

Nasal septal abscess complicating isolated acute sphenoiditis: case report and literature review

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Abstract. *Nasal septal abscess complicating isolated acute sphenoiditis: case report and literature review.* This report presents an extremely rare case of nasal septal abscess complicating acute sphenoiditis in a non-immunocompromised adult patient. A 56-year-old woman came to our emergency service with a 2 wk history of nasal obstruction, headache, and facial pain. A nontraumatic nasal septal abscess complicating acute isolated sphenoiditis was diagnosed. Under general anaesthesia, we drained the septal abscess and performed an endoscopic transnasal sphenoidotomy. Bacteriological cultures revealed viridans streptococci in the septal abscess and sphenoid cavity. We discuss the patient's diagnosis, possible complications, and treatment. There are limited reports in the literature on this subject. Our report emphasizes the need to determine whether an infection is associated with a non-traumatic nasal septal abscess. The incidence of severe complications is directly related to delays in diagnosis and treatment. Therefore, a prompt and correct diagnosis immediately followed by appropriate treatment is necessary.

Introduction

Nontraumatic nasal septal abscess (nt-NSA) is a rare occurrence, and isolated sphenoid sinus infection associated with nt-NSA is rarer still. Here, we present the case of a 56-year-old woman with a nasal septal abscess and sphenoiditis. A high index of clinical suspicion is necessary to formulate a correct etiological diagnosis of nt-NSA. Serious complications may occur from both NSA and sphenoid infection if diagnosis and treatment is incorrect or delayed.

Case report

A 56-year-old woman presented herself at our emergency service with a 2 wk history of nasal obstruction, headache, and facial pain. Anterior rhinoscopy demonstrated a bilateral, fluctuant, red bulging of the septum that obstructed both nasal cavities. Oral examination revealed good

oral hygiene, no signs of dental disease, and no abnormality of the alveolar process of the maxilla. She denied any history of trauma, nasal surgery, dental disease, bleeding tendency, or diabetes mellitus. Her body temperature was 38.8°C, and her white blood cell count was 12,470/mm³ with a differential count of 85.9% neutrophils. Her medical history included house dust mite allergic rhinitis and hypertension.

An urgent plain computed tomogram showed fluid collection within the bony and cartilaginous nasal septum and isolated complete opacification of the right sphenoid sinus with a left sphenoid sinus hypoplasia (Figure 1). The fluid collection did not appear to reach the sphenoidal crest. No signs of recent or previous bone fractures or anterior skull base dehiscences were detected.

Under general anaesthesia, we drained the septal abscess and performed an endoscopic transnasal

right sphenoidotomy with direct paraseptal approach. A small amount of necrotic septal cartilage was removed; no Penrose drain was inserted. The purulent septal and sphenoidal material was sent separately for microscopic and bacterial work-up. Bilateral nasal packing was inserted and removed 72 h later. Intravenous piperacillin/tazobactam was administered.

Both bacteriological cultures revealed viridans streptococcus that was not resistant to the prescribed antibiotics. After 7 d, the patient was discharged with total relief from the presenting symptoms and a bilaterally patent nasal airway, although a mild saddle-nose deformity was already evident. An ambulatory orthopantomogram was obtained and no signs of dental infection were detected. Eight weeks after the discharge, the destroyed septal infrastructure was reconstructed using fragments of the bony



Figure 1

CT axial view showing fluid collection within the nasal septum and complete opacification of the right sphenoid sinus with a left sphenoid sinus hypoplasia.

septum. After a 14 mo follow-up period, the patient showed satisfactory functional and aesthetic results.

Discussion and literature review

NSA is an unusual entity. It is defined as a collection of purulent material between the cartilaginous or bony septum and the mucoperichondrium or mucoperiosteum.¹ According to Ambrus *et al.*¹ and Canty *et al.*,² 75% of NSA are caused by nasal trauma. Iatrogenic NSA is a complication of septal surgery,³ although Hariri *et al.*⁴ reported a case of NSA caused by nasotracheal intubation.

nt-NSA is a rare infection that is considered to be a complication of infections extending from neighboring tissues, mostly from dental infections and sinus infections.³ Other rare etiologies have been described, such as a furuncle of the nasal vestibule or a flu virus.³ Cho *et al.*⁵ described an NSA as an unusual presentation of a dentigerous cyst. In immunocompromised patients, NSA can

be secondary to a distant infection.³ Other conditions that can cause swelling of the nasal septum are hematoma, meningoencephalocele and tumours.

