

Rhinolithiasis: A case series on an unusual clinical entity

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Abstract: Rhinolithiasis are uncommon disease of nasal cavity; resulting from precipitation of calcareous concretion around organic or inorganic nuclues. This study aimed to review a series of patients diagnosed with rhinolithiasis, focusing on the surgical treatment with a literature review of this rare and overlooked diagnosis. This was a retrospective study, conducted over 16 years (January 2006-June 2017) in our ENT department. Patients were evaluated in terms of socioeconomic condition, clinical presentation symptoms, endoscopic and imaging finding. Surgical technique was described. A total of 7 cases were identified. Patient age ranged from 14 to 57 years; 5 cases were female. 5 patients were living in low socioeconomic conditions. The diagnostic delay varied from 1 year to 7 years. Unilateral chronic purulent rhinorrhea and nasal obstruction were the main complaint symptom. Nasal endoscopic examination and sinus CT scan were used for diagnosis in all patients. Removal of rhinolthisis was performed under general anesthesia by transnasal approach in all patients. Mineralogic examination of rhinolith was carried out in one case. Rhinolithiasis are a rare occurrence, but they should be suspected in every patient with chronic unilateral fetid discharge and nasal obstruction.

Keywords: purulent nasal rhinorrhea; nasal foreign body; nasal endoscopy; rhinoliths

INTRODUCTION

Rhinolithiasis is considered as a rare condition in head and neck diseases, involving a mass located in the nasal cavity and resulting from precipitation of calcareous concretions around an organic or inorganic nucleus [1]. Its pathogenesis is still not completely understood. The patients with rhinolithiasis present commonly long term of unilateral purulent discharge and nasal obstruction with or without the history of foreign body insertion [2]. However, they can be asymptomatic and discovered accidentally on routine ENT or imaging examination. Nasal endoscopy is important for both diagnosis and treatment. They often require transnasal extraction under general anesthesia, with or without fragmentation of the rhinolith.

The purpose of this report is to review a serie of patients treated for rhinolithiasis in our ENT department, focusing on the surgical treatment with a literature review of this rare and overlooked diagnosis.

MATERIAL AND METHOD

Between January 2006 and June 2017, seven cases of rhinolithiasis were admitted in Ddepartment of otorhinlaryngology, Specialities Hospital of Rabat,

Morocco and reviewed retrospectively. After anamnesis, the patients were evaluated with respect to age, sex, history of foreign body insertion, side of nasal obstruction and associated symptoms such as purulent nasal discharge, nasal bleeding, and headache [Table 1]. All patients were examined with rigid nasal endoscope after application of local anesthesia with 5% naphazoline xylocaine and nasal aspiration.

Nasosinusal CT scan was performed in all cases to support the diagnostic, to identify the localization of the lesion, its extension and its relationship with the adjacent anatomical structure and to determine the associated nasal disease.

All our patients had total extraction of rhinolithiasis with the assistance of rigid nasal endoscopy under general anesthesia and via an anterior approach, combined or not with a posterior approach, using forceps and suction. Mineralogical examination of removed rhinoliths was performed only in one case.

In post operative period, oral antibiotic was prescribed for 8 days and saline irrigation were advised for 1 month at least.

RESULTS

A total of 7 patients including 2 children were treated in our hospital for rhinolithiasis (n=7). There were 5 female and 2 male. The mean age of patients was 32 years, ranging from 14 years to 57 years. Most of the patients (5 of 7 patients) were living in poor socioeconomic conditions. The diagnostic delay varied from 1 year to 7 years with mean of 3 years. All patients were unable to remember the exact moment of insertion of nasal foreign body.

The main symptoms in all patients had chronic purulent rhinorrhea and nasal obstruction. They were associated with intermittent epistaxis in 2 cases and craniofacial pain in 1 case. One patient complained from watery eye [table 1].

Nasal endoscopic examination revealed a grey-white, irregular, hard and unilateral mass with inflammatory mucosa, but in one case the mass was submucosal and the diagnostic was not evident (case n°4). The rhinoliths was located in the right side in 4 patients and in the left side in 3 patients [Figure 1].

Oral examination was normal in all patients; there wasn't any oral fistula.

In the CT scan, the high density masses were located in the floor of nasal cavity between inferior turbinate and nasal septum in all cases [Figure 2]. It ascertained the diagnosis in case n°4.

All cases were operated under general anesthesia and the rhinoliths were fully extracted using endoscopic nasal surgery through the anterior approach but in one case, it was pushed posteriorly and extracted in the oropharynx, because of the rhinolith's size [Figure 3].

