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Clinical Case Reports

Subperiosteal Orbital Abscess: Case Report

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Abstract:

Subperiosteal orbital abscess is a well-described infectious process that affects the bones supporting the globe. It can induce rapid bone degradation and invasive extension.

A 45-year-old male with surgical history of submandibular gland excision presented in our department with left-sided periorbital edema and decreased ocular movements. He complained of reduced visual acuity and inflammation. CT scan of orbits and paranasal sinuses showed a filled left ethmoidal sinus and same density material, located in subperiosteal space of left orbit, displacing the globe inferiorly and anteriorly. Because of the fast spread of the disease, the patient was managed by prompt combination of intravenous antibiotic therapy associated to surgical drainage.

In this manuscript, we try to describe this case in order to optimize the therapy results and reduce alarming complications of the disease.

Introduction:

Orbital sinus complications have been known for more than 60 years. The infection can occur in any intra-orbital area, however it usually affects retro-ocular soft tissues, including the muscle cone. Orbital cellulitis and abscess occur due to the extent of infection of neighboring tissues, trauma or less frequently hematogenous. Subperiosteal abscess usually happens due to ethmoidal sinus disease because papyraceous lamina is thin and constitutes a fragile barrier for the spread of infections[1].

The orbital abscess requires timely and effective treatment because of its morbidity[2]. Effective antibiotic treatments according to bacterial culture can reduce the complications of the disease[3].

Complications includes visual loss, endophthalmitis, cavernous sinus thrombosis, intracranial spread (meningitis, cerebitis, brain abscess) and death[4].

The aim of this report is to highlight the necessity of a rapid diagnosis and surgical approach when subperiosteal orbital abscess is suspected.

Case description:

A 45-year-old male with surgical history of submandibular gland excision presented with periorbital edema and decreased ocular movements in the left eye (LE) **(Figure 1)**.

Figure 1. Clinical presentation of orbital abscess

He complained of reduced visual acuity and inflammation in LE for the past 04 days. Best corrected visual acuity (BCVA) was 04/10 in the LE and 10/10 in the Right eye (RE). LE presented intense chemosis, proptosis, exophthalmia, along with difficult evaluation of ocular movements due to periorbital edema and pain. Ophthalmological examination revealed transparent cornea, wide anterior chamber, and a regular photomotor reflex. The patient had neutrophilia, and Computed tomography (CT) of orbits and paranasal sinuses showed a filled left ethmoidal sinus and same density material, was located in subperiosteal space of left orbit roof, and displacing the globe inferiorly and anteriorly **(Figures 2).**

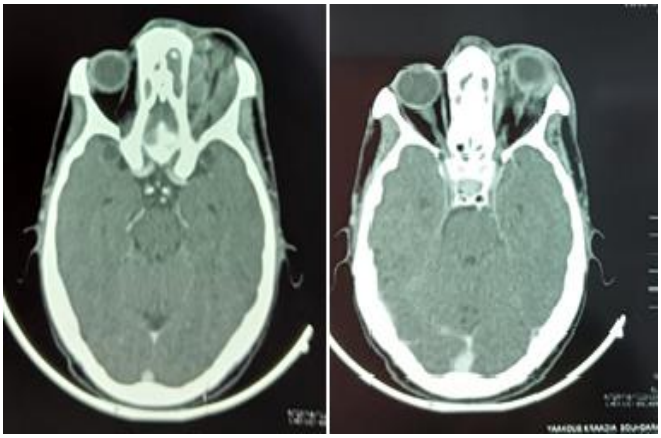

Figure 2. CT scan of orbits and paranasal sinuses revealing a filled left ethmoidal sinus and same density material, located in subperiosteal space of left orbit roof, displacing the globe inferiorly and anteriorly

The patient was started on parenteral antibiotic combination therapy of Claforan, Flagyl and Gentamicin. 72 hours later, due to the non-clinical improvement, we decided to proceed to a surgical drainage of the subperiosteal abscess using an external skin approach (modified Lynch approach) (**Figure 3, 4, 5 and 6)**. A parenteral antibiotic therapy wad maintened for 10 days.

