International Journal of Medical Research Professionals
P-ISSN: 2454-6356; E-ISSN: 2454-6364
DOI: 10.21276/ijmrp

IJMRP

Case Report .

Orbital Infection as Rare Sequelae to the Extension of Odontogenic Infection: A Case Report and Review of Literature

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ABSTRACT

Extension of dental abscess to distant areas of head & neck has been repeatedly reported in literature. Subsequent involvement of orbit is a rarity, though it may cause lasting damages resulting from insufficient therapy, like blindness, intracranial extensions or even death. Here we present a rare complication of odontogenic infection extending to orbit. A 32 years old male reported to us with a chief complaint of swelling and irritation in the left eye since 12 days. Patient gives a history of recurring dental pain in upper left back tooth region. His intraoral examination showed poor oral hygiene with tenderness on percussion on the left maxillary third molar. Investigations showed possible extension of infection from maxillary third molar to maxillary sinus and then to the orbit. Patient was treated with appropriate antibiotic coverage, removal of the offending tooth, institution of proper drainage and in consultation with the ophthalmologist. Orbital infection as sequelae of extension of odontogenic infection is rare, and can be managed successfully with appropriate diagnosis and timely medical & surgical intervention. Hence the need for extensive education of the practitioner becomes evident.

Keywords: Orbital Infection, Odontogenic Infection, Blindness, Intracranial Extensions.

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Article History:

Received: 29-03-2018, **Revised:** 22-04-2018, **Accepted:** 24-05-2018

Access this article online	
Website: www.ijmrp.com	Quick Response code
DOI: 10.21276/ijmrp.2018.4.3.019	

CASE REPORT

Orbital cellulitis is an uncommon condition that previously was associated with severe complications but such complications are rare now in the modern era of relatively early access to health care facilities.[1-4]

It can derive from many causes such as upper respiratory tract infections, sinusitis, dental abscess, trauma, closed fractures, peri-ocular surgery, panophthalmitis, septicemia and immunosuppression.[5,6] Chandler et al.[7] have classified it into 5 categories and emphasized the possibility of fatal outcome due to extension of the abscess to cavernous sinus in the form of thrombosis and intracranial spread. The orbital septum is the only barrier impeding the spread of infection from the eyelid into the orbit and the prognosis worsens if orbital septum is breached, so it is important to distinguish pre-septal and post-septal cellulitis but it is difficult to accomplish clinically. Hence, imaging is required for the confirmation of the diagnosis. Computed Tomography is the imaging modality of choice. The intracranial spread may be life threatening if left untreated and hence, prompt antibiotic treatment must be started along with surgical exploration. If the infection is odontogenic in origin, then it must be treated by removal of the involved teeth to allow for complete eradication and to prevent recurrence.

In this case report we present a rare complication of an odontogenic infection extending to the orbit.

CASE REPORT

A 32 years old male reported to the Department of Oral & Maxillofacial Surgery, GDC, Amritsar, with a chief complaint of painful swelling and irritation in the left eye region since 8 days. Patient gave history of pain in the left maxillary posterior tooth region 2 months back for which he took medications and the pain got relieved. Patient again experienced tooth-ache 15 days back in the same region and after 2 days noticed a swelling in the left cheek region which subsequently led to orbital swelling. Patient was prescribed medications and CT face (without intravenous contrast) by a private practitioner. Patient also gave a history of cigarette smoking and cannabis (charas) abuse since past 8 years. No other significant medical history was reported.

A physical examination revealed a moderately distressed patient with painful left periorbital swelling and pus discharge. Mild proptosis and severe chemosis of left eye was evident clinically. There was mild restriction of left eyeball movement on downward gaze. Intraoral examination revealed poor oral hygiene with proximal caries w.r.t. left maxillary 3rd molar and the tooth was tender on percussion. CT scan showed radio-opacification of left maxillary and ethmoid sinuses with mild proptosis and diffuse mucosal thickeningin the left sided ethmoids sinuses and thinning of ethmoid septae. Post-septal spread was also evident on radiographic examination. The diagnosis was established as a peri-apical infection associated with left maxillary 3rd molar, secondarily involving the maxillary & ethmoid sinuses with extension into the orbit.

Figure 1: Frontal view

Figure 2: Lateral view

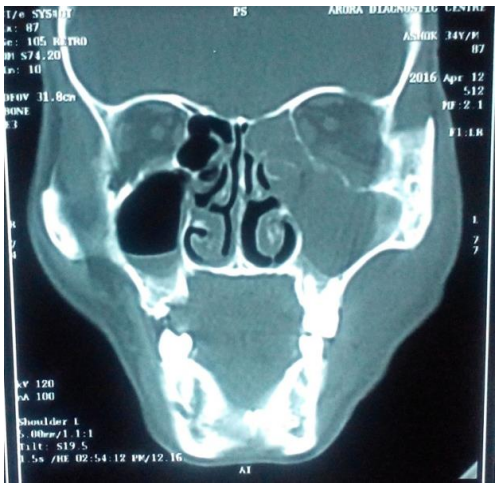

Figure 3: CT scan (Frontal section)

Figure 4: CT scan (Axial section)

Figure 5: Caldwell luc approach for drainage

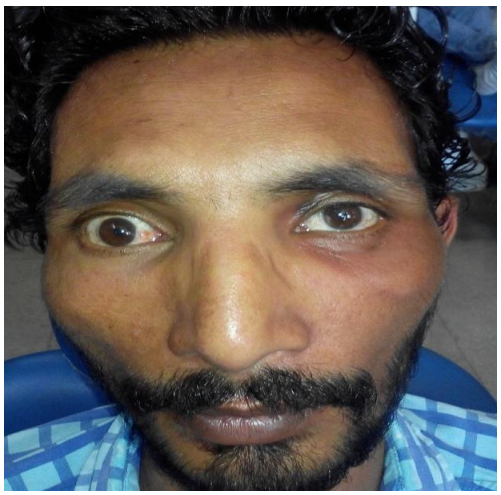

Figure 6: Follow up with complete resolution

Antibiotic regimen of inj. Amoxycillin+Clavulanic acid (1.2 g) TDS and inf. Metronidazole 500mg TDS was started along with Moxifloxacin 0.5% eye drops and tab. Ketorolac 10mg BD. Extraction of maxillary left third molar was done along with intra-oral drainage. The maxillary sinus was explored through a Caldwell Luc approach and pus was drained through the opening by thorough irrigation with normal saline. Parentral antibiotics were continued for 2 days post-operatively and then were given orally for 5 days. Patient was discharged 2 days post-operatively and was kept on regular follow-up.

