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Case Report

A rare case of neonatal bacterial sinusitis

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ABSTRACT

Acute bacterial maxillary sinusitis is uncommon occurrence in the pediatric age group. Complications from this condition are rarer in the neonatal period with less than 10 cases reported worldwide. The diagnosis and treatment of maxillary sinusitis and its complications poses challenges as there are no clear guidelines on conservative management versus early surgery. We present a rare case of acute maxillary sinusitis with orbital complications in a 13 day old neonate.

Keywords: Bacterial sinusitis, Neonatal sinusitis

INTRODUCTION

Acute bacterial sinusitis may be reported in about 5-10% of upper respiratory tract infection in the pediatric age group a small percentage of which go on to develop complications.[1,2] Complications of sinusitis in the neonatal age group is found to be even more rare with less than 10 cases of orbital complications reported in literature.[3] The most common causative organisms of acute sinusitis in this age group are *Streptococcus pneumoneae, Haemophilus influenza and Moroxella catarahellis*, however *Staphylococcus aureus* is found the most common organism responsible for complications of sinusitis.[3,4] The diagnosis of sinusitis and it complications can be challenging in neonates as its presentation may be subtle.[1] We present a case of a 13 days old child presenting with complications of acute sinusitis and a review of literature.

CASE REPORT

A 13 day old child, born at 38 weeks of gestation presented with history of discharge from the right nostril for 3 days (10 days after birth). The discharge was initially mucoid and but later became blood stained (following trauma as the mother tried cleaning with buds), and increased when the child was the in upright position. There was no history of fever, no history of bleeding from other sites. Birth history was uneventful and the child had received Vitamin K at birth.

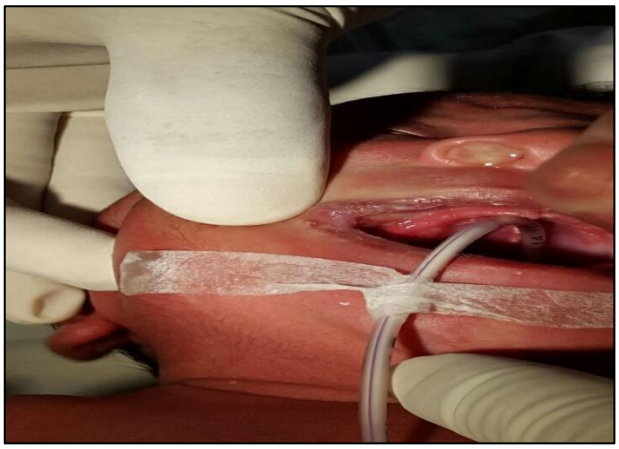

Figure 1: Mucopurulent discharge in the right nasal cavity.

On examination the child was afebrile with a respiratory rate of 60/min (30-60/min) and heart rate of 140 beats per minute (100-160 beats/min). There was no chest in-drawing or retractions. On examination of the nasal cavity there was blood stained mucoid discharge from the right nasal cavity (Figure 1). There was a diffuse swelling in the right malar region with no redness or local rise of temperature. Examination of the oral cavity revealed a bulge in the right gingiva-labial sulcus 0.5 cm from the midline with pus pointing.

Blood investigation showed haemoglobin 16.2 g/dl (10-18 g/dl), total count 15,650 (5000-19500/ µL), neutrophils 42 (25-60%), lymphocytes 53 (46-66%), metamyelocytes 2%. Serum C-reactive protein 9.6 (0.05-0.33 mg/dl).

Nasal discharge was sent for culture which subsequently showed a heavy growth of methicellin sensitive *Staphylococcus aureus* (MSSA). The child underwent a contrast enhanced CT scan of the nose and paranasal sinuses which revealed a soft tissue attenuation in the right maxillary sinus with evidence of erosion of the superior, inferior and medial wall of the right maxillary sinus (Figure 2).

Figure 2: Axial cut of contrast enhanced CT scan of nose and paranasal sinuses showing soft tissue attenuation in right maxillary sinus with bony destruction.

Superiorly the lesion was extending into the extraconal space of the orbit with loss of fat planes with the inferior rectus and inferior oblique muscles with heterogenous contrast enhancement. Inferiorly there was erosion of the roof of the hard palate and medially the lesion was seen to be extending into the nasal cavity. The lesion was also seen to extend into the infra-temporal fossa through a lateral wall defect. With the above findings a diagnosis of malignant lesion or an inflammatory pseudotumor was considered.

