ORBITAL ABSCESSE FOLLOWING A CLOSED FACIAL INJURY IN A YOUNG ADULT

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ABSTRACT

Background: Orbital abscess formation is one of the uncommon complications that occur following facial trauma. We report a rare presentation of orbital abscess in a young adult with post closed facial fracture.

Materials and Methods: a case report

Result: A 19-year old man who sustained head injury and facial bones fractures without any external adnexal wounds from a road traffic accident. He developed left periorbital haematoma and decrease vision after 3 days of trauma. He was suspected to have left optic neuropathy and empirically treated with corticosteroids. However, his left vision deteriorated and developed progressive proptosis within 3 days. Serial CT scan showed new formation of left subperiosteal and intraconal abscess. Endoscopic orbital decompression and drainage of the abscess was performed. Post operatively, his vision and the proptosis improved. Orbital abscess post closed facial fracture is an unusual complication.

Conclusion: High index of suspicion is necessary to diagnose this unusual presentation. Prompt treatment is essential to save the vision.

Keywords: Orbital abscess, optic neuropathy, facial trauma, orbital decompression
1.0 Introduction

Intraocular complications occur in 29.4% of patients with orbital fracture. Orbital abscess post facial fracture is one of the uncommon complication. It occurs in less than one percent of orbital fracture cases. It could be due to direct trauma, spread from adjacent structures or hematogenous in origin, and usually preceded by orbital cellulitis. Sinusitis and trauma are the main causes for orbital cellulitis, which represent 39.4% and 19.7% of the cause respectively. Majority of the patient with subperiosteal abscess had their sinuses involved, either maxillary, ethmoid or frontal sinuses. We report a case of orbital abscess in a young adult who sustained closed facial fracture.

2.0 Materials and Methods

A case report

3.0 Result

A 19-year old young man, alleged involved in a road traffic accident and sustained left periorbital haematoma, painless reduced vision and eye redness. He also suffered from traumatic brain injury and treated conservatively by neurosurgical team.

On ocular examination, best corrected visual acuity (BCVA) was 6/6 on right eye and 6/24 on left eye. Pupils sizes were equal bilaterally but there was relative afferent pupillary defect (RAPD) in the left eye. The light brightness contrast and red saturation was also reduced to 60 percent with colour vision affected. There was left periorbital haematoma with injected conjunctiva. No hyphema or anterior chamber cell were seen. Posterior segment examination was unremarkable. The intraocular pressures were normal. The right eye was essentially normal. No evidence of penetrating wound on the face except small superficial cut over the nasal bridge which was not communicating with the orbital fossa.

CT-scan showed medial and inferior orbital wall fractures with no muscle entrapment or foreign body penetration. In view of these, he was diagnosed as left traumatic optic neuropathy. He was treated with intravenous methylprednisolone 250mg qid for 3 days. Inspite of the treatment, his condition worsened. He started to developed left eye pain, reduced vison, proptosis, restriction of extraocular muscle and chemotic conjunctival in absence of fever [Fig. 1]. There was no leucocytosis and other septic work-out was unremarkable. A repeated CT scan showed left subperiosteal and intraconal abscess formation, with evidence of left maxillary and ethmoidal sinusitis [Fig. 2].
He was treated with intravenous ceftriaxone and moxifloxacin eyedrop empirically. He subsequently underwent endoscopic orbital decompression and drainage of the abscess by otorhinolaryngology team. *Gemella morbillorum* was isolated from the culture and was sensitive to the prescribed antibiotic. His vision improved to 6/6 with no restricted extraocular movement and the proptosis regressed few days after the surgery [Fig. 3].
4.0 Discussion

Orbital abscess is one of the uncommon complication to occur following closed facial trauma. It could be secondary to orbital injury, foreign body penetration, spread from nasal sinuses through the breached orbital wall or hematogenous in origin.

The average interval between the trauma and formation of orbital infection is between 5 days to 6 weeks\(^3\). In our cases it occurred early and uniquely without showing any general signs of infection in form of fever or leucocytosis, compared to other reported cases\(^2,3,6,7\) (Table 1).
### Table 1. Reported cases of post traumatic orbital abscess

