



ENDOSCOPIC DRAINAGE OF MEDIAL SUBPERIOSTEAL ORBITAL ABSCESS IN A YOUNG CHILD – A CASE REPORT WITH REVIEW

¹*Pirabu Sakthivel, ²Bhinya Ram, ³Prem Sagar, ⁴Rishikesh Thakur and ⁵Rijendra Yogal

^{1,2,3,4,5}Department of Otorhinolaryngology & Head and Neck Surgery, All India Institute of Medical Sciences, New Delhi.

***Corresponding Author: Pirabu Sakthivel**

Department of Otorhinolaryngology & Head and Neck Surgery, All India Institute of Medical Sciences, New Delhi.

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ABSTRACT

Acute rhinosinusitis is the predominant cause of orbital infections in children. The incidence of subperiosteal orbital abscess [SPOA] is about 15% in children. The diagnosis of SPOA is based on clinical findings and radiological investigations. Despite antimicrobial and surgical management, 15% to 30% of patients with SPOA develop various visual sequelae. Hence prompt diagnosis and appropriate early intervention is of paramount importance. Treatment of SPOA remains controversial with no defined and established guidelines. It is necessary to take decisions on case by case basis. However numerous recent studies have documented the efficacy and safety of endoscopic drainage of SPOA especially in children. We report a case of medial SPOA managed early with transnasal endoscopic drainage with excellent post operative result.

KEYWORDS: Subperiosteal abscess, endoscopic drainage, complicated sinusitis.

INTRODUCTION

Acute rhinosinusitis is one of the common causes of orbital infections in children. The close anatomic relation of the orbit to the paranasal sinuses predisposes to the contiguous spread of infection through ophthalmic venous system which freely anastomoses with the facial, pterygoid and cranial venous system. Retrograde spread of infection can lead to various complications such as endophthalmitis, cavernous sinus thrombosis, meningitis, cerebritis, brain abscess or even death. Though orbital complications of sinusitis have decreased steadily in the current antibiotic era the prevalence of subperiosteal orbital abscess [SPOA] is approximately 12–17% of all orbital infections.^[1-3]

The diagnosis of SPOA is based on clinical findings and by Computerized tomography (CT) of the orbit and paranasal sinuses depicting the source and extent of the infection.^[1,4] About 15% to 30% of patients who have this complication will develop various visual sequelae, even with aggressive medical and surgical intervention.^[5]

The optimal management of SPOA is still debatable regarding the medical versus surgical treatment and the type of surgical approach in case of surgery. Some physicians favour immediate surgical drainage while others recommend initial medical treatment keeping surgery for non-responders prone to develop complications.^[1,6]

Case history

A 2year old female child presented to our hospital ophthalmology emergency with history of fever, right eye swelling and purulent nasal discharge for 3 days duration. The right eye swelling was rapidly increasing despite oral antibiotics which was prescribed by a local ophthalmologist. There was edematous lids with proptosis, chemosis and restriction of extraocular muscle movements in the right eye [Figure.1]. Visual acuity could not be checked accurately and pupillary reflexes were normal. A contrast enhanced CT scan of the sinuses was obtained which showed opacification of the right maxillary and ethmoid sinuses as well as a subperiosteal fluid collection with gas shadow consistent with acute maxillary and ethmoid sinusitis with a medial subperiostealorbital abscess [Figure. 2A, 2B]. The patient was taken in emergency and transnasal endoscopic abscess drainage was done. After anterior ethmoidectomy and removal of lamina papyracea pus from medial orbital wall was drained and sent for culture. Culture grew methicillin resistant *Staphylococcus aureus* resistant to amoxicillin clavulanate and sensitive to the vancomycin & clindamycin. I.V vancomycin was given for another 5 days. After a week the child was discharged in stable condition [Figure. 3] with oral clindamycin for 2 weeks.



Figure.1: Pre operative picture showing marked lid edema with proptosis.

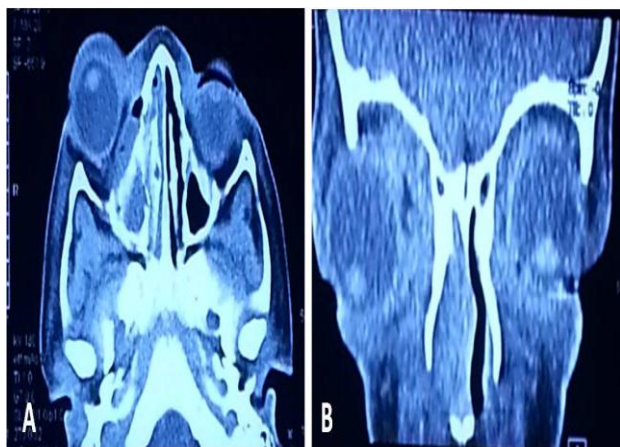


Figure.2: Axial (2A) and coronal 2(B) CT scans, soft tissue window with intravenous contrast, demonstrating right subperiosteal abscess with evidence of gas formation. Note ipsilateral ethmoid and maxillary sinus opacification.