The removed rhinolithiasis in the last case was analyzed by infrared spectrometry and showed the concretion of calcium and phosphate with no existence of foreign body.

Postoperatively, there were no complications and all patients became symptom free.

Table-1: Clinical characteristics of patients

N	Age sex	socioeconomic status	Signs and symptoms	Medical history duration	Side	Treatment
1	28 female	low	Nasal obstruction Purulent rhinorrhea	5 years	right	Extraction under general anesthesia
2	51 female	low	Nasal obstruction Purulent rhinorrhea Craniofacial pain Watery eyes	1 years	left	Extraction under general anesthesia
3	57 female	middle	Nasal obstruction Purulent rhinorrhea epistaxis	4years	right	Extraction under general anesthesia
4	14 female	low	Nasal obstruction	2years	right	Extraction under general anesthesia
5	15 male	low	Purulent rhinorrhea epistaxis	18 month	left	Extraction under general anesthesia
6	19 female	low	Nasal obstruction Purulent rhinorrhea	2 years	right	Extraction under general anesthesia
7	40 male	middle	Nasal obstruction Purulent rhinorrhea	7 years	right	Extraction under general anesthesia



Fig-1: Nasal endoscopic image of a grey white rhinolith located between the septum (side of suction probe) and inferior in the right nasal cavity

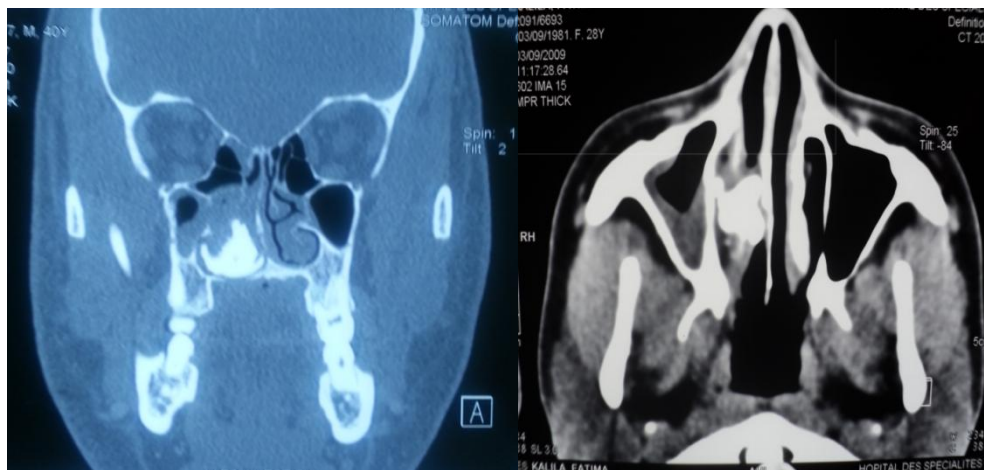


Fig-2: Coronal and axial sinonasal computed tomography (CT) shows a high-density, calcified mass located between the inferior turbinate and nasal septum in the left nasal cavity

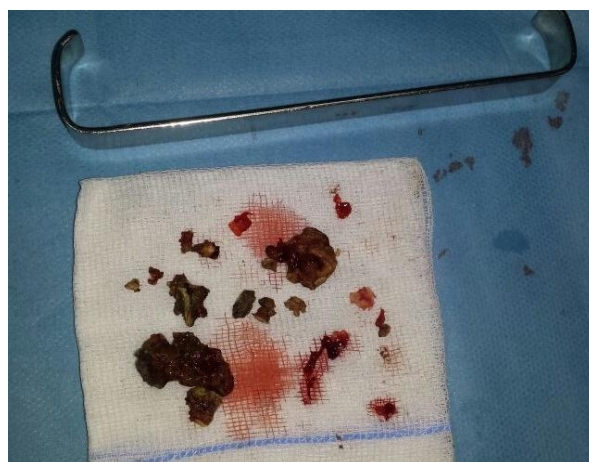


Fig-3: Macroscopic image of extracted rhinolithiasis

DISCUSSION

Rhinolithiasis is an uncommon entity of nasal cavity; since the first description by Bartholin in 1654, more than 700 cases were described in the literature [3].

They are more frequently seen in societies with low socioeconomic condition and they affect commonly young adult, but it could be seen at all ages [2]. Rhinoliths are often occurred in female patients [2,3].