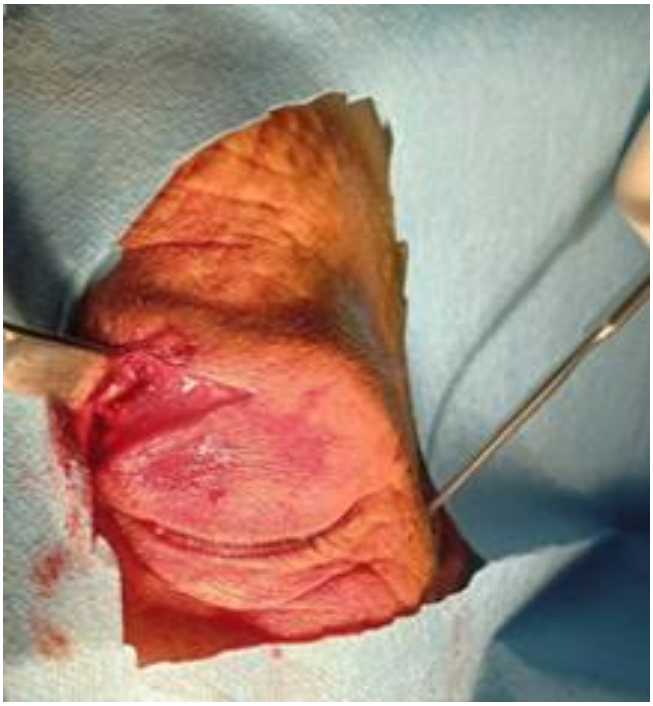

Figure 3. Skin incision

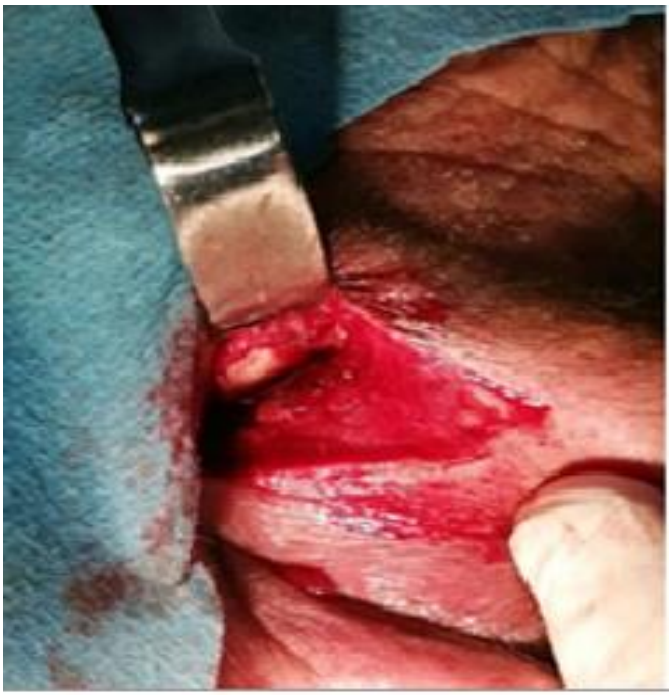

Figure 4. Dissection is carried down to periosteum

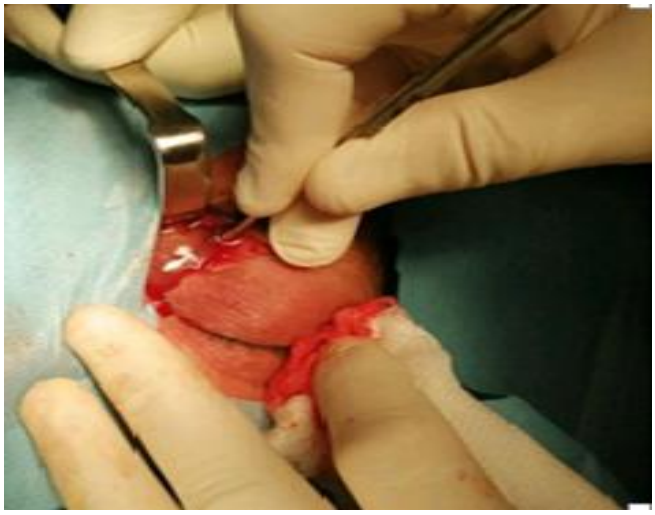

Figure 5. The periosteum is sharpy opened with a 11 blade

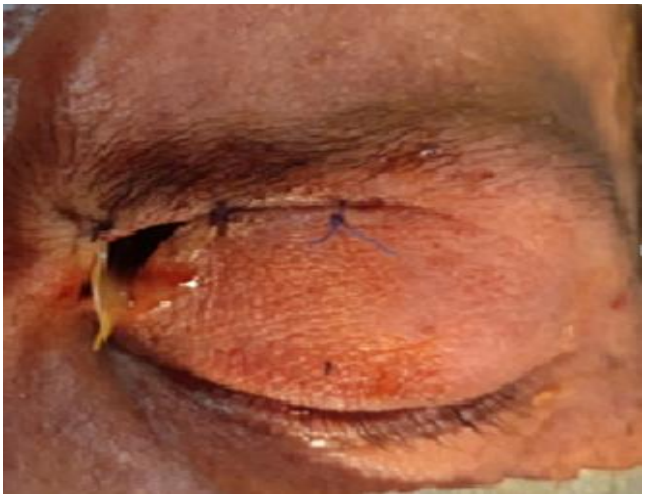

Figure 6. A small Delbet drain is placed and the wound is closed in layers

Clinical improvement was noted at day 7 with disappearance of all acute signs of infection. The Delbet drain has been removed. **(Figure 7)**

Figure 7. Evolution 7 days after surgery

Discussion:

Orbital cellulitis or abscess formation is a severe infection that can cause important complications such as blindness, cavernous sinus thrombosis, meningitis, subdural empyema, and brain abscess [5], it is a serious condition that should be suspected due to rapid contiguous spread of the infection[6]. The orbital abscess requires timely and effective treatment because of its morbidity [2]. The disease is believed to be most prevalent between the ages of 11 and 20[7].

The most common etiologic agent of orbital abscess in children is *Haemophilus influenza*. Moreover, *Staphilococcus aureus*, *Streptococcus pyogenes*, *Streptococcus pneumoniae* and anaerobes are the most frequent in teenagers and adults, and may vary according to the cause of the infection[8].

Orbital infections can be characterized as preseptal (periorbital) or postseptal (orbital) depending on its position relative to the orbital septum[9]. Acute sinusitis of the ethmoid and maxillary complex is the most frequent cause of a subperiosteal abscess; it can have odontogenic origin[6]. Bilateral pansinusitis is the most common cause among children[10].

The exact localization of the infection is sometimes difficult to recognize due to hampered clinical examination[6]. Examination should include the oral cavity as dental infections may be overlooked[6] Clinically it is characterized by periorbital pain, edema, exophthalmos, intense conjunctival hyperemia associated with chemosis, and limitation (restriction or decrease) of ocular movements[8,3]. A true orbital abscess can lead to blindness, cavernous sinus thrombosis, meningitis, subdural empyema, brain abscess, and death[4].

