

# Nasalseptal hematoma/abscess: management and outcome in a tertiary hospital of a developing country

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**Background:** Nasal hematoma/abscess is an uncommon entity, but capable of leading to serious consequences if not handled meticulously, and with urgency.

**Objective:** To present the management, and outcome of nasal septal hematoma/abscess in a Nigerian tertiary institution.

**Method:** Consecutive patients diagnosed with nasal septal hematoma/abscess over a 10-year period, treated at the University of Nigeria Teaching Hospital, Enugu, Nigeria, were prospectively studied. The processes leading to diagnosis, treatment, and outcome were sequentially evaluated.

**Results:** Fifty-three patients (37 males and 16 females), age 5–65 years (with mean age of 23.10 years), were included. Surgical drainage of the hematoma/abscess, intranasal packing with insertion of drain was performed with total resolution of problem in all the cases.

**Conclusion:** Incision and drainage, and intranasal packing with insertion of drain was effective in treating nasal septal hematoma/abscess.

**Keywords:** septal hematoma, abscess, facial deformity

## Introduction

The nose is the most prominent facial structure. This makes it one of the most injury prone structures in the body<sup>1</sup> and the nasal bone the most commonly fractured bone in the human skeleton. It stands to reason to expect that septal hematoma/abscess will be a common occurrence, however on the contrary, septal hematomas/abscesses are unusual.<sup>1–8</sup> Most cases of septal hematomas/abscesses arise from the nasal injury.<sup>2–6</sup>

Nasal septal hematoma/abscess is a collection of blood/pus between the cartilaginous or bony septum and its adjoining mucoperichondrium or mucoperiosteum. This is commonly caused by trauma. Other etiologic factors noted are nasal surgery, ethmoid or sphenoid sinusitis, dental abscess, nasal furuncle, and tobacco snuffing.<sup>3,7,8</sup> It occurs less frequently after furunculosis of the nasal vestibule, sinusitis, influenza, and dental infections.<sup>9</sup> Spontaneous hematomas have been described.<sup>8</sup> Immunodeficiency<sup>10</sup> from Human Immunodeficiency Virus (HIV), insulin-dependent diabetes mellitus, and sarcoidosis have been reported as etiological factors.

A relatively small percentage of patients with nasal trauma will develop septal hematoma.<sup>11</sup> The hematoma results from leakage or rupture of the mucoperichondrial blood vessels leading to sub-mucoperichondrial/periosteal hemorrhage. A buckling stress tears the sub-mucosal blood vessels. An incidence of 15% has been reported in cases of nasal bone fractures, thus suggesting a fairly strong association.<sup>6</sup> It could be iatrogenic following any kind of nasal surgeries, including major functional endoscopic

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sinus surgery, septal surgeries such as sub-mucosal resection, septoplasty, and septorhinoplasty, and a variety of turbinate surgeries.<sup>12</sup>

Septal hematoma/abscess is a surgical emergency that deserves prompt attention because it can produce a significant nasal functional (airway) or cosmetic disturbance, and occasionally, other serious life-threatening complications. This ranges from destruction of the cartilaginous nasal septum, with subsequent saddle deformity of the nose and intracranial complications, including meningitis, cerebral abscess, subarachnoid empyema, and cavernous thrombosis.<sup>3,6</sup> Depending on the age of onset and the extent and site of septal cartilage destruction/loss, the nose and maxilla can suffer from growth inhibition.<sup>13–16</sup> In childhood, the nasal septum has two major growth centers, which are thicker (3 mm) than the surrounding cartilage (0.75 mm): the sphenodorsal zone, which stimulates the length and height of the nose, and the sphenospinal(basal), which is responsible for the development of the anterior nasal spine and the maxilla.<sup>17</sup> If the septal cartilage is completely destroyed, including both the sphenodorsal and the sphenospinal zones, the outcome after the puberty growth spurt can be an underdeveloped nose with severe saddling and retraction of the columella and a retroposition of the maxilla. This study presents the management and ensuing outcome of nasal septal hematoma/abscess among Nigerians. The etiologies, presentations, and processes leading to diagnosis and treatment were sequentially highlighted.

