

Left subperiosteal abscess with contralateral preseptal cellulitis: A case report

Case Report

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ABSTRACT

Bilateral orbital complication secondary to acute sinusitis in paediatric age group are uncommon. Early endoscopic orbital decompression surgery provides good outcome and hence preventing more dreaded complications like cavernous sinus thrombosis leading to loss of vision. We report a case of left subperiosteal abscess with contralateral preseptal cellulitis in a 4-year-old Iban girl.

Key Words: Orbital decompression, paediatric, preseptal cellulitis, subperiosteal abscess

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INTRODUCTION

Bilateral orbital complication secondary to acute sinusitis in pediatric age group is an uncommon presentation. We aim to raise awareness about the prompt referral of such cases to multidisciplinary unit which includes mainly Otorhinolaryngology and Ophthalmology Department for a successful and favorable outcome. In addition, a combination of antibiotic and early surgical intervention is a standard goal in order to bring out a good outcome.

CASE REPORT:

A 4-year-old Iban girl with no co-morbidity, presented to a district hospital with 3 days history of fever, bilateral periorbital swelling which preceded by cough and rhinorrhea. Clinical examination revealed edematous, inflamed and tender bilateral periorbital region. There was restricted eye opening but the extraocular muscle movements were not limited. The visual acuity measured 20\20 in the right eye and 20\50 in the left eye with negative relative afferent pupillary defect. Total white cell count 35.7 x10³μL which was neutrophil predominance.

Eye swab culture and sensitivity (C and S) was taken and intravenous Ceftriaxone was commenced. However clinically patient did not improve even after 2 days of intravenous antibiotics but visual acuity did not worsen. Computer tomography scan was performed on the third day of admission and revealed medial extraconal subperiosteal abscess of the left orbit measuring 2.5cm (AP) x 1.0cm (W)x 2.0cm (CC), causing mid lateral displacement of

medial rectus muscle and mild proptosis with bilateral preseptal cellulitis (Left more than right). There was erosion of left lamina papyracea along with both anterior ethmoidal sinuses and maxillary sinuses showed extensive mucosal thickening and suggestive of sinusitis. (Fig 1 and Fig 2)

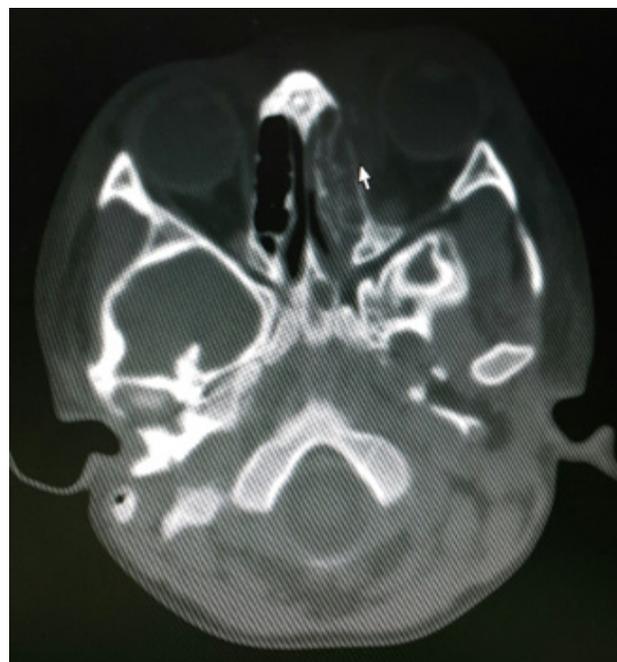


Fig. 1: Computer tomography showing left lamina papyracea subperiosteal abscess (associated with erosion of left lamina papyracea) extending into medial extraconal space of the left orbit causing mild lateral displacement of medial rectus muscle with borderline proptosis of left orbit.

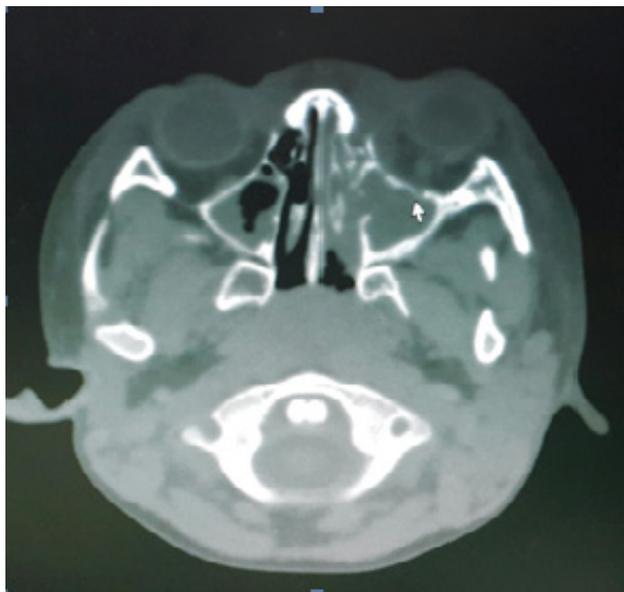


Fig. 2: Computer tomography showing left orbit medial extraconal subperiosteal abscess causing mid lateral displacement of medial rectus muscle. Opacity seen in left maxillary sinus possibly of pus collection.