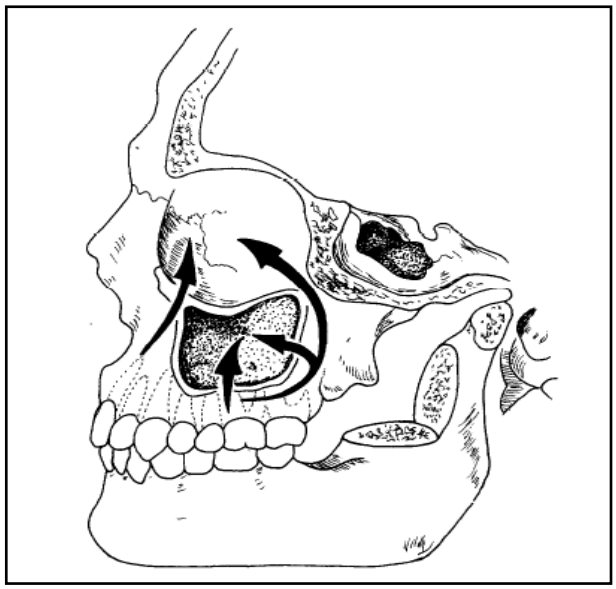

Figure 7: Diagrammatic representation of the path of spread of odontogenic infection to the orbit

DISCUSSION

Odontogenic causes of orbital inflammation are rare. Gans et al.[8] in a series of 190 patients with orbital inflammation have found that only 2% had an odontogenic source as the cause of the orbital inflammation. Odontogenic infections can gain entrance into the orbit through several routes (Figure 7). The buccal cortical plate of the alveolar process overlying the maxillary teeth is very thin and hence, most of the abscesses penetrate buccally.[9] Infection from the maxillary molars may penetrate the buccal cortical plate above the origin of the buccinator muscle and spread to the soft tissues of the cheek.[10,11] Orbital involvement may then ensue, either by direct spread through the local tissue planes or by an ascending facial thrombophlebitis. This ascension of a facial thrombophlebitis to the orbit is facilitated by the absence of valves in the ophthalmic veins, resulting in an extensive two-way communication between the facial and orbital venous networks. Both the ophthalmic veins also have communications with cavernous sinus, superior ophthalmic vein through the angular vein and the inferior ophthalmic vein through the pterygoid venous plexus. Thus, dental infection may propagate through the orbit and can give rise to cavernous sinus thrombosis.[12] Loss of vision may be other tragic sequelae.

Infections of maxillary molars may also spread posteriorly into the pterygopalatine and infratemporal fossae to reach the orbit via the inferior orbital fissure, or perforate the posterior maxillary wall to enter the maxillary sinus.[13] The apices of maxillary molars and premolars are in close proximity to the floor of the maxillary sinus and hence, infection of these teeth may produce maxillary sinusitis which may then involve the orbit and this is the most likely pathway of spread in our case.

The diagnosis of orbital cellulitis and its sequelae is mainly clinical although radiographs may be of diagnostic aid.[11] The most common organisms isolated in case of orbital abscess include *Streptococcus viridans, Streptococcus pneumonia, Streptococcus milleri, Streptococcus pyogens, Staphylococcus aureus* and *Haemophilus influenza*.[14] The treatment of orbital cellulitis is based on the severity and extent of spread of infection. Although conservative medical line of treatment is preferred first, a complication rate of 20 % and loss of vision in 14–33 % has been observed.[15] When an orbital infection is suspected, early aggressive broad-spectrum antibiotic therapy should be initiated and early drainage is a must for resolution of the infection. The usual approach to orbital abscess is by way of a skin incision but in our case it was draining into the maxillary sinus and hence, we could drain it through an opening made surgically into the maxillary sinus via an intraoral approach. So, an external skin incision was avoided.

It is imperative to understand the close anatomical relationship of the orbit and the adjacent structures to establish the early diagnosis and start vigorous treatment of this severe progressive and dangerous condition that can originate from dental infections to prevent the unfortunate complications described.

CONCLUSION

Orbital cellulitis occurring secondary to odontogenic cause, however uncommon, is not unknown and with the advent of antibiotics, the incidence has become even rarer. Infectious process that involves the eyes must be diagnosed and treated expeditiously because such process may fulminate in the deep orbit that lacks lymphatic drainage. Antibiotics alone may not be sufficient to prevent a fulminating infection that would render the eye functionless and a multidisciplinary approach is necessary to successfully manage a potentially serious ophthalmic infection.

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Source of Support: Nil. **Conflict of Interest:** None Declared.

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Cite this article as: Jeevan Lata, Akshay Thakur, Rajesh Prasad, Muni Madhav Sharma. Orbital Infection as Rare Sequelae to the Extension of Odontogenic Infection: A Case Report and Review of Literature. Int J Med Res Prof. 2018 May; 4(3):101-04.
DOI:10.21276/ijmrp.2018.4.3.019