## Patients and methods

Consecutive patients presenting with nasal septal hematoma/abscess at the University of Nigeria Teaching Hospital (UNTH) Enugu over a 10-year period (2004–2014) were prospectively studied. All patients diagnosed with nasal septal hematoma/abscess and treated in the Otolaryngology Department of the hospital were included in the study. Most of the patients were referred directly to the clinic, while the remaining were recruited through the Accident and Emergency Department.

A detailed history was taken from each patient or caregiver, and examination, including anterior rhinoscopy, was done. The biodata, antecedent history, and side of the septum affected were all recorded. The affected nasal cavity/cavities was/were obstructed with a visible mass. The obstructing nasal mass did not change in size when topical vasoconstrictor xylometazoline hydrochloride (Otrivin®) was applied but fluctuated when probed. Needle aspiration was performed and suspicious aspirates like pus sent for

microscopy, culture, and sensitivity. All the patients were admitted and the hematoma/abscess evacuated by incision and drainage under general anesthesia. A vertical incision was made over the point of maximum fluctuance. The septal cavity was irrigated with 0.9% saline solution and Penrose drain inserted. Tight intranasal packing with Vaseline gauze impregnated with gentamicin cream was then applied and left in place for about 5 days to obviate re-accumulation and allow adequate commencement of healing.

Broad spectrum antibiotics were administered and adjusted with result of culture. Where appropriate external splint and taping were applied to prevent dorsal hematoma, reduce edema, and provide adequate protection to minimize the discomfort. The patients were discharged after 7–10 days and seen for follow-up after 4 weeks. Subsequently, they were seen every 2 months for 6 months, during which time, they were re-evaluated to detect any complications or deformities of the nose. They were thereafter expected to be seen every 3 months for another 6 months, a total of 1-year follow-up.

## Ethics

Approval for the study was obtained from the Medical and Health Research ethics committee of the hospital and written informed consent to participate in the study was signed by the patients, parents, or caregivers.

## Results

Fifty-three patients were studied (37 males and 16 females) ratio 2.3:1 (Table 1). The peak incidence was within the 10–18 years age group followed by 1–9 years age group (Table 2). The age range was from 5 years to 65 years with a mean of 23.10 years. The hematoma/abscess was bilateral in 46 cases, five in the right and two in the left side of the nasal septum (Table 3). Needle aspiration confirmed hematoma in 49 cases and abscess in four cases. The abscess occurred in adult patients aged 49 years, 53 years, 56 years, and 65 years, respectively. In all, 16 patients were adults aged  $\geq 18$  years. All the aspirates were sent for microscopy, culture, and sensitivity tests. Only two yielded a positive culture – *Staphylococcus aureus*. Trauma in some form was identified as an etiological factor in 35 (66.04%), with males, numbering 20 (57.14%), constituting the majority. There was

**Table 1** Sex of patients with nasal hematoma/abscess

Sex	Number of patients
Male	37
Female	16
Total	53

**Table 2** Age grouping of patients with septal hematoma/abscess

Age in years	Number of patients	%
1–9	14	26.5
10–18	23	43.4
19–27	4	7.5
28–36	3	5.7
37–45	3	5.7
46–54	4	7.5
55–63	1	1.9
64–72	1	1.9
Total	53	100.0

a positive history of boil (furuncle) in the nasal vestibule of the adults who had abscess. In particular, the oldest, aged 65 years, a female, had, in addition, a positive history of tobacco snuffing. Most cases (90.6%) had used some form of antibiotic self-medication prior to presentation. The remaining 14 cases (26.4%) could not be linked to any identified etiology. One was prompted to class them as imperceptible trauma or spontaneous. The cases of hematoma presented within 10 days of onset of symptoms, while those with abscess presented after more than 2 weeks of onset of their symptoms. All the patients presented with nasal obstruction as the predominant symptom. Other symptoms presented are shown in Table 4.

All the patients were successfully treated and discharged. Follow-up has been possible in all for the first 6 months, but in the subsequent periods, follow-up was possible only in 47 patients. The remaining six patients were lost to follow-up.