The patient was later referred to Otorhinolaryngology Department and examination under anaesthesia along with orbital decompression was done. Intraoperatively noted nasal cavity was narrow. Uncinectomy and middle meatal antrostomy were performed. While widening the antrum, noted pus discharge from the left maxillary sinus and pus C and S was taken. Dissection of anterior ethmoidal air cells was performed followed by gently flaking off the lamina papyracea. A budge was visualised and pus was drained out from the small incision made at medial of orbit by using a sickle knife. However, there was only blood collection from the left anterior ethmoidal sinus. Mucosa over the medial wall of orbit was inflamed and on probing noted to have pus discharge which was subsequently drained.

Eye swab C and S which was taken preoperatively revealed no growth. Pus C and S and pus for acid fast bacilli intraoperative revealed no growth. Day one post operation, fever subsided, bilateral periorbital swelling and left eye proptosis reduced markedly. Intravenous antibiotic was converted to oral post operation day 2 and patient was discharged well post operation day 4. Upon follow up in Ophthalmology and Otorhinolaryngology clinic one week later, bilateral orbital cellulitis resolved completely.

DISCUSSION

Children with orbital complications are mostly secondary to acute rhinosinusitis. Paranasal sinuses have adjacent anatomical relation to the orbital cavity where infection can easily spread through the paper-thin lamina papyracea which forms the medial wall of the orbit and lateral wall for the ethmoidal labyrinth.

A congenital dishiscence of the lamina papyracea or valveless ophthalmic venous system could be the modes of transmission of infection from ethmoidal sinuses to the orbit.^[4] Chandler classified orbital involvement into preseptal cellulitis, orbital cellulitis, subperiosteal abscess (SPA), orbital abscess and cavernous sinus thrombosis in the early 1970's.

High intraorbital pressure as a result of inflammation in the post septal space and central retinal vessels occlusion or with damage to the optic nerve potentially leading to loss of vision. Blindness could happen in approximately 1% of patients with orbital cellulitis^[1]. Nageswaran *et al.* found that 98% of their patients with orbital cellulitis were affected by ethmoidal sinusitis and 71% by maxillary sinusitis, respectively. Bilateral pansinusitis is the most common presentation. It was estimated that the incidence of subperiosteal abscess in orbital infection is about 15 % in children.^[2]

In the pre-antibiotic era, 20% of patients with periorbital cellulitis were documented with permanent loss of vision and 17% died from central nervous system complications. Nowadays, despite antimicrobial and surgical management, 15% to 30% of patients with an SPA develop various visual sequelae.^[3] Overtime, the number of orbital complications has reduced, however, the orbital complications of acute rhinosinusitis are still dreaded.

It is compulsory for all children with suspected orbital cellulitis to proceed for a computer tomography scan. Howe and Jones recommended a computer tomography scan to be performed in patients where full evaluation of the eye is not possible because of gross edema, gross proptosis, ophthalmoplegia, deteriorating visual acuity or color vision or bilateral periorbital oedema^[1]. Nevertheless, even if preseptal cellulitis is presented, CT scan is recommended due to the rapid progression of the disease.^[2]

The orbital complications in paediatric rhinosinusitis are usually unilateral at presentation. However, in our patient, she is presented with left subperiosteal abscess with contralateral preseptal cellulitis which is an uncommon presentation. The hypothesis for cases with bilateral orbital complications secondary to rhinosinusitis was that the disease spreads from the orbit to the cavernous sinus through the ophthalmic veins and then to the contralateral eye through a pathway provided by the dura mater of the cavernous sinus that is contiguous with the periosteum of orbit. However, this involves spread of the infection intracranially. Direct spread of disease from the ethmoid sinuses to both orbits has not been proposed as a mechanism to explain bilateral orbital cellulitis.^[4]

The other hypothesis postulated are related to asymmetries in the anatomy of the lamina papyracea on the infected and non-infected sides. Dehiscences of the lamina papyracea, the so-called Zuckerkandl dehiscences, are distributed asymmetrically. Acquired dehiscences are also usually asymmetrical, since they are caused by trauma

that rarely affects both sides of the face equally. These asymmetries would favour the spread of disease to one orbit.^[4]

An acquired traumatic dehiscence is much more likely to be present in older children where this provides a pathway for the spread of disease in addition to congenital dehiscences and neurovascular foramina. The presence of multiple pathways for the spread of infection together with advanced disease may make bilateral complications of rhinosinusitis more probable in older children. However, the incidence of rhinosinusitis in older children is relatively low.^[4]

Rahbar *et al.* found that orbital subperiosteal abscess in children can be successfully and safely managed by a transnasal endoscopic approach in selected patients ^[2]. All patients with orbital cellulitis should be treated with intravenous antibiotics and to undergo endoscopic orbital decompression if there is abscess formation or visual impairment like our patient.

The potential for loss of vision and the devastating morbidity associated with an SPA immediate surgical drainage is recommended when there is ^[1] impairment of vision,^[2] worsening of the visual examination results (periorbital erythema or edema, proptosis, and restriction of gaze),^[3] any sign of systemic manifestation or complication,^[4] an inability to perform a reliable and serial ophthalmologic examination, ^[5] an immunocompromised patient, and^[6] a lack of response to an initial trial of appropriate intravenous antibiotics.^[3]

CONCLUSION:

Bilateral orbital complications of rhinosinusitis in pediatric age group is uncommon and they can

progress rapidly. Early commencement of antibiotics is recommended whereby delay in treatment may bring about fatal complication which is cavernous sinus thrombosis that results in loss of vision or mortality. Thus, a prompt decision to refer such cases from district hospital to a tertiary care is essential and multidisciplinary approach in managing these cases is mandatory in providing the best possible outcome.

CONFLICT OF INTEREST:

There are no conflict of interest.

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