The child was started on Injection Ciprofloxacin which was subsequently changed to injection vancomycin based culture and sensitivity report. As the child did not respond to conservative management he underwent a diagnostic nasal endoscopy. The lateral wall of the nasal cavity was pushed medially with evidence of bony erosion of the lateral wall of nose in the region of the inferior meatus. A middle meatal antrostomy was done which revealed thick mucopurulent discharge and extensive granulation tissue in the right maxillary sinus. The pus was drained and granulation tissue was sent for biopsy. Histopathological examination showed granulation tissue composed of a dense infiltrate of neutrophils, lymphocytes, histiocytes and plasma cells with a few multinucleate giant cells. There was no fungal elements and periodic acid schiff (PAS) and gomori methenamine silver (GMS) stains showed no additional features. Hence a diagnosis of acute inflammation with a giant cell response was considered.

DISCUSSION

Complications of sinusitis are uncommon in the neonatal age group. They include orbital complications, intracranial spread, cavernous sinus thrombosis and sepsis, and less than 10 cases of orbital complications have been reported in literature.[3,4] According to the American Academy of Paediatrics guidelines, severe acute bacterial sinusitis is characterized by high fever with purulent nasal discharge lasting for over 3 to 4 days.[3] However, it is found that clinical symptoms may sometimes be subtle or even absent in the paediatric age group.[4]

Neonates and infants are found to be more vulnerable to infections as they have a developing immune system and depend on circulating antibodies obtained in utero.[4] Although healthy newborns become colonized by normal flora acquired from their mothers and the environment, incidence of disease is usually low unless local defenses are impaired by underlying disease, prematurity, or use of invasive devices.[3] In our case trauma induced by cleaning the nostrils with buds could have predisposed to infection.

The most common causative organisms causing acute sinusitis in neonates and infants are *Streptococcus pneumoneae, Haemophilus influenza* and *Moroxella catarahellis*, however with the widespread use of *Haemophilus influenza* type B and Pneumococcal vaccine the trend has been changing.[4,5] Sharma et al in a study of 11 cases of orbital complications of sinusitis found that *Staphylococcus aureus* was the most common causative organism4 as was in our study. Orbital cellulitis is closely related to *Staphylococcus ethmoiditis* and can be a serious infection in neonates often progressing to bacteremia and sepsis.[6] Atopic illness has also been found to be a predisposing factor to complications of sinus disease with a study showing atopic illness in about one third of paediatric patients who developed complications of sinusitis.[1]

Orbital complications are the most common complication of sinusitis in the paediatric age group and may occur as

the orbit is separated from the ethmoid sinus by a paper thin lamina papyracea or the presence of a congenital dehiscence.[7,8] In addition the anterior and posterior ethmoidal foramina allow passage of nerves and vessels that can provide a route for infection to spread to the orbit. Complications may also occur by haematogenous spread via retrograde valveless veins.[9] In our case however, infection involved the maxillary sinus with extention superiorly to the extraconal space of the orbit, inferiorly erosion of the hard palate and laterally extending into the infratemporal fossa, which could be explained by osteolysis as a result of acute inflammation.

As clinical symptoms may be subtle and a complete nasal endoscopic examination may not be possible in an uncooperative child, a CT scan preferably contrast enhanced should be performed in all cases of suspected complications of sinusitis.[3] Magnetic resonance imaging may be performed in cases of suspected intracranial complications. Although, radiographic studies may suggest the likelihood of a fluid collection, it is not possible to differentiate between pus containing abscess and plegmons and the diagnosis of abscess is only made during surgery with the drainage of pus, while phlegmon on the other hand reveals only granulation tissue with no growth of organisms seen on culture.[10,3]

As there is insufficient literature on complications of sinusitis in the neonatal age group whether the treatment should be conservative or surgical is subject to debate. With the advances in endoscopic sinus surgery, endoscopic drainage is now becoming the preferred modality of treatment, with open techniques being used where adequate access cannot be obtained endoscopically, owing to smaller anatomy4. In our case the child was treated conservatively with intravenous antibiotics or 48 hours, however since the child did now show any clinical improvement, endoscopic surgical drainage was carried out.

CONCLUSION

Acute bacterial sinusitis although rare in the neonatal age-group has been found to develop complications. Orbital complications in neonates secondary to ethmoidal sinusitis have been reported, however spread of infections to the infra-temporal fossa and palate secondary to maxillary sinusitis in neonates has not been reported in literature. As the clinical symptoms may be subtle, a high index of suspicion is required for early diagnosis, treatment and prevention of complications.

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