Original Research Article

DOI: http://dx.doi.org/10.18203/issn.2454-5929.ijohns20180715

Rhinolith a forgotten entity: our experience in remote hilly population of Uttarakhand

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Received: 27 November 2017 Revised: 07 January 2018 Accepted: 09 January 2018

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ABSTRACT

Background: Rhinoliths are mineralized foreign bodies in the nasal cavity and are diagnosed based on the presenting illness and clinical examination. Giant nasal stones are very rare in occurrence, since improved diagnostic techniques now make it possible to identify foreign bodies at an early stage of disease. The aim of the study was to revisit this rare and forgotten clinical entity with the variations in presentation in the hilly population of uttarakhand and treatment revisited.

Methods: We report a case series of 33 patients with rhinoliths who presented to our institute over a period of 10 years, from January 2007 to January 2017.

Results: Average age was 25.48 years (range: 5 years to 60 years). 19 were female and 14 male. The incident was reported by a family member/attendant in 12.1% of cases (4 cases), discovered following nasal symptoms in 84.84% (28 cases) and was incidentally discovered in 3.03% (1 case). Symptoms comprised rhinorrhea associated with unpleasant nasal odor in 30.3% of cases (10 cases), epistaxis in 15.1% (5 cases), symptoms of sinusitis in 18.12% (6 cases), ozena in 6% (2 cases) and nasal obstruction in 84.84% (28 cases). There was one case of massive bilateral rhinolith presenting with bilateral symptoms which required an open approach in today's era whereas all other cases were managed endoscopically.

Conclusions: Although rhinoliths are a rare occurrence, attending doctors should be aware of this entity and should have a high index of suspicion in cases with progressive unilateral nasal obstruction, unilateral rhinorrhea, unilateral nasal bleeding. In rare cases, rhinolith should be kept in mind as a differential diagnosis and also in bilateral nasal symptoms also specially if the symptoms are long standing.

Keywords: Rhinolith, Calculi, Foreign body

INTRODUCTION

Rhinoliths are uncommon. They are calcareous concretions, formed by the deposition of salts on an intranasal foreign body. They usually have a laminated structure, suggestive of a pathophysiological mechanism that involves layers of mucin aggregating around the foreign body or nidus. Each mucin layer subsequently become calcified, perhaps aided by the presence of Rhinoliths turbulent air currents. are asymptomatic; as they progress they can develop into a symptomatic destructive entity with symptoms including nasal obstruction, purulent nasal discharge, rhinosinusitis, dacryocystitis and septal perforation, hence early diagnosis is mandatory to avoid complications.² We share our experience with this rare entity in the population of Uttarakhand.

METHODS

A prospective study was performed between January 2007 to January 2017 in the ENT department. It included 33 cases of rhinoliths, who presented to ENT OPD. Study variables comprised gender (Table 1), age (Table 2), symptoms (Table 3), means of extraction (Table 4), suspected nidus (Table 5) and approximate duration of symptoms (Table 6).

Patients presented with symptoms of fetid nasal/postnasal discharge, nasal obstruction, unilateral headache, unpleasant smell, ozena, recurrent epistaxsis and symptoms of maxillary sinusitis (Table 3). In one patient who had come with head injury, it was a chance discovery on head CT. Two patients were mentally retarded and had no complaints but nasal discharge and features of vestibulitis were noticed by attendants and caretakers. One patient presented with epiphora and was later discovered to have a giant rhinolith, compressing the naso-lacrimal duct.

Patients who had come with foresaid complaints were subjected to anterior rhinoscopy, followed by nasal endoscopy (Figure 1) with probing of the mass in nasal cavity, and X-ray PNS/CT nose and PNS was done (Figure 2, 3, 5). All patients were taken up for removal under general anaesthesia in OT and after removal, anterior nasal packing was done in 32 cases. Endoscopic removal of the rhinolith was accomplished in all except one (Table 4), in which the rhinolith was completely filling the nasal cavity and ethmoid sinuses- measuring approximately 6.2 cm by 4.5 cm. The ethmoid bony trabeculae and posterior cartilaginous and bony nasal septum were not visualized. There was also non visualization of central hard palate- due to erosion. In this particular case, lateral rhinotomy had to be done after a failed attempt of endoscopic extraction, and the rhinolith was removed (Figure 1-4).