## Discussion

Across the world, the occurrence of nasal septal hematoma/abscess has been variable over the years.<sup>18–20</sup>

Nasal septal hematoma may arise after injury to the nose, but also spontaneously on rare occasions<sup>21</sup> It has also been posited that septal hematoma following nasal trauma is probably more common than generally acknowledged.<sup>22</sup> The findings in this study were similar (65.2% from trauma) to these.

A relatively small percentage of patients with nasal trauma will develop a septal hematoma.<sup>11</sup> While an association between fracture of the nasal bones and septal hematoma

**Table 3** Side of nasal septum affected by hematoma/abscess

Sides	Number of patients
Right	5
Left	2
Both	46
Total	53

**Table 4** Presenting symptoms in nasal septal hematoma/abscess

Symptom	Frequency	%
Nasal obstruction	53	100
Mouth breathing	50	94.3
Nasal growth	51	96.2
Pain in the nose	27	50.9
Headache	3	5.7

has been reported in 15% of cases,<sup>6</sup> only two cases out of 241 children with nasal injury studies were associated with fracture of the nasal bones in another.<sup>18</sup> In the said study, only 25 (10.3%) of them developed hematoma or septal abscess. Grymer et al<sup>23</sup> found no case of nasal septal hematoma in 57 children between 0 years and 10 years with nasal fractures.

Variation as can be seen in the findings of various authors on nasal injuries and septal hematoma/abscess, it calls for caution and meticulous handling of patients to promptly identify and treat those with septal hematoma. History and thorough examination are paramount.

The most common symptom of septal hematoma/abscess in our study was nasal obstruction, found in all the patients. Other studies reported similar findings.<sup>3,6,8,19,23–25</sup> An examination suggestive of a septal hematoma will show asymmetry of the septum with a bluish or reddish hue over the mucosa. This was apparent in almost all our cases with the background of trauma. Only a complete intranasal examination in all cases of nasal trauma will detect intranasal fractures, dislocations, lacerations, hematomas, and abscess formation. An intranasal examination with anterior rhinoscopy is the crucial step for diagnosis. The recognition/diagnosis of a septal collection may be enhanced by application of topical anesthetic and vasoconstrictor, followed by palpation of the swelling with blunt instrument like cotton-tipped probe or applicator. Needle aspiration, as was done in our cases, will confirm the diagnosis, relieve pressure, and provide a specimen for microbiologic examination before definite drainage and nasal packing. Routine preoperative needle aspiration has been suggested by Ambrus et al<sup>3</sup> who hypothesized that in nasal septal abscess needle aspiration before drainage will reduce the pressure and may decrease the spread of infection in the intracranial area. However, the use of fine needle aspiration has been contested. Alvarez et al<sup>26</sup> noted that fine needle aspiration is not practical, and is not cost effective. Barrs and Kern<sup>27</sup> reported 50% of 100 children who were evaluated in an emergency department after sustaining nasal trauma had a radiograph of the nose, but intranasal examination was performed in only 20 children. The value or yield of radiographs in these situations is doubtful. Fractures of the cartilage do

not appear on a radiograph. In fact, nasal radiographic views rarely aid in the diagnosis or management of even bony fractures. Hence, a normal X-ray report should never be used as a substitute for an exacting examination.<sup>28</sup>

In cases of nasal septal hematoma, no computed tomography (CT) scanning is required. However, in the cases of septal abscess, CT scan will be necessary to rule out complications such as intracranial extension. The use of CT scan has been suggested when there is extensive facial and/or periorbital cellulitis, evidence of meningism, altered conscious state or localizing neurological signs, significant headache, failure to improve clinically following drainage of a nasal septal abscess, an extensive time delay in diagnosis, and isolation of an unusual organism.<sup>29</sup> There are certain other situations in which CT scan is highly indicated. These include situations in which the underlying etiology is unclear, suspicion of Wegener's granulomatosis, TB, syphilis, sarcoma, or lymphoma, particularly in spontaneous cases of immunocompromised patients, and in the presence of complications or lack of response to medical and surgical treatment,<sup>30</sup> no radiologic studies were done in our patients. Our diagnosis depended on the history, nasal examination, and needle aspiration, and no extension of infection was observed in our patients.

