CASE REPORT

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Late-onset posttraumatic septal hematoma and abscess formation in a six-year-old Tamil girl – Case report and literature review*

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SUMMARY

Nasal septal hematoma with abscess (NSHA) is an uncommon complication of trauma and studies on children are especially rare. We discuss the case of a 6-year-old girl, who was initially evaluated independently by three doctors for minor nasal trauma but had to be re-hospitalized 6 days later with NSHA. Although septal hematoma had initially been excluded (5, 7 and 24 hours after trauma), a secondary accumulation of blood seems to have occured. Delayed hematoma formation has been described in the orbit as a result of possible venous injuries after endoscopic sinus surgery. However, such an observation is new for septal hematoma in children. Thus, we recommend re-evaluation for septal hematoma 48h to 72h after paediatric nasal trauma. Such a scheduled re-examination offers a chance to treat delayed subperichondral hematoma on time before almost inevitable superinfection leads to abscess formation and destruction of the nasal infrastructure. We suggest that parents should be vigilant for delayed nasal obstruction as possible herald of hematoma accumulation within the first week.

Key words: paediatric, nasal trauma, septal hematoma, abscess, delayed onset, complication

INTRODUCTION

Minor nasal traumas are frequent in paediatric traumatology. However, detection of septal abscess with hematoma (NSHA) represents a rare but feared sequel associated with a high morbidity and potential mortality because of cerebral spread of the infection. NSHA once diagnosed is one of the rare rhinosurgical emergency situations, with an urgent operation required in order to save septal cartilage at risk and prevent subsequent mutilating complications. Case series of NSHA in paediatric populations are rare and the evolution of the disease in its latent phase has hardly ever been studied. Even if NSHA can be ruled out by an initial thorough examination, significant delayed hematoma accumulation and superinfection is nevertheless possible, especially in the absence of major trauma (i.e. fracture of nasal bones).

CASE REPORT

A six-year-old Tamil girl presented at the surgical emergency department of a paediatric tertiary referal center after falling one meter from a playground climbing construction onto the right side of her face. Five hours after trauma, the intern of paediatric surgery who initially treated her (DF) diagnosed right frontal contusion and skin erosion, paranasal discrete swelling and slightly diminished nasal breathing after self-limited epistaxis. Plain conventional radiograms ruled out fracture of the nose and injury of neighbouring structures (Figure 1). Seven hours after trauma and prior to discharge, the child was presented to the ENT resident (JC) on call, who confirmed the diagnosis describing slight excoriation at the inferior part of the vestibulum nasi without septal hematoma. Symptomatic therapy with a decongestant nasal spray and pain medication

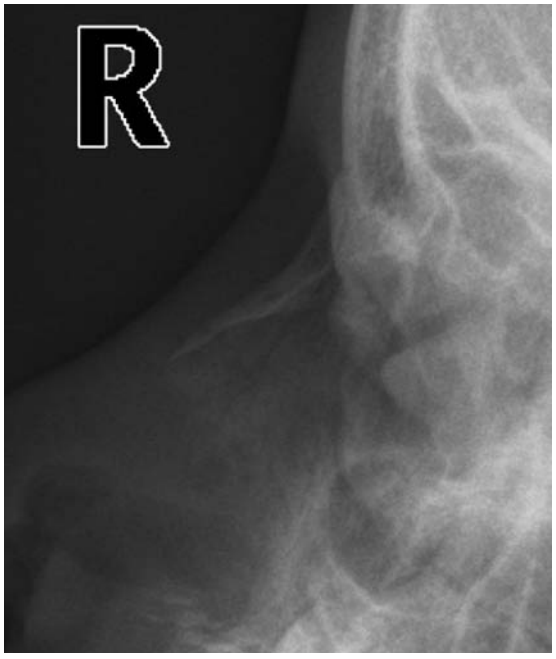

Figure 1. Normal conventional X-ray of the nose at the day of trauma.

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Figure 2. Six year old, Tamil girl at re-admission six days after trauma with nasal septal hematoma with abscess (NSHA). Marked paranasal swelling, old infraorbital hematoma with obstruction and crusting of both nostrils (with permission).

Figure 3. Axial and coronal CT: Demonstrating septal swelling, central hypodensity with complete obliteration of the nasal cavities which corresponded to the septal hematoma with abscess during surgical drainage.

was prescribed. Follow-up evaluation the next evening by another paediatrician (SB) showed serous secretion in the nose with improved breathing after nasal saline rinsing. According to the parents, there was prompt regression of the paranasal swelling. However, five days later the child developed the swelling again with sudden onset of fever.

On re-admission, at day 6, the girl was somnolent with slight dehydration and fever of 39°C. She showed marked bilateral swelling of the dorsum of the nose and an old greenish periorbital hematoma of the right eye (Figure 2). Anterior rhinoscopy revealed complete bilateral nasal obstruction by massive septal swelling with extensive blood crusts. CRP was elevated at 52 mg/l and the peripheral WBC was 13.9 x10^9/l without a left-shift. An immediate CT with contrast enhancement demonstrated septal swelling with a central hypodense area consistent with a collection of fluid leading to total obliteration of the nasal cavity (Figure 3). There was no evidence of a concomitant fracture of the nasal skeleton or neighbouring venous sinus thrombosis.