Patients were kept in the hospital for observation after removal of pack for two to three days depending upon post op complaints. All were given intravenous antibiotics for 48 hours, and analgesics before pack removal. Saline nasal drops were added after removal of nasal pack, which was done 12 hours after the surgery. In the patient with lateral rhinotomy, suture removal was done at 6th postoperative day.

Patient were called for follow up at the first week postop, third week post-op and third month post-op when nasal endoscopy was done under local anaesthesia in 31 patients and under sedation in the 2 mentally retarded patients. Crusts, if any, were removed and general condition of nasal mucosa was inspected. Follow up was uneventful in all except four patients including one with the giant rhinolith, who developed atrophic rhinitis in post op period which was managed with nasal douching, 25% glucose in glycerine nasal drops and repeated nasal endoscopies with crust removal. Two had septal perforations.

RESULTS

A total of 33 patients with rhinoliths presented to ENT OPD during the study period of ten years, i.e. from January 2007 to January 2017. Average age was 25.48 years (range: 5 years to 60 years). Table 2 shows distribution by age group. 19 were female and 14 male cases, represented in Table 1. The incident was reported by a family member/attendant in 12.1% of cases (4 cases), discovered following nasal symptoms in 84.84% (28 cases) and was incidentally discovered in 3.03% (1 case). Symptoms comprised rhinorrhea associated with unpleasant nasal odor in 30.3% of cases (10 cases). symptoms of sinusitis in 18.12% (6 cases), epistaxis in 15.1% (5 cases), ozena in 6% (2 cases) and nasal obstruction in 84.84% (28 cases) (Table 3). There were 2 cases of mentally retarded adults brought to OPD when attendants noticed unilateral discharge from nose, with patients having no complaints, 2 cases of children where mother had noticed nasal discharge with patient not being aware of any symptoms and 1 case of incidental discovery of rhinolith when a patient sustained a minor head injury and a CT head was done for the same. The rhinolith was usually found in the antero-inferior part of the cavity, trapped by the inferior turbinate and on nasal floor (Figure 5 and 6). More rarely, it was found more posteriorly when it was bigger. In one case it was found occupying whole of the nasal cavity, pushing the septum to the opposite side and causing palatal erosion as well as compression of naso lacrimal duct. There was also erosion of the septum in two cases possibly due to long term pressure necrosis.

Table 1: Gender distribution.

Gender	Number of cases
Male patient	14
Female patient	19

Table 2: Age distribution.

Age distribution	Number of cases
0 to 10 years	6
11 to 20 years	8
21 to30 years	8
31 to 40 years	5
41 to 50 years	5
51 to 60 years	1

Table 3: Clinical presentation of patients.

Symptoms	Number of cases
Rhinorrhea	10
Epistaxis	5
Sinusitis Symptoms	6
Ozena	2
Nasal Obstruction	28
No Compaints	2

Table 4: Mode of removal of rhinolith.

Endoscopic removal	32
Lateral rhinotomy approach	1

Table 5: Suspected nidus for rhinolith.

Suspected Nidus	Number of cases
Seeds	11
Stones	9
Gauze pack	2
Insects	2
Sugarcane stick	1
Gelfoam	1
Unknown	7

Table 6: Approximate duration of symptoms.

Time duration	Number of cases
Less than 1 year	11
1 to 2 years	4
2 to 3 years	4
3 years and more	3
Time duration unknown	11



Figure 1: Pre-operative appearance of rhinolith on nasal endoscopy.



Figure 2: Pre-operative CT scan PNS: coronal image of a giant rhinolith.

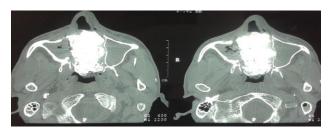


Figure 3: Pre-operative CT scan PNS: axial image of a giant rhinolith.



Figure 4: Removed rhinolith specimen.



Figure 5: Pre-operative CT scan PNS showing small rhinolith in nasal cavity.



