

Nasal septal abscess as a sequela of orbital cellulitis: An uncommon presentation

SAGE Open Medical Case Reports
Volume 6: 1–3
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DOI: 10.1177/2050313X18778726
journals.sagepub.com/home/sco



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Abstract

Nasal septal abscess is a rather unusual condition encountered in the Otorhinolaryngology outpatient department, let alone it being a complication of orbital cellulitis! The condition usually occurs due to trauma which is significant enough to cause a septal haematoma. The haematoma then eventually results in formation of a localised abscess. Orbital cellulitis as a sequela of nasal septal abscess is an established complication but vice versa, septal abscess as a sequela of orbital cellulitis is an extremely rare presentation. To emphasise the possibility of anterograde as well as retrograde passage of infection via valveless veins in the face, we report a unique case of a 2-month-old infant who developed nasal septal abscess as a complication of orbital cellulitis.

Keywords

Nasal septal abscess, orbital cellulitis, venous drainage of nose, nasal obstruction, computed tomography scan

Date received: 24 November 2017; accepted: 30 April 2018

Introduction

Nasal septal abscess (NSA) usually follows trauma significant enough to cause a septal haematoma. The haematoma may eventually get infected and results lead to localised abscess. Other less common causes include infections from adjacent areas.¹

NSA, if left untreated, can lead to severe complications involving the orbit and intracranial structures.²

Orbital cellulitis secondary to NSA is an established complication but vice versa septal abscess arising secondary to orbital cellulitis is a rather unique scenario.² Available means of electronic literature research were employed and there seems to be no similar case reported in English language.

Case report

Our patient was a 2-month-old infant who was admitted under joint care of ophthalmology and paediatrics in the children ward with an eyelid infection (stye) that was not responsive to oral antibiotics and had complicated into orbital cellulitis. The infant was running a high-grade fever and was under treatment with intravenous ceftriaxone 70 mg/kg/day.

During hospital stay, on fourth day of admission, the mother had noticed the baby's inability to breathe from his

nose and subsequent difficulty in feeding. Ear, nose and throat (ENT) team was then involved which thoroughly evaluated the patient.

On examination, a fusiform swelling was noted on anterior rhinoscopy that exhibited bilaterally along the septum, was fluctuant on both sides, and was resulting in obliteration of the nasal airway. A suspicion of NSA was raised and further investigations commenced. Patient did not demonstrate any signs or symptoms of intracranial involvement.

Computed tomographic studies of the infant's nose and paranasal sinuses revealed a well-defined, thick-walled, marginally enhancing fusiform swelling involving anterior septum. Other than this, there was oedematous and mildly enhancing preseptal space and soft tissues along lateral

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Figure 1. CT scan of nose and PNS axial view showing significant proptosis of right eye.

orbital wall and zygoma on the right side. Overall findings were conclusive of NSA, right-sided orbital cellulitis with no computed tomography (CT) evidence of any intracranial involvement (Figures 1 and 2).

After radiological evidence coincided with the suspicion made on clinical basis, the infant was taken to theatre. We were able to aspirate 1.5 mL of thick pus and noted complete resorption of underlying cartilage which confirmed the diagnosis of septal abscess. Postoperatively, treatment with intravenous cefuroxime was initiated, in view of the better Gram-positive coverage of second-generation cephalosporins as compared to ceftriaxone, a third-generation cephalosporin.

The pus was sent for culture and sensitivity but revealed no growth after standard incubation at 37°C, which was expected as the child was already being treated with intravenous antibiotics.

The patient responded very well to the treatment, that is, surgical drainage followed by cefuroxime. He was followed up on regular basis postoperatively and showed complete recovery.

Discussion

An NSA may be described as a collection of purulent material between the cartilaginous or bony septum and its mucoperichondrium or mucoperiosteum.³

The aetiology of NSA is very diverse. It may result from adjacent infection like vestibulitis, dental abscesses, infected dentigerous cyst, acute ethmoiditis, acute sphenoiditis, and localised nasal sinusitis.^{3,4} Cases of spontaneous and idiopathic NSA have also been reported.⁴ However, nasal trauma is by far the most common cause of NSA and it is estimated that nearly 75% cases are secondary to this.⁴

In our case, there was no history of nasal trauma, nor any other aforementioned causes. The sole reason in the infant under discussion is therefore the pre-existing orbital cellulitis that led to NSA formation on the seventh



Figure 2. CT scan of nose and PNS coronal view.

day of beginning of eyelid infection. To understand the mechanism by which orbital cellulitis led to NSA formation in our case, we must first recall the venous drainage of the nose. The veins in the face that are responsible for draining the nose are valveless and follow their respective arteries. Anterior and posterior ethmoidal veins drain via the ophthalmic veins into the cavernous sinus. Similarly, angular veins drain the external nose into the cavernous sinus through the ophthalmic veins as well. The sphenopalatine veins drain into the pterygoid plexus which in turn drains into the internal jugular vein. The absence of valves provides for the passageway through which spread of infection can occur in both anterograde and retrograde direction.^{5,6} This retrograde spread of infectious process through valveless ophthalmic veins is responsible for the unusual presentation of NSA secondary to orbital cellulitis in our case.

The symptoms of NSA include nasal pain and tenderness, rhinorrhoea, headache, fever, malaise, and almost always bilateral nasal obstruction.^{3,7,8} Whereas the signs are a smooth, round, fluctuant deep red or grey swelling of the nasal septum and in cases of late presentation, saddle nose deformity.^{3,8}

Most common organism isolated from NSA is *Staphylococcus aureus*. Various species of *Streptococcus* and anaerobes, though less frequently, have also been cultured. In paediatric patients, *Haemophilus influenzae* may also be found.⁹

As far as the management of NSA is concerned, prompt surgery is the mainstay of treatment to avoid complications.¹⁰ When the diagnosis of NSA is made, empirical treatment with a broad-spectrum antibiotic that crosses the blood–brain barrier can be started prior to surgical drainage, in order to prevent life-threatening complications. Once the culture and sensitivity of pus is obtained, drug therapy may be modified against the specific organism isolated.⁴

Serious and life-threatening complications of NSA include osteomyelitis, orbital cellulitis, orbital abscess, intracranial abscess, meningitis, and cavernous sinus thrombosis.² These complications can arise from several possible routes: contiguous spread to orbit, through venous communication between nasal septum, orbital veins and cavernous sinus, through lymphatics of superior meatus to subarachnoid space or finally along the perineural sheath of olfactory nerve.¹ In children, the bony walls are thin and porous and the suture lines are open, this accounts for early spread of nasal infection to adjacent sites.¹¹ Usually the infection spreads from the nose towards orbit on account of the venous drainage, as elaborated above. But in our case, a retrograde pattern was followed by the infection from the orbit to the nasal septum which makes this an extremely unusual presentation.

Conclusion

By bringing this case forward, we aim to propose that in cases of primary orbital infections, the probability of a complication of NSA should be borne in mind and the diagnosis follows a high index of suspicion.

Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Ethical approval

Our institution does not require ethical approval for reporting individual cases or case series.

Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

Informed consent

Written informed consent was obtained from a legally authorised representative(s) for anonymised patient information to be published in this article.

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