Figure.3: Clinical picture on the sixth postoperative day.

DISCUSSION

SPOA is mostly seen in young children but can be present at all ages.^[1,4] Males are affected twice as frequently as females and it is found that teenage males

are at higher risk.^[1,7] Lamina papyracea being a thin structure acts as a poor barrier to the spread of the infection, consequently the most common site of SPOA is the medial wall of orbit and the most common cause being ethmoidal sinusitis, which may also coexist with maxillary and/or frontal sinusitis.^[7]

The clinical signs of a postseptal infection include chemosis, proptosis, restriction of extraocular muscle movements, and, if untreated, progressive visual loss, which may be temporary or permanent. The amount of information that can be obtained from an ophthalmologic examination varies from very limited in a febrile 2-year-old who has chemosis and proptosis, to detailed examination in a 14-year-old who has limited periorbital edema.^[5] Two pediatric studies of medial subperiosteal abscesses reported that complete clinical examinations were possible in 57% and 62% of their subjects.^[4,8]

Contrast enhanced CT scanning is the diagnostic imaging modality of choice in patients suspected to have orbital complications of sinusitis. CT scanning is fast, widely available, can be performed in children without the need for sedation and allows accurate assessment of both soft tissue and bony changes. Axial views better demonstrate the displacement of the medial rectus muscle and the abscess within the orbit, whereas coronal cuts are useful to delineate orbital and sinus anatomy. A medial SPOA is seen on CT scans as a rim-enhancing mass within the orbit, next to the lamina papyracea displacing the medial rectus laterally. A recent study by brown et al used lateral displacement of the medial rectus muscle of at least 2 mm as a diagnostic criterion for a subperiosteal abscess.^[8] In patients who have orbital complications of sinusitis, MRI should be performed if fever recurs after an appropriate initial response to the antibiotic; if there are changes in the patient's mental status; or when CT findings suggest the intracranial spread of disease.^[4]

The bacteria causing the orbital complications are similar with those of acute sinusitis, which are aerobic and anaerobic streptococci, staphylococci, haemophilus influenza and bacteroides.^[1,9,10] Liao et al reported that the incidence of MRSA-positive orbital and/or sinus cultures were approximately 6.5% of all of their cases.^[10] Methicillin-resistant *Staphylococcus aureus* (MRSA) is a rising concern as in our case. Vancomycin is the drug of choice for MRSA.^[1,10]

The optimal initial management of medial SPOA in children is still debatable. Some favour prompt drainage of the abscess, whereas others recommend a trial of medical management.^[4,8,11] Surgical drainage was reserved for patients with deterioration in visual acuity, appearance of an afferent pupillary defect, continuing fever after 36 hours, clinical deterioration after 48 hours or no improvement after 72 hours of medical treatment.^[4]

Endoscopic drainage of a medial SPOA is the surgical procedure of choice.^[4,6] The endoscopic approach offers

several advantages like unsurpassed and magnified visualization of the surgical field, visualization laterally and around corners into the orbit using angled endoscopes, allowing comprehensive treatment of the orbital abscess and the offending paranasal sinuses, obviating the need for facial incisions, shorter post operative stay and less postoperative edema.^[6,12]

The mini drainage by doing only anterior ethmoidectomy and opening the anterior portion of the lamina papyracea is sufficient to drain the abscess and less is traumatic for mucosa and has advantages in terms of bleeding.^[1,12,13] According to Froehlich et al endoscopic subperiosteal orbital abscess drainage does not require complete ethmoidectomy as was previously performed and can be limited to the opening of the bulla ethmoidalis and the lamina papyracea through the bulla ethmoidalis.^[12]

The main limitation of the endoscopic approach is related to the bleeding potential of the acutely inflamed mucosa, which may compromise visualization of the surgical field, especially if operating within the confines of a pediatric nose which may compromise the safety and completeness of the procedure. There are instances where, the surgeon should always be prepared to convert to an external approach if the need arises.^[6]

CONCLUSION

With the latest endoscopic technologies and equipments, the transnasal endoscopic drainage is a safe and effective surgical technique for medial SPOA allowing comprehensive treatment of the offending paranasal sinuses especially in children.

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