Contrast enhanced computed tomography (CT) is a crucial part of the diagnosis of orbital infections [6]. It is considered as the method of choice for diagnosis and localization of the abscess. However, some studies have shown that orbital computed tomography is not able to differentiate a subperiosteal abscess from an inflammatory

abscess of the medial orbit, which makes ultrasonography very useful in such cases.

The optimal management of subperiosteal abscess is still controversial; some providers favor immediate surgical drainage, and others recommend initial medical treatment with surgery as a last resort. Nevertheless, lack of treatment may lead to serious sequelae[6].

Some studies have shown that the possibility of optic nerve ischemia due to vascular compression with consequent amaurosis leads to the need for urgent surgical decompression. The purposes of the surgery of orbital abscess are to reduce the pressure on the orbit, drainage of pus, and obtain pus for culture[3].

In a previous study, the evaluated probability of surgery among children was 6% when there was no proptosis, and 92% for 2 mm of proptosis [10]. The timing of surgical drainage determines the appearance and level of visual reduction[6].

Recently, endoscopic surgery and ultrasound-guided FNA have been adopted for treatment of upper quadrant orbital abscess[3]. Furthermore, a literature review found that the chance of complete visual recovery is higher when drainage is performed within 48h[11].

Reportedly, 15% to 30% of subperiosteal abscess patients develop various visual sequelae despite antibiotics and surgical treatment[12]. After surgery most of the patient are discharged home from the hospital with a prescription to take a combination of antibiotics[10].

Conclusion:

Orbital infections require a thorough clinical evaluation, including the oral cavity as dental infections may be overlooked. Radiology plays a major role in evaluating the disease. A prompt and adequate treatment is crucial in preventing further spreading of the infections, surgical drainage is the mainstay of the treatment.

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