CAS CLINIQUE / CASE REPORT

RHINOLITHS: AN UNUSUAL DIAGNOSIS OF NASAL OBSTRUCTION

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ABSTRACT : In our modern medical practice, rhinoliths are a rare occurrence, but they ought to be considered in the differential diagnosis of a long-standing nasal obstruction. They are known to cause unilateral nasal discharge, facial pain, headache, epistaxis, and nasal obstruction. We present two cases that we encountered in our practice, and discuss them with a review of the existing literature.

Keywords : rhinolithiasis ; nasal obstruction ; unilateral nasal discharge ; epistaxis ; oro-nasal fistula

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RÉSUMÉ : Dans notre pratique médicale actuelle, les rhinolithiases sont désormais rares, mais doivent toujours figurer dans le diagnostic différentiel d'obstruction nasale chronique. Elles sont responsables de rhinorrhée unilatérale, douleur de la face, céphalée, épistaxis et obstruction nasale. Nous présentons dans cet article deux cas rencontrés en clinique, et les discutons avec une revue de la littérature.

Mots-clés : rhinolithiase ; obstruction nasale ; rhinorrée unilatérale ; épistaxis ; fistule oro-nasale

INTRODUCTION

In our modern medical practice, rhinoliths are a rare occurrence. In normal situations, any tiny particles that may enter the nose during inspiration are eliminated through the secretion of mucus and ciliary action. If the mucosa is damaged, such particles may remain in the nasal cavity and grow in size through accretion of mineral salts and incrustation. As the rhinolith increases in size, the symptoms to which it gives rise may range from unilateral nasal discharge, unilateral purulent rhinitis with or without consecutive sinusitis, facial pain, headache, epistaxis and nasal obstruction.

The duration of the medical history may range from months to decades, and women appear to be more commonly affected than men [1]. Although most rhinoliths are detected in young adults, they may be found at any age (6 months to 86 years) [2]. The diagnosis is established on the basis of the medical history and endoscopic findings; an imaging modality may provide additional information.

CASE I

A 31-year-old male, overweight, nonalcoholic, nonsmoker, has consulted for a long-standing nasal obstruction. He works in a bank and recalls the presence of a bilateral nasal obstruction, which was predominant on the right side, and has persisted for the last 15 years. He complains of a purulent discharge from the right nostril accompanied by a foul smell without history of epistaxis, anosmia, facial pain or headache. Since then, he was treated with nasal steroids spray on multiple occasions without any improvement.

The patient reports that he fell once on his nose during adolescence (Figure 1) for which he did not need any medical care but does not remember introducing any foreign object in his nose during childhood. The patient has no history of a surgical act, no recent dental work, no exposure to wood splinters or other debris, and no other medical complaints.

On anterior rhinoscopy, no septal perforation was noted but a whitish solid mass was noticed occupying the right nasal cavity. This finding was also confirmed by nasal endoscopy (Figure 2).

FIGURE 1. Nasal scar

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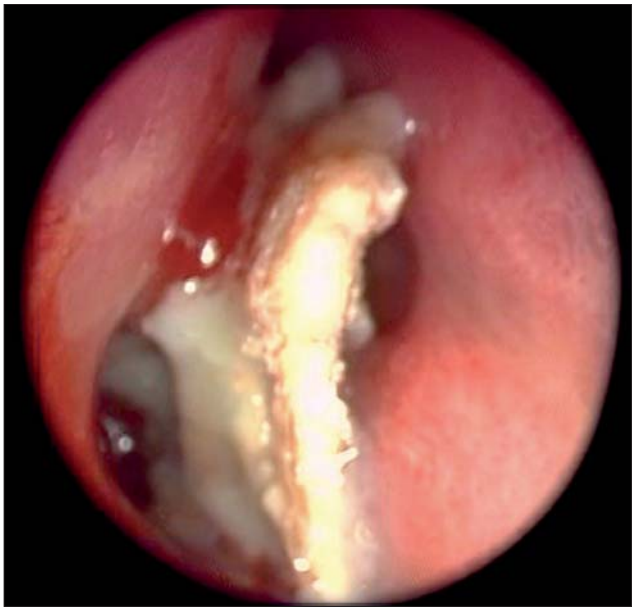

Figure 2. Rhinolith visualized by nasal endoscopy.

