiotics treatment. Besides that, periodic ophthalmologic examination, cultures and imaging exams are also necessary for the best management of the disease [1,2].

**CASE PRESENTATION**

A healthy patient presented to Hospital Regional da Asa Norte (HRAN), Brasília, Distrito Federal with basic exotropia of 40 prism diopters (PD), measured by an alternating prism

cover test. Hyperfunction of the four oblique muscles and an "X" pattern deviation were detected on motility testing. The ophthalmological examination revealed a 1.0 visual acuity in both eyes (performed with the Snellen Chart), cycloplegic retinoscopy of -0.25 and normal biomicroscopic and fundus evaluation. After follow-up and deviation measurements, surgery was indicated.

The surgery was performed under general anesthesia and consisted of an 11 mm bilateral lateral rectus recession. Preoperative asepsis was performed with Povidone- iodine 10% solution in the skin and Povidone-iodine 5% for both eyes and culs-de-sac. The right eye was operated on first, and the same surgical instruments and antiseptic solution were used for both eyes. Surgery was uneventful.

On the first postoperative day the child was orthophoric, had no complaints and presented subconjunctival hemorrhage as expected. Eye drops (Ciprofloxacin Hydrochloride and

Dexamethasone; Maxiflox D® were prescribed every 4 hours for seven days.

On the third day after surgery, fever, lethargy, swelling, redness and pain in his right eye were reported. Immediate return to hospital was indicated, where right eyelid swelling, conjunctival edema, hyperemia, restricted ocular motility and visual acuity 0.3 in the right eye were observed (Figure 1). There was no afferent pupillary defect or modification on fundus exam.

Orbital contrast-enhanced computed tomography (CT), showed right soft tissue densification with extension to post septal fat and hypodense collection (volume of 0.3 ml). In addition, a moderate mucous thickening in the maxillary and ethmoidal sinuses was suggestive of sinusopathy. The extrinsic musculature was of usual appearance. There was no left eye involvement. Neutrophilia was detected (14,600 cells/ml). Given the findings, the diagnosis of unilateral orbital cellulitis with acute sinus disease was presumed. The patient was hospitalized and received ampicillin-sulbactam IV, dexamethasone IV and local warm compresses.

Despite CT findings, the patient did not complain of nasal discharge or symptoms related to sinusitis. A nasal endoscopy showed moderate diffuse hyaline mucoid secretion, free sphenoethmoidal recesses, lower and middle meatus, without mucosal edema. In conclusion, the examination eliminated the possibility of sinusitis.

A review of the patient's clinical history showed he was constantly holding a "security blanket" to help him sleep and that he also used it to clean his eyes, and the fact that this blanket was not cleaned properly during the two postoperative days raised the possibility of contamination by nonhygienic care.

On the third day of hospitalization, the patient showed signs of improved visual acuity (1.0 AO), but continued showing limited abduction of the right eye. A biomicroscopy revealed the presence of sub-Tenon's temporal abscess (Figure 2). We decided to perform abscess drainage under sedation and local anesthesia, with abundant yellowish sub-Tenon's discharge. The collection was anterior to the muscle fixation point and did not affect the lateral rectus.

After 7 days of venous antibiotic a significant improvement was noticed (visual acuity 1.0 and similar small abduction restriction AO). The causative organism, found by culture and antibiogram of drained secretion of the abscess, revealed *Staphylococcus aureus* beta lactamase positive resistant to Penicillin, Ampicillin and Tetracycline. Hence, the patient was discharged with a prescription for the oral antibiotic Amoxicillin and Clavulanic Acid (Clavulin BD), every 12 hours and Prednisone for 7 days.

Two months later the family was satisfied, and the patient was orthophoric, with normal ductions and visual acuity; however, he still had a mild hyperemia in the area of the abscess (Figure 3).

## DISCUSSION

To the best of our knowledge, this is the first case report of unilateral orbital cellulitis and sub-Tenon's abscess with bilateral



**Figure 1** (A,B): D3 of postoperative strabismus surgery (D1 of Hospitalization).



**Figure 2** (A,B): Sub-Tenon's temporal abscess (D3 of Hospitalization).



**Figure 3** Follow up, 2 months after strabismus surgery.

asymptomatic sinusitis, in which otolaryngologic findings were not implicated as the primary source of the ocular inflammatory process.

Periocular infections after strabismus surgery are rare [3-5]. However, without a prompt diagnosis and appropriate treatment, the prognosis of orbital cellulitis can be very bleak, ranging

from optic neuropathy and visual loss to blindness, intracranial abscesses, sepsis and death [4,6,7].

Orbital cellulitis usually occurs within the first 2-4 postoperative days [3,8]. Identification of the microorganisms involved is difficult due to the physiological microbiota of the area, previous use of antibiotics and multiple potentially causative agents [3,4,6,9-11].

The most implicated agents (*Staphylococcus aureus* and *Streptococcus epidermidis*) [3,4,6,9,10], are identified through minimally invasive techniques (such as an abscess culture) with a higher percentage of positive results than those obtained through blood culture [6,11].

Sinusitis, periocular trauma and history of ocular or periocular conditions are the main causes of orbital cellulites [6,9]. In general, rhinosinusitis is associated with orbital cellulitis in 66-82% of the cases [7]. However, differential diagnosis is challenging [3,12], because it is well known that sinus mucosal thickening is commonly found incidentally in asymptomatic children and usually doesn't require treatment [3]. Moreover, in most cases the primary source of the infection cannot be determined, as several factors may be involved: intraoperative contamination, self-contamination as a result of bad hygiene, as well as a concomitant unsuspected sinus disease [9].

In the current case, three possible predisposing factors were detected: the presence of asymptomatic sinusitis, surgical trauma, and poor hygiene.

Unfortunately, a nasal swab was not performed which is a flaw in the case description. However, the report of innocent nasal endoscopy associated with frequent contact with a potentially contaminated object and uneventful surgery led us to believe that the primary source of infection was poor postoperative hygiene.

Such presentation alerted us to the need of approaching personal care in a different way. From this report we include in the postoperative guidelines specific care with personal objects (such as security blankets, cloth toys, plush toys, etc.).

Additionally, clinical history findings, associated with complementary nasal endoscopy, were helpful in the differential diagnosis of the possible primary source.

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