

# Orbital Cellulitis as a Sole Symptom of Odontogenic Infection

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## ABSTRACT

**A case of periapical infection resulting in unilateral maxillary sinusitis and cellulitis of the ipsilateral lower eyelid is presented. The sole symptom was right orbital swelling. The possible pathway for the spread of this type of infection predisposing factors and possible complications are reviewed. The value of radiographic examination and antibiotic therapy are also discussed.**

**Keywords: odontogenic infection, orbital cellulitis, radiograph, antibiotics, endodontics**

## INTRODUCTION

Orbital and periorbital cellulitis are uncommon conditions which develop as a complication of infection of the paranasal sinuses, trauma to the eyelids or infection of the external ocular region. Infection of the paranasal sinuses usually happen at the ethmoidal and frontal sinuses, and occasionally the maxillary sinus. Maxillary sinusitis could result from dental infection<sup>(1)</sup> and the percentage varies considerably between 4.6% and 47.0%<sup>(2)</sup>. The dental origin may be periapical infection of the maxillary tooth/teeth or as a complication of dental extraction<sup>(3)</sup>. The manifestation of the spread of dental infection to the maxillary sinus has been termed the endo-antral syndrome<sup>(4)</sup>.

Toothache may be the patient's only complaint<sup>(5)</sup>. In orbital cellulitis originating from the infection of the extraction socket, the time interval between dental extraction and development of orbital symptoms ranged from two hours to thirteen days<sup>(3)</sup>. Patient may present with fever, elevated leukocyte counts and radiographic evidence of acute ipsilateral paranasal sinus infection<sup>(3)</sup>. On rare occasions, the patient may also present with signs and symptoms of meningitis<sup>(3)</sup>. This paper presents a case where orbital cellulitis was the only symptom of odontogenic infection.

## CASE REPORT

A medically fit 51-year-old English lady was referred to the Department of Oral and Maxillofacial Surgery at the Queen Victoria Hospital for the management of a unilateral orbital swelling that had persisted for the past two days. The swelling was not tender though slightly reddish in colour (Fig 1). She had not experienced any trauma to the orbital region and she

claimed that her vision was fine. She did not feel any discomfort at the right orbital or infra-orbital region.

Clinical examination revealed a soft swelling on her right orbital region, most obvious at the lower eye lid. It was oedematous and slightly reddish in colour. It was not tender to palpation. Her visual acuity and eye movement were normal.

Intraoral examination revealed retained roots of the maxillary right first premolar and first molar. Gutta percha ends could be seen at the remaining coronal region of both teeth, indicating both teeth had undergone root canal treatment. Both teeth were slightly tender to percussion but no swelling could be palpated at the buccal sulcus or palatal region. An orthopantomogram (OPG) and a Walter's (occipito-mental) radiographic view were taken. Both radiographs showed opacity of the right maxillary sinus. The Walter's view also showed radiopacity at the right lower orbital rim indicating a soft tissue swelling over the region (Fig 2). The OPG showed an obvious periapical lesion on the maxillary right first premolar. The periodontal ligament of the maxillary right first molar was widened. The root canal treatment of both teeth showed inadequate working length (Fig 3).

A diagnosis of periapical infection originating from the inadequately treated root canals resulting in unilateral sinusitis and eventual orbital cellulitis was made. The patient was prescribed 250 mg amoxicillin with 125 mg clavulanic acid mg for five days. She was reviewed the following week and the orbital cellulitis was no longer present. The roots of the maxillary right first premolar and first molar were no longer tender to percussion. As she was having dental treatment with a dental student, she was advised to have her root canals retreated to remove the source of infection.

## DISCUSSION

Accurate diagnosis is important as it allows for prompt treatment to prevent further complications of orbital cellulitis. Complications of maxillary dental infection include maxillary sinusitis<sup>(4)</sup> and pansinusitis<sup>(5)</sup>. On rare occasions, this may eventually lead to orbital cellulitis. Complication of orbital cellulitis includes neurological or ophthalmological problems. Its sequelae includes severe loss of vision<sup>(3)</sup>, blindness with ptosis and extropia<sup>(3,6)</sup>, cavernous sinus thrombosis<sup>(7)</sup>, empyema and death<sup>(3)</sup>.