<table>
<thead>
<tr>
<th>Journal (year)</th>
<th>Age (years)</th>
<th>Onset (day)</th>
<th>Fracture</th>
<th>Eye symptoms</th>
<th>Fever</th>
<th>Leucocytosis (x10^3)</th>
<th>Treatment</th>
<th>Surgery</th>
<th>Microbes</th>
<th>VA Pre</th>
<th>VA Post</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dhariwal et al. (2003)</td>
<td>21</td>
<td>2</td>
<td>Closed</td>
<td>Periorbital swelling, Diplopia, EOM restriction</td>
<td>Yes</td>
<td>38°C Yes 16.2</td>
<td>Co-amoxiclov Yes</td>
<td>Gram positive cocci</td>
<td>NA NA</td>
<td>6/12 6/5</td>
<td></td>
</tr>
<tr>
<td></td>
<td>24</td>
<td>3</td>
<td>Open</td>
<td>Proptosis, ophthalmoplegia</td>
<td>NA</td>
<td>NA No</td>
<td>Co-amoxiclov Yes</td>
<td>NA</td>
<td>CF 6/9</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wong &amp; Nordin (2016)</td>
<td>21</td>
<td>30</td>
<td>Open</td>
<td>Proptosis, EOM restriction, Chemosis IOP 32mmHg</td>
<td>Yes</td>
<td>NA</td>
<td>Cephalosporin Metronidazole Yes</td>
<td>No organism</td>
<td>NA 6/7.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neto et al. (2015)</td>
<td>11</td>
<td>4</td>
<td>Closed</td>
<td>Proptosis, Ptois, Ophthalmoplegia, Chemosis</td>
<td>NA</td>
<td>Yes</td>
<td>Ampicillin Sulbactam Clindamycin Yes</td>
<td>Streptococcus sp. Staphylococcus sp.</td>
<td>NA 6/6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ben Simon et al. (2005)</td>
<td>4.5</td>
<td>5</td>
<td>Closed</td>
<td>Periorbital swelling</td>
<td>Yes</td>
<td>37.9°C NA</td>
<td>Ceftriaxone, Vancomycin, Prednisolone Yes</td>
<td>No organism</td>
<td>CF Normal</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>31</td>
<td>2</td>
<td>NA</td>
<td>Symptoms of orbital cellulitis</td>
<td>NA</td>
<td>NA</td>
<td>Cefuroxime Metronidazole Yes</td>
<td>Mixed anaerobic</td>
<td>Normal</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Our case</strong></td>
<td>19</td>
<td>3</td>
<td>Closed</td>
<td>Proptosis, EOM restriction, Chemosis</td>
<td>No</td>
<td>No</td>
<td>Ceftriaxone Moxifloxacin (eyedrop) Yes</td>
<td>Gemella morbillorum</td>
<td>6/36 6/6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**CF** = Counting finger; **EOM** = Extraocular movement; **IOP** = Intraocular pressure; **VA** = Visual acuity
Most common organism isolated from orbital abscess was Staphylococcus species such as *S.aureus* and *S.epidermidis*, anaerobes species and *Streptococcus pneumoniae*. *Gemella morbillorum* was found only in 1.3% of subperiosteal abscess cultures in various studies. It is a gram positive, facultative anaerobe, catalase negative, non motile and non spore bacteria. It is a commensal organism that can be found in oropharynx, gastrointestinal and female genital tracts. It has been reported to cause sinusitis, dental abscess, brain abscess, Lugwig’s angina and soft tissue infection. In our case, the presence of maxillary and ethmoidal sinusitis could explain the spread of this organism into the orbit through the fractured orbital wall.

In treating orbital cellulitis and subperiosteal abscess, Garcia and Harris recommended that for a “modestly” sized abscess, with no visual compromise, without any intracranial or frontal sinus involvement, it could be treated conservatively with medical treatment. Once there is deterioration of vision, drainage of abscess is necessary. Various approaches has been described for draining of the abscess, either externally or endoscopically.

Other than surgical drainage and antibiotics, sinusitis can be managed conservatively with nasal irrigation, decongestants, nasal corticosteroid and systemic corticosteroid. Hence, the use of intravenous corticosteroid in our case as the initial treatment for traumatic optic neuropathy should not adversely affect the clinical outcomes. In fact, it may be beneficial as several studies mentioned its usage for treating orbital cellulitis with subperiosteal abscess.

### 5.0 Conclusion and recommendation

Orbital abscess post closed facial fracture is an unusual complication. High index of suspicion is necessary to diagnose this unusual presentation. Involvement of a multidisciplinary approach is of utmost importance to institute prompt treatment to evert a blinding complication.

### Acknowledgement

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### Declaration

The authors declare no conflict of interests. The authors alone are responsible for the content and writing of the paper.
Authors’ contribution

Author 1: Wrote the manuscript with consultation from author 2, 3 and 5
Author 4: Provided critical feedback
Author 1: Wrote the manuscript, provided critical feedback and supervised the whole process.

References


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