Acute Rhinosinusitis Complicated by Cortical Venous Thrombosis and Multiple Subdural Empyemas

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Abstract

Acute rhino-sinusitis is a very common outpatient condition which demands special attention when it gets complicated by the development of intracranial complications like brain abscess. But the occurrence of cortical venous thrombosis (CVT) as a complication along with subdural empyemas is an extremely rare finding; more so if found in an immunocompetent individual and is a very difficult situation to manage.

Introduction

Acute Rhino-sinusitis is a very common entity specially in young children. But most often it is a self-limiting condition with complications occurring very rarely. Extension of the infective foci to intracranial parts is an extremely rare event – which has a reported incidence of 3.7% in Indian population.¹ But to involve both the vascular tissue and parenchyma in the central nervous system, especially in an otherwise immuno-competent young individual makes the scenario a lot more difficult to manage, with very high chances of morbidity and mortality. We report one such case.

Case Report

A pre-morbidity healthy girl of 13 years, presented to the emergency department of our hospital with sudden onset right hemiparesis, proptosis and altered sensorium since the last 8 hours. On further enquiry her parents revealed that the girl had history of rhinorrhea with headache 4 days back, for which she had undergone radiographic evaluation which showed acute rhino-sinusitis involving multiple sinuses mainly on the right side (Figure 1).

There was no other significant history. In the emergency department the patient had an episode of a generalised seizures.

Post-ictally the patient developed right sided hemiplegia with a Glasgow Coma Scale of 5/15, an extensor plantar on the right side and anisocoria. Neck rigidity was absent. Fundoscopic examination showed evidence of papilledema with early optic atrophy changes in both the eyes. On the second day in hospital the patient lapsed into a coma and developed respiratory distress for which she was intubated and put on ventilatory support.

An urgent MRI brain showed multiple moderate to large sized subdural empyemas with midline shift of 0.8-1 cm (Figure 2).

MR-Venogram showed the presence of cortical venous thrombosis of the Superior Sagittal Sinus (Figure 3).

Her investigations revealed a high total leucocyte count as expected of 45,300/cmm with a predominant neutrophilic component. She was started on empirical broad spectrum antibiotics. A neurological consult was obtained and the patient was advised to undergo an immediate surgery in view of an impending herniation and possible death.

A burr hole evacuation of around 45-50 ml of foul smelling pus was done and was sent for culture and sensitivity; which later showed growth of Methicillin Resistant Staphylococcus aureus, which was susceptible to vancomycin. The patient was immediately started on the same.

Another important question was the use of heparin in cortical venous thrombosis in the presence of an abscess which is still controversial.² The

Fig. 1: MRI of the paranasal sinuses showing maxillary sinusitis

Fig. 2: MRI showing preoperative sagittal (A), transverse (B) and coronal (C) sections of the brain with multiple subdural empyemas and surrounding perilesional edema

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The patient was started on low molecular weight heparin with monitoring of her neurological and hematological parameters periodically.

The patient showed dramatic improvement over a period of 2-3 weeks with her Glasgow Coma Scale score improving to 13/15. The patient was subsequently weaned off from the ventilator after she regained voluntary respiratory effort 3 weeks later. The power in the right upper and lower limbs improved from grade I to grade III over a period of 4 weeks (Figure 4).

**Discussion**

Acute rhinosinusitis is a very common cause of outpatient consult especially among children, with an estimated incidence of 6-8 episodes in children and 2-3 episodes in adults each year. Even though most often the management is on an outpatient basis, the purpose of this article is to emphasize that these minor clinical events can acutely turn into major clinical life threatening complications like brain abscess, CVT or as in our case both. Although this event is rare, the importance lies in suspecting these conditions, early diagnosis and immediate intervention.

**Streptococcus pneumoniae** (20%-45%) and **Haemophilus influenzae** (22%-35%) are the most important organisms causing bacterial rhino-sinusitis in adults, whereas S. pneumoniae (30%-43%), H. influenzae (20%-28%), and Moraxella catarrhalis (20%-28%) are the predominant organisms in children. Although Staphylococcus aureus was previously thought to be a contaminant, a 2007 meta-analysis has confirmed that this organism should now be considered a real pathogen, accounting for 8% to 10% of adult cases. It is important to look for subtle neurological signs and symptoms like headache, altered sensorium, vomiting, neck rigidity, focal deficits, papilledema etc, early to prevent deadly complications and initiate appropriate treatment faster. More importantly we recommend imaging of the brain in such individuals with a high index of suspicion without delay. In such patients empirical treatment with antibiotics like vancomycin is also ideal.

The importance of this article is to emphasize the rarity of the combination of sinusitis with brain abscesses and cortical venous thrombosis. Also in most of these cases the development of abscess is late. But in our case the occurrence of all the three was simultaneous, which is extremely rare. Besides, the occurrence of coma in such cases carries a very poor prognosis. Subdural abscesses have high morbidity and mortality. As many as 25% to 35% of patients who do survive have permanent neurologic sequelae. But our patient had drastic improvement following treatment.

**Conclusion**

We reiterate the need for an early diagnosis and initiation of treatment immediately.

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