Immediate operation under general anaesthesia after the first dose of intravenous amoxicillin-clavulanate (44 mg/kg per dose) with drainage of the septal swelling yielded sero-purulent material and confirmed the diagnosis of NSHA. Approaching the abscess by hemitransfixation incision, the NSHA was completely drained (MI, PD). The remnants of the septum were still strong enough to provide support and there was no need for grafting of autologous cartilage for direct implantation. An additional cut on the left side allowed bilateral insertion of drains and nasal packing.

The direct gram stain of pus demonstrated, beside leucocytes and erythrocytes, no bacteria as an early clue for the causative germ. Bacterial culture identified penicillin-susceptible *Streptococcus pneumoniae.* Intravenous amoxicillin-clavulanate was administered for 5 days and was then switched to the oral form (dose 24 mg/kg/d divided in 2 doses). Drains and nasal packing were removed on the fifth day and the child was discharged the next morning. On evaluation 15 months after the trauma, the girl did not complain of any nasal symptoms; her mother noticed only discrete pronounced nasal sounds during sleep at night. There was neither apparent contraction by scarring, nor saddle nose nor an instable tip (Figure 4).

DISCUSSION

Posttraumatic nasal septal hematoma in childhood is very unusual and case series are still sparse [1,2]. NSHA is not typically associated with a major trauma. In series published up to now, clinically or radiologically confirmed fracture was present with posttraumatic nasal hematoma in a minority of cases only; i.e. in 12.5% according to Alvarez [1], in 8% (2 of 25 cases) according to Blahova [3], but in 37.5% (3 of 8 cases) in the study of Dispenza [4]. Because its most common symptoms are mild nasal obstruction and repeated epistaxis, NSHA can go unnoticed, especially in young children or patients with poor social resources [4,5].

Untreated septal hematoma is believed to undergo almost invariably superinfection and abscess formation with destruction of the septal cartilage followed by potentially lethal infectious complications. Abscess formation represents one of the rare emergency situations in rhinosurgery. The rates of poten-

Figure 4. Follow-up of the asymptomatic patient 15 months after the operation (with permission).

tially lethal infectious complication or subsequent mutilating destruction of the nasal cartilage and scarring are directly related to time delay in diagnosis and treatment [1].

The delay in treatment is not always the result of lack of recognition of the subtle clinical symptoms by the initially treating doctor. This case report illustrates that NSHA can develop with a delay of several days and with subtle signs. Marked swelling, overt fracture signs and nasal deformity are not typically present and, without detailed examination, the diagnosis of hematoma can be delayed until major complications develop. Our patient developed fever with moderate elevation of CRP and WBC. Fever or WBC count elevation, nevertheless, are inconsistent findings of NSHA and have been described in 50% and 60%, respectively [5]. Superinfection in posttraumatic NSHA is mainly caused by *Staphyloccoccus aureus* and *Streptococcus sp.*, hence empirical parenteral therapy with an anti-staphylococcal penicillin or cephalosporin or with clindamycin is recommended [1] until definitive culture and antimicrobial susceptibility of the causative organism are available.

This case illustrates that even a clinically and radiologically normal appearing septum 24 hours after trauma may still allow a delayed development of NSAH. Conventional X-rays are not cost effective in surgical decision making for a fracture of the nasal bones and they are not sensitive enough to rule out nasal septal hematoma or abscess [6].

In our patient, the initial phase of hematoma accumulation was dangerously silent and delayed with unnoticed reduced nasal breathing until fully developed into the septal abscess detected on day six. Most NSHA described in the literature were diagnosed with a similar mean time delay after trauma, i.e. 4.5 (range 2-14) days [7], 6.5 (range 2 to 14) days [5], 8 days [1,4], or 6.5 days [2]. A similar type of delayed-onset venous hematoma has been described for the orbit in the systematic study of 3500 endoscopic sinus surgeries [8]. To our knowledge, a delayed accumulation of septal hematoma was never described for NSHA and could either be explained by slowly accumulating blood of injured small veins or by secondary arterial bleeding after remission of vasospam or a clot.

Immediate drainage of the abscess and reconstruction of missing septal parts even in the presence of infection [9] together with a vital mucoperichondrium [10] seem to be the most important factors preventing early nasal instability and later saddle nose or even mid-facial hypoplasia.

CONCLUSION

We present a well-documented case of late onset NSHA which developed, after a deceitfully unremarkable interval, more than 24 hours after trauma and after three independent examiners and conventional X-ray examinations ruled out major nasal trauma. Thus, a second clinical re-examination seems to be reasonable 48 to 72 hours after trauma as it is routinely performed for a reliable assessment of nasal fracture after remission of swelling. On each examination, it is important to consider that even unilateral septal hematoma undergoes almost invariably superinfection and can lead to bilateral abscess formation via destruction and perforation of the cartilaginous septum [5]. At each clinical examination, the parents should be instructed to test nasal breathing regularly in the first week after trauma and to be vigilant if nasal congestion reappears as first possible herald of hematoma accumulation before external swelling and systemic complications manifest. NSHA are rarely associated with major trauma, i.e. fracture of nasal bones. Conventional X-rays are not useful in the management of nasal trauma or NSHA, and a normal x-ray report should never be used as a substitute for a thorough examination [6].

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