
Orbital abscess from an odontogenic infection

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An orbital abscess is a rare but serious complication of an odontogenic infection, which can lead to loss of vision or worse. This paper presents a case of orbital abscess secondary to an infection from the upper molar teeth, which extended to the retrobulbar and posterosuperior region of the orbit, close to the superior orbital fissure. The infection spreaded to the pterygopalatine and infratemporal fossa and then to the orbit via the inferior orbital fissure. This paper reviews the clinical presentation, differential diagnosis, route of spread, value of serial CT scanning, treatment and possible complications. (**Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2007;103:e1-e6**)

The extension of an odontogenic infection to the orbital space is relatively rare but can result in significant morbidity and mortality. The cardinal signs of an orbital infection are impairment of visual acuity, proptosis, pain, and limited ocular motility. Abscesses that extend to the posterior orbital space can even be life threatening, because the infection can spread through the optic canal and ophthalmic veins to the meninges and the brain.¹⁻³

Seventy to 80% of cases with orbital infections develop as a complication of an infection of the paranasal sinuses, with ethmoidal sinusitis being the most common source of an orbital infection in children. The remaining 30% occur as a result of spread from the eyelids, tonsils, intracranial areas, and the middle ear and odontogenic structures, either directly or through the lymphatic and vascular systems.²⁻⁸

Chandler et al.⁹ classified orbital infections into 5 groups according to their anatomic locations. This classification is useful in determining the clinical presentation, differential diagnosis, treatment, and prognosis.

Orbital infections are more clearly defined in relation to the orbital septum, which is the anterior extension of

the periosteum of the orbit. Inflammation anterior to the orbital septum or preseptal cellulitis is common in young children and shows lid edema in the absence of orbital signs. Inflammation behind the orbital septum or postseptal cellulitis can be divided anatomically into extraconal and intraconal disease by the extraocular muscles.^{3,10,11}

This paper reports a case of an intraconal orbital abscess resulting from the spread of an acute odontogenic abscess.

CASE REPORT

A 31-year-old male visited the emergency department at Inha University Hospital complaining of right midfacial pain, trismus, drooping of the right upper eyelid, and swelling in the right temporal area with a 1-week duration. Ten days before presentation, the patient had visited a medical practitioner with the chief complaints of temporal pain and a limitation in mouth movement. The patient was injected with steroids into the right temporomandibular joint under the misdiagnosis of a temporomandibular disorder. The signs and symptoms became aggravated after the injection. The patient had previously been in good health. His prior medical history was otherwise unremarkable, with no known drug allergies or current use of medications.

A physical examination revealed a moderately distressed patient with severe pain on the right side of his face, and erythematous edema and drooping of the right upper eyelid. There was right temporal swelling, as well as proptosis and diplopia (Fig. 1, A).

The visual acuity of the right eye was 8/20. The intraoral examination disclosed a trismus of 1cm and mobile maxillary right second and third molars. The panoramic radiograph (Fig. 1, B) and facial computed tomography (CT) scans showed periapical radiolucency of the right maxillary second and third molars, a marked right infratemporal abscess, proptosis of the right eye, and right orbital cellulitis inside the extraocular muscle conus (Fig. 2, A, B).

The patient was diagnosed with orbital cellulitis and an acute infratemporal abscess resulting from a periapical abscess of the upper right second and third molars. The working

This work was supported by Inha University Research Grant.

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Received for publication Mar 15, 2006; returned for revision Jun 03, 2006; accepted for publication Jul 10, 2006.

1079-2104/\$ - see front matter

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doi:10.1016/j.tripleo.2006.07.002



Fig. 1. **A**, Facial photograph shows drooping of right upper eyelid, right temporal and periorbital swelling, and proptosis of the right eyeball. **B**, Panoramic radiograph shows periapical radiolucency of right maxillary second and third molar teeth.

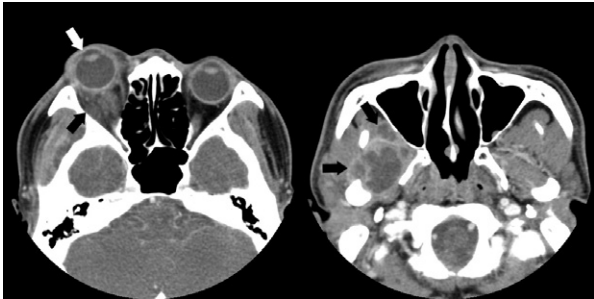


Fig. 2. Axial computed tomography (CT) scans of the paranasal sinuses. **A**, Proptosis and extensive cellulitis with abscess formation in the right retrobulbar area. **B**, Large abscess lesion with a multiseptated low attenuation of the right infratemporal fossa.

diagnosis was expanded to include the identified orbital abscess. The patient was admitted and placed on flomoxef (oxacephem, 2 g/day), netilmicin (an aminoglycoside, 300 mg/day), and metronidazole (1500 mg/day), parenterally.