This finding is consistent with our study. The reason for female predominance is unknown, but it could be explained by the narrowness of nasal cavity in women, additionally nose blowing and sneezing are both less forcefully and frequently in women than males, so they have less chances to expel nasal foreign body.

The exact pathogenesis and causes of rhinoliths is not yet completely understood [4]. It is thought that rhinoliths may originate from an endogenous nidus when they form around normal body material, such as blood clots, bone fragments, ectopic tooth, desquamated epithelium and dried nasal secretions or from an exogenous nidus when they form around foreign body such as buttons, fruit seeds, beads, pebbles, or gauze [5]. The nidus develops mostly in the nose in an antegrade way; however, it may also insert in a retrograde way because of vomiting, coughing, or sneezing [1]. The persistence of the nidus in the nose causes chronic inflammatory reaction and essentially leads to the deposition of calcium, magnesium phosphates, oxalates, and carbonates salts [4].

The rhinoliths formation period varies from a few months to several years [2,3]; Kermanshahi has described one case of rhinolithiasis in the nose that persists for more than 80 years [6]. In our series, the duration of medical history ranged from 1 year to 7 years.

Patients with rhinolithiasis present various and no specific symptoms leading to delayed diagnosis or misdiagnosis, but the most common presenting symptoms are unilateral chronic purulent rhinorrhea and nasal obstruction [2]. Other findings include epistaxis, headache, anosmia, facial pain [2-4]. In our study, one patient (case n°2) complained also from ophthalmic signs presented by watery eye.

However, rhinolithiasis may be asymptomatic and found incidentally on routine ENT examination, nasosinus CT scan, dental radiographic films or since septoplasty [2,4,7].

Endoscopic examination by rigid or flexible endoscope presents a great value for diagnosis; rhinoliths appear such as irregular, hard, dark gray mass rounded by granulation and inflammatory tissue. Palpations with the tip of suction facilitate diagnosis [2,3].

Rhinolithiasis is generally located at the floor of the nasal cavity, either between middle and inferior turbinate or between inferior turbinate and nasal septum [4]. Rhinoliths were located at the right side more than the left in our study, this is correlated with most previous reports [2,3].

Nasosinus CT scan has a high sensitivity and specificity to support the diagnosis and to detect the

associated nasal abnormality such as septal deviation, sinusitis, polyposis. The rhinolith appears typically such as an homogeneous high-density mass with irregular contours and the nidus may appear hypodense in the central part of the lesion [3,4].

Differential diagnosis that needs to be considered in such findings include ossifying fibroma, osteoma, hemangioma, enchondroma, calcified polyps, odontoma, and ectopic nasal teeth in the benign tumor; osteosarcoma, chondrosarcoma and squamous cell carcinoma in the malignant tumor; syphilis and tuberculosis in the inflammatory lesions [1].

It is a slow growing mass by disposition of calcium and magnesium salt and by increasing gradually its size it can cause destruction of surrounding structure and may cause septal perforation, destruction of medial wall of maxillary sinus with recurrent sinusitis, palatal perforation and oral fistula [8,9,10]. Other rare and serious complications were reported such as frontal osteomyelitis and epidural abscess by extension into cranium [10].

Removal of rhinolithiasis requires generally endoscopic approach under general anesthesia through the nose with or without fragmentation of rhinoliths [1,2]. Small rhinolith may be removed under local anesthesia [4]. If masses are voluminous, they can be pushed posteriorly in the nasopharynx and extracted transorally. In our study, one case was extracted by posterior approach. Turbinoplasty and submucosal resection can help for better exposure and suctioning with irrigation may facilitate the elimination of the smaller concretions. In the cases, extremely big rhinoliths can be extracted by Caldwell –Luc approach or lateral rhinotomy incision [1]. Bleeding after removal of rhinolithiasis requires packing or cauterization, and some authors proposed cauterization of granulation tissues formed around rhinoliths by silver nitrate to prevent mucosal synechia [2].

Several techniques were described for mineralogic examination of rhinoliths such as electron probe, x-ray diffraction analysis, and electron microscopic analysis [4].

The outcome is generally favorable; no case of recurrence was described.

CONCLUSION

Rhinolithiasis has a very low incidence in our medical practice; its pathogenesis is still not completely understood. Endoscopic nasal examination should be performed in every patient who had a long standing unilateral purulent rhinorrhea and nasal obstruction. Sinus CT is very useful for diagnosis, especially to evaluate the posterior extension of the rhinolith. The treatment of choice is surgical removal of the rhinolith

with the use of appropriate antibiotic therapy to control local infection.

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