

Main Article

Ivy Drake takes responsibility for the integrity of the content of the paper

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Abstract

Background. This paper reports a 10-year series of spontaneous nasal septal abscesses in immune-competent children, with suggestions for optimal management.

Methods. A retrospective case note review was conducted of children undergoing an operation for incision and drainage of nasal septal abscesses between 2013 and 2023.

Results. Six children were identified via electronic hospital records during the 10-year review period, five with a spontaneous abscess. The children were aged 10–14 years. All were immunocompetent and none had active sinus infection. The most common presenting features were nasal swelling, facial swelling, headache, nasal congestion and fever. The most common bacterial isolate was *Staphylococcus aureus*. All children received prompt surgical drainage and intravenous antibiotic therapy. Complications were seen in three children, with one child developing significant intracranial complications.

Conclusion. To our knowledge, this is the first series of spontaneous nasal septal abscesses in immunocompetent children. The high prevalence of *Staphylococcus aureus* suggests spread from the nasal mucosa or vestibule. Early recognition, computed tomography scanning, surgical drainage and antibiotic therapy are the mainstays of treatment, to prevent potentially life-threatening complications.

Introduction

A septal abscess is a rare condition in children that can therefore be difficult to recognise. Without prompt diagnosis and management, it can lead to destruction of septal cartilage and life-threatening intracranial complications. In about 85 per cent of cases, the abscess is a result of blunt force nasal trauma and infection of a septal haematoma. Trauma, and therefore infected nasal septal haematoma, is more common in adolescent males.^{1–3}

Septal abscesses have also been described in association with acute rhinosinusitis, with the presumption that infection has spread from the paranasal sinuses to the septum. A spontaneous abscess within the nasal septum is much less common. Most cases have occurred in immunocompromised individuals; descriptions of spontaneous abscess in immunocompetent children are limited to reports of one or two cases.^{1,4–6} The source of infection in these cases is unknown.

This paper aims to report our experience of spontaneous nasal septal abscesses in immunocompetent children. We aim to raise awareness of this rare condition and to inform clinicians about optimal strategies for management.

Materials and methods

Ethical considerations

As this was a retrospective and anonymised audit of routine clinical practice, no specific ethical committee permissions were required for this study within our institution. All data were handled in accordance with Caldicott principles.

Data collection

All children (aged 0–16 years) who were admitted for the management of nasal septal abscesses between January 2013 and September 2023 were initially identified retrospectively through the hospital's electronic surgical management system. We reviewed their electronic patient records to extract key clinical and demographic data.

Results

Six children were identified with nasal septal abscesses between January 2013 and September 2023. One child was found to have suffered nasal trauma the week prior to presentation and was therefore excluded from further analysis.

Five children had a spontaneous nasal septal abscess with no prior history of trauma. Four of the children were male. None of the patients were immunocompromised in any way, and none had any evidence of paranasal sinus infection. Their ages ranged from 10.5

Table 1. Clinical features of the five children in this series

Patient number	Presenting symptoms	Age (years)	Sex	Laterality of abscess	Microbiology	Complications
1	Facial swelling, pyrexia, nasal discharge, sore throat	10	M	Left	<i>Staphylococcus simulans</i>	Nasal adhesions & inflammation
2	Headache, nasal swelling, pyrexia, meningism	10	M	Bilateral	<i>Staphylococcus aureus</i> , <i>Streptococcus intermedius</i>	Right extradural empyema + temporal lobe abscess & cavernous sinus thrombosis
3	Nasal swelling, headache, facial pain, lethargy	13	M	Bilateral	<i>Staphylococcus aureus</i>	None
4	Nasal congestion, nasal swelling, headache	13	F	Left	MRSA	Re-accumulation of abscess, cartilaginous necrosis of nasal septum
5	Nasal swelling, nasal congestion, facial pain, facial swelling	12	M	Right	<i>Staphylococcus intermedius</i>	None

M = male; F = female; MRSA = methicillin-resistant *Staphylococcus aureus*

years to 13.8 years at the time of presentation, with a mean age of 12 years. One child had a history of mild, well-controlled asthma, but none of the others had any medical history of note.

The five cases are summarised in Table 1. The most common presenting features were nasal swelling, facial swelling, headache, nasal congestion and fever. Two abscesses were bilateral, two left-sided and one right-sided. Four children underwent computed tomography (CT) scanning with contrast prior to surgery. Example scans are shown in Figures 1 and 2.

In all five cases, the septal abscesses were drained under general anaesthesia within 24 hours of admission and the children were treated with intravenous antibiotics.

Microbiology results are shown in Table 1; the most common organism identified was *Staphylococcus aureus*.

One child whose abscess was due to methicillin-resistant *S aureus* (MRSA) re-presented to hospital 3 days after the original drainage procedure with a re-accumulation of the abscess, requiring a second drainage procedure. This child had initially been treated with co-amoxiclav, but the treatment was changed to vancomycin and clindamycin once the microbiology culture results were known.