Figure 6: Removed forgotten gauze strip in a rhinolith.

DISCUSSION

Rhinoliths also called as nasal calculi are calcareous concretions that arise secondarily to the complete or partial encrustation of intranasal foreign body. Rhinoliths were first described by Bartholini in 1654, as a stone hard foreign body that has grown around a cherry stone and then by Polson in 1943. They are actually rarely reported.

This is an uncommon entity and occurs as hard object in nasal cavity produced as a result of chronic inflammatory reaction due to a foreign body which acts as a nidus upon which mineral salts are deposited, they are classified as endogenous when they form around normal body material, such as blood clots, misplaced tooth remnants or bony sequestra. Exogenous rhinolith form around foreign bodies inserted into the nose usually of non human materials.^{4,5}

Rhinoliths are usually found on nasal floor and are unilateral. Kharoubi reported an unusual case of bilateral rhinolith. Rhinoliths are more or less spherical or irregular in shape and appear gray or brown in colour. Rhinoliths are usually unilateral but we encountered a case where the rhinolith was present in both nostrils due to erosion of nasal septum, because of large size and long standing history involving the entire nasal cavity with erosion of surrounding structures and it was grayish black in colour.

Typical presenting symptoms are unilateral nasal obstruction, purulent nasal discharge, malodour and epistaxis, but crusting, localized pain, chronic headache, anosmia and swelling of nose and face have also been documented. Time is a major factor in development of both rhinolith and its associated symptoms. With increasing time complications can occur which are sinusitis, septal perforation, palatal perforation, fistulous tract and recurrent dacryocystitis. All cases had unilateral symptoms except one patient however presented with bilateral nasal symptoms and bilateral epiphora due to the large size of rhinolith and erosion of surrounding structures causing septal perforation and bilateral dacryocystitis.

Diagnosis is made by keeping a high index of suspicion based on history of foreign body ingress, symptoms, clinical examination, nasal endoscopy and radiological tests which include X-ray PNS or CT Scan PNS. CT Scan PNS plays an important role in exact localization, size, extent and any complications caused by rhinolith which inturn helps in deciding the surgical approach for removal. Direct imaging may not reveal rhinoliths. Hadi et al reported that they had performed direct imaging in two out of eight patients, but that rhinoliths had not shown up.9 In doubtful cases, they recommended computerized tomography, which reveals such masses clearly. Diagnosis is mostly clinical in such cases. In unusual presentation especially in the case of a massive rhinolith due to the bilateral nasal symptoms, with suspected erosion of surrounding structures a CT scan PNS was done so as to determine the size and importantly the assessment of palatal perforation, ersion of the septum and the possibility of a subsequent saddle nose deformity and the need for appropriate patient counselling.

Differential diagnosis include osteoma, calcified nasal polyps, odontoma, impacted teeth, dermoid, chondrosarcoma, osteosarcoma and tuberculous and syphilitic calcification. 7-9

Small rhinoliths are removed transnasally under endoscopic guidance. Larger lesions can either be

removed in piecemeal or approached directly using a lateral rhinotomy approach under general anaesthesia, as done in one case in our study.

CONCLUSION

Although rhinoliths are a rare occurance, attending doctors should be aware of this entity and should have a high index of suspicion in cases with progressive unilateral nasal obstruction, unilateral rhinorrhea, unilateral nasal bleeding. In such cases, rhinolith should be kept in mind as a differential diagnosis and also in bilateral nasal symptoms also specially if the symptoms are long standing.

CT scan is another important part of management as direct imaging may not reveal rhinoliths. It helps us find the exact location of the rhinolith and also helps us differentiate from odontoma, ossifying fibroma, osteoma, osteosarcoma, enchondroma and glioma which present with similar symptoms

Funding: No funding sources Conflict of interest: None declared

Ethical approval: The study was approved by the

Institutional Ethics Committee

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Cite this article as: Bansal C, Singh VP, Nautiyal D. Rhinolith a forgotten entity: our experience in remote hilly population of Uttarakhand. Int J Otorhinolaryngol Head Neck Surg 2018;4:508-11.