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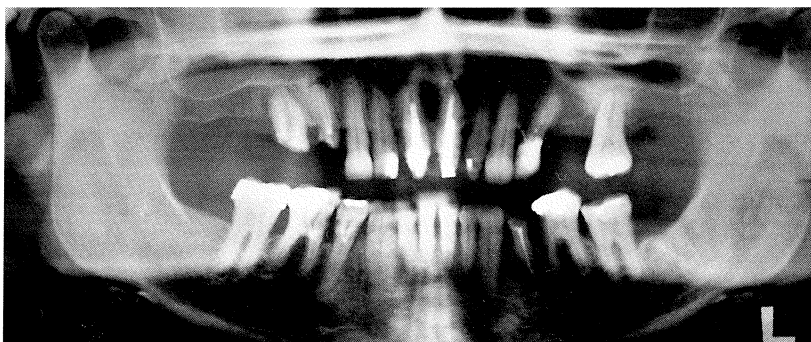
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**Fig 1** – Clinical photographs show right orbital cellulitis at frontal and lateral view.



**Fig 2** – Occipitomental view radiograph shows radiopacity of the right maxillary antrum.



**Fig 3** – Orthopantomogram (OPG) shows radiopacity of the right maxillary antrum. There is an obvious radiolucency at the apex of the maxillary right first premolar. The periodontal ligament space of the maxillary right first molar is widened. Both teeth have radiopaque filling in their root canals, indicating that both have been root-treated before. The filling of the root canals are short of their actual working lengths.

Antibiotic therapy alone was found to be effective in over 80% of patients with orbital and periorbital cellulitis in general<sup>(8)</sup>. However, no study has been done to show the effectiveness of antibiotic therapy alone in treating orbital and periorbital cellulitis due to dental infection. The source of infection must be treated i.e. the offending tooth root-treated or removed and the infected extraction socket debrided. As shown in this case, the orbital cellulitis was controlled with oral antibiotic. The patient however, needed further dental attention to remove the source of infection, namely the inadequately root-treated teeth.

Various pre-disposing factors had been identified in patients with orbital cellulitis. This includes nephrotic syndrome with chronic antral inflammation, pregnancy with upper respiratory tract infection and heroin addiction<sup>(3)</sup>. The patient reported here however, was medically fit and thus had good immunological response. This may explain why her maxillary sinusitis and orbital cellulitis were more confined and her being unaware of her dental problem until the orbital cellulitis was noticed.

Two sources of infection have been reported in the literature, namely infection in the maxillary tooth/teeth socket and on rare occasions, infection in the mandible. Various routes of infection have been discovered. This includes orbital extension of infection via the retromaxillary infra-temporal fossa<sup>(9)</sup>, the spread of infection via maxillary sinus and hence to the orbit through a defect in the orbital floor<sup>(10)</sup> and on rare occasions, the spread from infection from mandible via paranasal sinuses, deep facial circulation and orbital tissues<sup>(6)</sup>.

Radiograph is an important tool to confirm the diagnosis. As shown in this case, there was only slight tenderness of the retained roots when percussed. Radiographically, however, there was a radiopacity of the right maxillary sinus with a well defined periapical lesion of the first maxillary premolar. The periodontal ligament of the first maxillary molar was also widened. The root canals of both the teeth were also inadequately sealed. These findings confirmed the cause of the unilateral maxillary sinusitis and orbital cellulitis as of dental origin.

### CONCLUSION

Odontogenic infection may present as an orbital cellulitis. Medical practitioners should be thoroughly familiar with the manifestations of dental infection into the maxillary sinus and orbital area even though uncommon. Orbital cellulitis can lead to serious complications. One must suspect the maxillary tooth as a possible source of infection and prompt treatment with antibiotics is mandatory. Endodontics should be performed where indicated to remove the source of infection.

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