One child had a protracted course. He had a cavernous sinus thrombosis noted on his CT scan at presentation. He was treated with drainage of the septal abscess and intravenous antibiotics. His clinical condition failed to improve after surgery, so he returned to the operating theatre on day 3 for repeat surgical drainage and functional endoscopic sinus surgery. Intra-operatively, complete destruction of the cartilaginous nasal septum was observed. Again, the patient failed to improve. Magnetic resonance imaging scans performed on



Figure 1. Axial computed tomography scan from a 13-year-old female showing a right-sided nasal septal abscess in the absence of sinus disease.

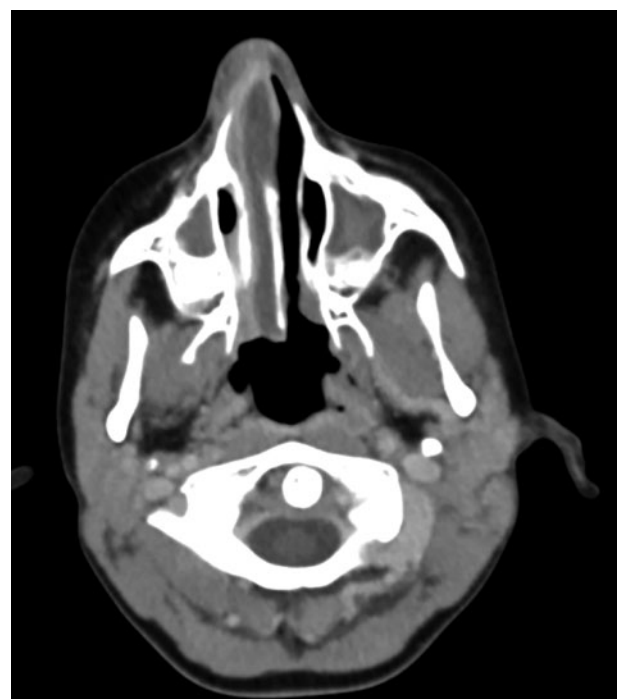


Figure 2. Axial computed tomography scan from a 12-year-old boy showing a right-sided nasal septal abscess extending along the full length of the nasal septum.

day 7 showed an extradural abscess and a temporal lobe abscess on the right side. These were drained by the neurosurgical team. The patient stayed in hospital for 5 weeks of intravenous antibiotics and completed a further 6.5 weeks of oral antibiotics at home. He eventually made a full recovery.

One other child was noted to have some cartilage necrosis during their drainage procedure.

To date, no children have re-presented with septal perforation or saddle deformities.

Discussion

Strengths and weaknesses

Nasal septal abscesses are rare in children. Previously reported series have been small in number, and have mainly focused on disease secondary to immunocompromise, trauma or sinus disease.^{3,4,6,7} We have, so far, only been able to identify single case reports of spontaneous nasal septal abscesses in children.^{2,5,8–11} We present five immunocompetent children with spontaneous nasal septal abscesses in the absence of trauma or sinus disease. Obviously, our study is retrospective in nature and therefore limited by the completeness and accuracy of the information recorded in the patient records. However, we believe we have identified a few key issues that should be of use to clinicians dealing with this condition.

Clinical implications

Awareness is key to the early diagnosis and management of any condition, but especially if the condition is rare or obscure. A nasal septal abscess is usually apparent as an easily visible swelling of the septum. This diagnosis should be considered in any adolescent male who presents with nasal obstruction, headache and pyrexia. *Staphylococcus aureus* appears to be the most common bacterium isolated, suggesting an origin from the nasal mucosa or nasal vestibulitis.^{2,3}

Management should include early contrast-enhanced CT scanning of the brain and sinuses, surgical drainage, and empirical treatment with intravenous antibiotics directed at *S aureus*. In children who fail to improve, antibiotic therapy should be guided by microbiological culture results, and clinicians should be aware of the possibility of MRSA.^{1,5}

- Spontaneous nasal septal abscesses are rare, but typically present with nasal obstruction, pyrexia and headache
- The causative organism tends to be *Staphylococcus aureus*
- Mainstay of management is a contrast-enhanced computed tomography head scan, urgent surgical drainage and intravenous anti-staphylococcal antibiotics
- Without prompt diagnosis and treatment, septal abscesses can easily spread intracranially and cause life-threatening complications

Septal abscesses have a high incidence of intracranial infection because of their location within the 'danger triangle' of the face and their proximity to the skull base. Intracranial complications can be life-threatening. One child in our series developed a right-sided extradural empyema, cerebral abscess and cavernous sinus thrombosis stemming from a septal abscess, requiring multiple surgical drainages, a prolonged hospital admission time and prolonged antibiotic therapy.^{1,8,12}

Conclusion

Clinicians should be aware of the possibility of a nasal septal abscess in children aged 10 years or older who present with nasal obstruction, headache and fever, even in the absence of trauma or immune suppression. Intracranial complications are common and potentially very serious. The diagnosis is confirmed on contrast-enhanced CT scans of the sinuses and brain. Management should begin with prompt surgical drainage and intravenous antibiotics, including cover for *S aureus*.

Data availability statement. The data that support the findings of this study are available from the corresponding author upon reasonable request.

Competing interests. None declared

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