Only two cases in this study yielded positive culture results (*S. aureus*). These two were from the four confirmed cases of septal abscess. All the hematomas and the two remaining abscesses were sterile, the reason for this was not very clear. Antibiotic exposure prior to the presentation, especially in the abscesses could be adduced. In a consecutive series of 20 children admitted for treatment of hematoma and abscess of nasal septum, an organism was cultured in only one case of septal hematoma and was associated with the presence of cartilage destruction.<sup>6</sup> *S. aureus* was the most common organism grown. In Owerri Nigeria, Chukuezi<sup>8</sup> reported similar organism yield in cultures on abscesses, while the rest were sterile. In another study<sup>26</sup> where 16 pediatric patients with septal hematoma and/or abscess were treated, only two cases yielded growths (*S. aureus*), while yet another study<sup>31</sup> found and stated that the results of the cultures were not satisfactory; only one culture was positive for *S. aureus* in the nasal septal abscess group.

Nasal deformity, intracranial complications, and/or fatality were not recorded in our study. This result varied with the findings at Benin City in 1986<sup>32</sup> and Owerri Nigeria in 1992.<sup>8</sup> Ogisi found that four (40%) of ten consecutive patients followed up with spontaneous septal abscess had septal deformity. Chukuezi, in his series, noted that eight of 46 patients developed a septal abscess, four (50%) had

nasal deformities. The incidence of nasal septal deformity in this study (0.0%) and the other two at Benin (40.0%) and Owerri (8.7%) presents an interesting pattern and were strikingly low. While Chukuezi agreed with Ogisi's suggestion that deformity could be due to the delay in presentation and delay in surgical drainage of the abscess, one is inclined to subscribe to the fact that resistance to deformity is a factor of morphology, and nasal architecture is a major factor. It has been observed and speculated that complications of deformity following nasal septal hematoma in the white population were probably due to the more rapid resumption of the cartilage.<sup>22,33</sup> The typical nose of a black person is like a bicycle seat, unlike the markedly pointed nose of Caucasians. Whether racial factor or morphology plays a role would be settled with a randomized controlled or systematic study.

In this study, 26.4% was classed as spontaneous with 65.2% attributed to trauma. It is not surprising as spontaneous occurrence of nasal septal abscess has been documented in both immunocompromised and immunocompetent patients.<sup>34-37</sup>

Males outnumbered females (M:F =2.3:I) in this study; with Chukuezi<sup>8</sup> and Ogisi<sup>32</sup> all from the black population making similar observations; M:F =8:1 and M:F =4:1, respectively. Other literature suggests a strong male predominance in hematomas and abscesses of the nasal septum.<sup>6</sup> While the reason for this observation is not yet settled, it has been proposed that males are more commonly engaged in aggressive activities, violence, and road traffic accidents than females, which puts them at greater risk for development of nasal septal hematoma/abscess with a male to female ratio ranging from 2:1 to 8:1.<sup>3,6,8,19,20,25,32</sup>

The outcome of this study was strikingly favorable, with no recurrence. This was attributed to diligent packing of the nasal cavity with insertion of a drain that was left in place for a reasonable period of time to avoid re-accumulation of hematoma or abscess. Early presentation, prompt diagnosis, and treatment cannot be overemphasized as key factors for successful outcome. The insertion of drain and retention for a certain period have been shown as a very important factor in complete resolution of abscesses.<sup>38</sup>

## Conclusion

Nasal septal hematoma/abscess is more commonly encountered in children than in adults. Trauma is the most frequent etiology and males are more affected than females. Early presentation, prompt diagnosis, and treatment provide a desired result. Incision and drainage, and intranasal packing, with insertion of drain, is an effective treatment modality.

A high index of suspicion, and vigilant examination of patients presenting with facial trauma or nasal obstruction would lead to early detection of septal hematoma/abscess and consequent prevention of functional, aesthetic, and life-threatening intracranial complications.

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## Disclosure

The authors declare no conflict of interest, personal or institutional in this study.

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