The most common symptom of NSA is nasal obstruction, mostly bilateral; other symptoms are rhinorrhea, fever, headache, and facial pain.^{1,2} A thorough medical history and physical examination are the most valuable diagnostic keys. Past or present trauma, nasal surgery, dental disease/extraction, bleeding tendency, and immunocompromising conditions must be explored further.

In patients with NSA, anterior rhinoscopy reveals a red/purple or sometimes grey bulging of the nasal septum; most frequently, the bulging is bilateral and anterior and obstructs both nasal cavities. Ambrus and George have described extremely rare cases of posterior NSA.^{1,6} Gentle palpation reveals the fluctuant nature of this nasal septum enlargement. The diagnosis of a septal abscess is confirmed by needle aspiration of purulent material. The most com-

monly cultured organism is *Staphylococcus aureus*. Other organisms include *Streptococcus pneumoniae*, viridans streptococci, *Staphylococcus epidermidis*, and *Haemophilus influenzae*.^{3,5} Anaerobic bacteria have also been recovered from NSA.⁷

Paranasal sinus CT is of paramount importance when evaluating the extent of the abscess and the presence of possible complications; it is especially necessary for making an etiological diagnosis when nt-NSA is suspected.⁸ Orthopantomograms are also useful for investigating dental infections.⁵ In patients with no history of trauma or surgery, searching for an associated infection is necessary to obtain a correct diagnosis and to state an appropriate treatment plan.

Two main treatments are described in the literature: surgical drainage and surgical drainage immediately followed by reconstruction of the destroyed septal cartilage.⁹ In the case of nt-NSA with an identified infection focus, the latter should be treated at the same time as the NSA. Broad-spectrum antibiotic therapy should be started immediately and then adjusted according to the culture report. When late functional and aesthetic complications are expected, reconstruction of the nasal septum should be considered and discussed with the patient. Cottle proposed performing implantation of the nasal septum within 8-12 wk of the beginning of treatment of the abscess, when resolution of the infection could ensure a successful treatment. Later, Huizing and Masing proposed septal reconstruction at the same time as drainage. Various authors have adopted the latter treatment

and reported satisfactory results. Hellmich suggested three possible options for reconstruction of the destroyed septal infrastructure: (1) Using posterior cartilage or bony septum residues to adjust deformities in the anterior septum ("exchange technique"). (2) Mosaicplasty with small fragments of residual cartilage. (3) Using preserved rib cartilage allografts when septal material is not available.⁹

We present a rare case of nt-NSA in association with an isolated sphenoid sinus infection; there are limited reports in the literature on this subject. In 1986, Matsuba *et al.*¹⁰ reported an isolated sphenoid sinus infection that led to an NSA. In 2002, Pang *et al.*¹¹ described an NSA complicating acute pansinusitis in a child. In 2007, Lin *et al.*⁸ reported a case of NSA in association with acute unilateral maxillary-ethmoid sinusitis and right facial cellulitis in a child. That same year, George *et al.*⁶ described a rare case of posterior NSA associated with acute sinusitis.

In the previously mentioned article by Pang *et al.*,¹¹ the author proposed a mechanism to explain the spread of infection from the sphenoid sinus to the nasal septum: a direct subperiosteal extension of the anterior surface of the sphenoid bone, stripping the periosteum of the vomer and the perpendicular plate of ethmoid to the subperichondrial surface of the quadrangular cartilage. Other possible mechanisms include direct spread through the bony fissures, congenital bony deformities, and thrombophlebitis.¹¹

Our report emphasizes the need to search for an associated infection in patients with nt-NSA. Thus, paranasal sinus CT is

mandatory. We found an isolated sphenoid sinus infection associated with the NSA and performed surgical drainage of the NSA and an endoscopic transnasal sphenoidotomy at the same time.

Serious complications, such as severe functional and cosmetic nasal sequelae, meningitis, brain abscess, subarachnoid empyema, cavernous sinus thrombosis, and orbital cellulitis may occur as the result of an NSA.^{3,8} Sepsis can be a life-threatening complication in immunocompromised patients.¹² Moreover, orbital cellulitis and abscess, orbital apex syndrome, blindness, meningitis, epidural, subdural and brain abscess, pituitary abscess, cavernous sinus thrombosis, and internal carotid artery thrombosis may arise from acute sphenoiditis.^{13,14} The incidence of severe complications is directly related to delays in diagnosis and treatment.⁸ Therefore, a prompt and correct diagnosis immediately followed by appropriate treatment is necessary.

Conclusion

The case we described underlines the importance of an etiological diagnosis and prompt treatment to avoid complications due to the NSA and any other infectious foci.

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