



## Orbital Subperiosteal Abscess in Paediatric a Case Report

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### Authors' contributions

This work was carried out in collaboration between both authors. Author MSS designed the study and wrote the first draft of the manuscript. Author IPT managed the analyses of the study and the literature searches. Both authors read and approved the final manuscript.

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Case Study

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### ABSTRACT

Orbital infections and their complications are mainly managed by ophthalmologists. Nevertheless, there are few cases which are better co-managed with otorhinolaryngologist (ORL) counterparts. Such example included the orbital subperiosteal abscess in which certain area of the orbit can be drained by a trained ORL surgeon. Infections in paediatric require prompt diagnosis and aggressive treatment to avoid complications. We reported a case of a rapidly progress right orbital cellulitis complicated with subperiosteal abscess involving a 5years old boy in a tertiary medical centre.

*Keywords: Nasoendoscopic; orbital infections; subperiosteal abscess; otorhinolaryngologist.*

### 1. INTRODUCTION

Origin of orbital cellulitis can be epicentrically orbital or a spreading infection from paranasal

sinuses [1]. Possible source of infections included the eyelids, conjunctiva, facial, lacrimal sac, haematogenous, trauma and rarely endophthalmitis [1,2]. Sinus infections are mainly

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ethmoidal, followed by maxillary and sphenoid [2,3]. It should be diagnosed early to prevent possible morbidity and mortality [2]. Chandler et al, had proposed a classification beginning from pre-septal cellulitis escalating to cavernous sinus thrombosis [4]. Empirical antibiotics are commonly given as the initial modality of treatment, though surgical approach should be considered early especially in case of anticipated failure medical treatment and rapid progression of disease [2].

## 2. CASE PRESENTATION

5-year-old boy with past history of acute glomerulonephritis presented to casualty with sudden painful and right eye swelling, associated with fever and upper respiratory tract infection for two days duration. No history of trauma nor insect bite elicited. His right eye was severely swollen noted upon examination with erythematous of the outer eyelids. The eye opening and extraocular movement was restricted due to pain and mild proptosis was noted. Nasoendoscopic examination showed normal mucosa with no evidence of obstruction. Systemically, the boy was in sepsis with fever, tachycardic and marked elevated white cell count

with neutrophilic predominance. He was admitted and treated with broad-spectrum intravenous antibiotic. However, his eye deteriorated rapidly noted on the following day, with worsening proptosis and the opening and extraocular movements were totally restricted with severe swelling and erythematous of the periorbital tissue. His vision assessment however, surprisingly still preserved.

CT PNS urgently done showed presence of heterogenous rim enhancing collection measuring 1.9x 0.5x 2.0cm suggestive of subperiosteal abscess collection along the medial wall of the right orbit with mucosal thickening of bilateral maxillary sinuses. The optic nerve and extraocular muscles were not affected. The parents were counselled and consented for endoscopic surgical drainage of the abscess. Emergency endoscopic transnasal orbital decompression and abscess drainage was performed under general anesthesia. Intraoperatively, as soon as the lamina papyracea was dissected opened, around 10mls of frank pus was drained immediately. Specimens were sent for microbiological and histopathological examinations.



**Fig. 1. Shows the ocular findings upon presentation**



**Fig. 2. Shows a section computed tomography of paranasal view in axial cut, subperiosteal abscess collection lateral to right lamina papyracea**



**Fig. 3. Shows endoscopic view of pus drainage after cutting open the lamina papyracea**

Post operatively showed significant improvement of the patient's condition as the periorbital swelling was markedly reduced and marked improvement of the eyelid opening and ocular movement. No visual deficit was noted and he was discharged home with 2 weeks duration of antibiotics. Subsequent clinic visit showed total improvement of the eye with no residual evidence of infection.

### **3. DISCUSSION**

The orbital sequelae of rhinosinusitis was estimated to be around 74-85% with orbital

subperiosteal abscess was reported as the commonest complication with prevalence between 12-17% [4,5,6]. Although commonly seen in paediatric age group, Reza et al reported that there was no statistically difference in between age and sex [2,3,5,6]. This infection is serious especially in paediatric due to thin lamina papyracea that separate the periorbital tissue and cerebral structures [2]. If not being properly managed, it could progress further leading to bizarre complications such as visual impairment, eye blindness, orbital abscess, cavernous sinus thrombosis, meningitis, cerebritis, subdural empyema, brain abscess or even death [2,6].

Thorough examination remains the hallmark of assessing the severity and progression of this infection with classical signs of proptosis, periorbital erythema, conjunctival chemosis, restricted extraocular movement, exposure keratopathy and corneal ulceration could be elicited [1,2,3,5,6]. Fundoscopic examination may show swollen optic nerve and impaired visual acuity [1,3]. Systemic signs of sepsis such as pyrexia, tachycardia, with high pain score are important to achieve holistic picture of the patient. Classical CT features of a convex low-density lesion with presence of air pockets and evidence of rim enhancing collection would suggest this infection [6]. In addition, it helps to assess the location and size of abscess, changes of the periorbital structures especially the orbital fat and muscles, and any anatomical abnormalities of the sinuses and nearby structures [6].

Till date, the management of orbital subperiosteal abscess remains controversial with no definitive guidelines [6]. Some surgeons might opt for initial trial of broad-spectrum intravenous antibiotics despite clear presence of abscess [6]. This is mainly for smaller size abscess with diameter less than 10mm and the duration allowed is until 48 hours of closed monitoring [3]. Should any evidence of large abscess of more than 10mm, worsening of vision or intracranial extension, surgery is promptly required [3]. Another school of thought believed that the presence of any abscess alone is an absolute indication for surgical drainage irrespective of size without any delay [2,6]. As for our setting, we opted for surgical drainage as soon as possible despite the duration of intravenous antibiotics given was still less than 48 hours, it had yielded a tremendous outcome post-operatively.

#### 4. CONCLUSION

Orbital subperiosteal abscess is an example of case that can be encountered during daily practice with special attention need to be given for paediatric cases. Multidisciplinary approach

especially between ophthalmologist, paediatrician and otorhinolaryngologist is beneficial in managing the patient. Nevertheless, having a thorough knowledge in depth regarding this is of essence to anticipate the progress, outcome and complications of this disease.

#### CONSENT AND ETHICAL APPROVAL

As per international standard or university standard guideline participant consent and ethical approval has been collected and preserved by the authors.

#### COMPETING INTERESTS

Authors have declared that no competing interests exist.

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