On the following day, collected pus was obtained by needle aspiration for a bacterial culture and antibiotic sensitivity test. The upper right second and third molars were removed, and an incision and drainage were carried out in the temporal area. After surgical procedure, the temperature of the patient was 41.6°C, and the patient had an unstable and confused mental state. Diazepam and ketoprofen were added to the regimen, and cold was applied to both axillae. On the third day of admission, the patient had a temperature of 38.3°C and became afebrile on the fourth day of hospitalization.

On the ninth hospital day, the patient complained of blurred vision without other severe signs and symptoms. A second orbital CT scan taken on the 11th hospital day revealed the conversion of an intraconal cellulitis into an abscess (Fig. 3, A). The CT scan also showed that the multiple infratemporal abscesses had markedly improved (Fig. 3, B). With continuous parenteral antibiotic treatment, the signs and symptoms such as facial swelling and pain, fever, blurring vision, diplopia, and the limitation of mouth movement had improved.

A third CT scan taken on the 35th day of hospitalization

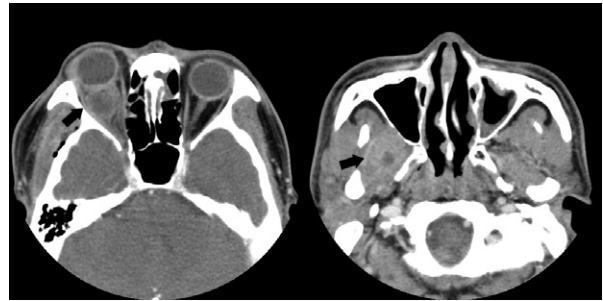


Fig. 3. Axial CT scans of the paranasal sinuses. **A**, Orbital cellulitis progressed to abscess cavity formation in the right intraconal space. **B**, Low attenuated fluid collection of the right infratemporal area was decreased.

revealed that the right intraconal abscess had been localized and reduced in size, and the infratemporal abscess was almost resolved (Fig. 4). The blood culture was negative and the *Streptococcus viridans* group grew from the pus. The patient was voluntarily discharged with improved signs and symptoms and visual acuity of 20/20.

One month later, the patient was readmitted complaining of recurrent orbital swelling, ptosis of the right upper eyelid, a fully dilated pupil, a decreased visual acuity of 2/20, and blurred vision. A fourth orbital CT and magnetic resonance imaging (MRI) taken on the day the patient was readmitted disclosed 2 lobulated and connected pseudo-tumorlike abscesses on the retrobulbar and superolateral region of the right orbit, as well as severe retinal indentation (Fig. 5).

After consultation with an infectious disease specialist, the regimen of the patient was changed from flomoxef and netilmicin to cefotiam (second generation cephalosporin, 2 g/day) and ceftriaxone (third generation cephalosporin, 2 g/day) from the sixth day of the second admission. On the 12th day of readmission, the intraocular pressure of the right eye increased to 27 mm Hg from 14 mm Hg. On the 13th day, a draining fistula developed spontaneously and was located on the superolateral aspect of fornical conjunctiva. On the next day, a Silastic drain was inserted through the conjunctival fistula under general anesthesia. On the 19th day, the intraocular pressure returned to normal (13 mm Hg). Coagulase-negative staphylococcus grew from the conjunctival pus.

A fifth orbital MRI taken on the 21st day revealed that the abscess cavity had disappeared and become fibrous, and the retinal indentation was markedly relieved (Fig. 6). A sixth orbital CT scan taken on the 48th day showed the almost complete disappearance of the abscess and recovery of the retinal indentation (Fig. 7). The patient was discharged on the 76th hospital day, with the removal of the Silastic drain on the 54th day. At the time of discharge, his visual acuity (3/20) had not recovered but the diplopia and blurred vision were almost resolved.

DISCUSSION

The "closed-box" anatomy of the orbit and surrounding structures predisposes these tissues to serious se-

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