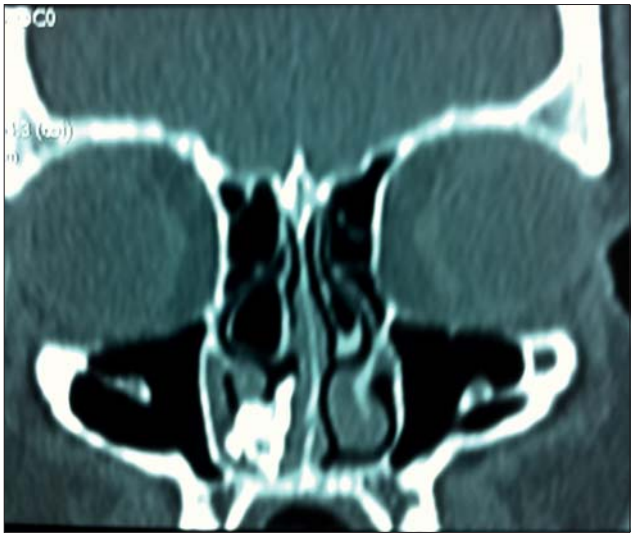

Figure 4. Coronal reconstruction of a CT scan showing the rhinolith in the right inferior nasal meatus in Case I.

The axial/coronal CT scan of the nasal cavity (Figures 3 & 4), obtained to elucidate the diagnosis, revealed a large, dense, space-consuming lesion under the inferior turbinate measuring 17 mm that the radiologist described as being an osseous or osteochondral mass. Continuity with or invasion of normal structures of the nasal cavity could not be ruled out.

Under general anesthesia, the rhinolith, which appeared as a calcified white mass, was broken up and extracted under direct visualization with a nasal endoscope. It was pushing the inferior turbinate upwards and encrusted in its mucosa and laying to the septal mucosa without any mucosal abnormality. It was extremely friable, and could be broken up with aspiration.

Histopathology examination revealed crystalline calcified deposits without any sign of malignancy.

Postoperatively, the patient became symptom free, and most notably was relieved by the disappearance of the foul smell. He was discharged the next day on painkiller and advised to use saline irrigation.

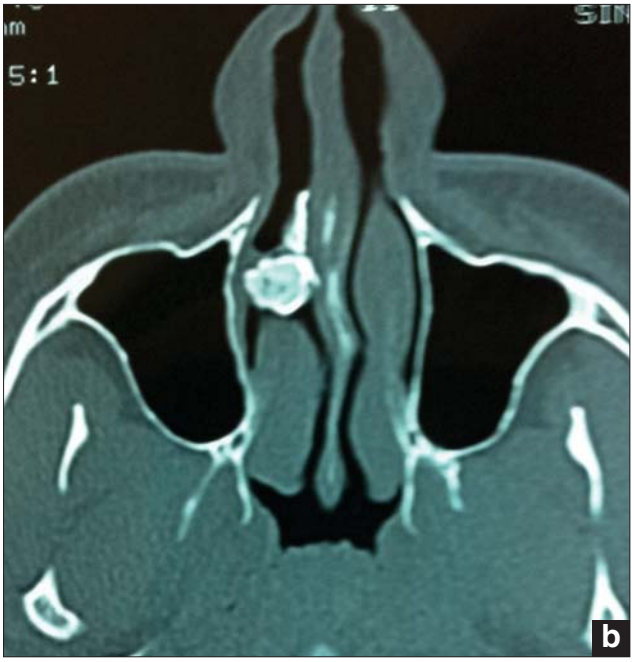

Figure 3. **a.** Axial CT of our first patient.
b. Enhancement showing the rhinolith with a hypodense core with no obstruction of flow of the maxillary sinus.

CASE II

A 20-year-old female, smoker, nonalcoholic, has consulted for unilateral mucopurulent discharge accompanied by headache and hyposmia for the last seven years. The discharge is notable for its fetid smell according to the patient, but there was no facial pain or epistaxis. She does not recall the introduction of a foreign object into the nasal cavity, but reports receiving a trauma to the nose in infancy.

The patient has no history of a surgical act, no recent dental work and no exposure to wood splinters or other debris.

On anterior rhinoscopy, there was a solid mass under the middle turbinate, pushing the inferior turbinate sideways. There was a septal deviation to the left but no septal perforation was noted. CT scan of the nasal cavity showed a 2.5 x 2 cm hyperdense lesion with hypodense core beneath the right middle turbinate (Figure 5).

Under general anesthesia, the rhinolith was broken up and removed with nasal endoscopy (Figure 6).

DISCUSSION

Rhinoliths are mineralized foreign bodies in the nasal cavity (and sometimes the maxillary sinus) [3-4] that are an incidental finding at anterior rhinoscopy. The foreign body finds its way into the nasal cavity almost always through the limen nasi. It is a deposition of calcareous salts around an endogenous (true rhinolith) or exogenous (false rhinolith) nidus. This foreign body may be endogenous such as a tooth, sequestrum, blood clot, and bone fragments or exogenous such as fruit seeds, beads, buttons, pebbles, or gauze tampon remains. This situation was formerly most commonly observed in children and the mentally retarded who insert such small objects into a nostril. Trauma, surgical operations and dental work, nasal packaging material, and plugs of ointment may also promote the development of a rhinolith.

Finally, a rhinolith may develop spontaneously in the case of a long-standing chronic polypoid sinusitis with accumulation of secretions followed by mineral deposition [1-2].

The first report of a rhinolith was by Bartholin in 1654, and the first antral rhinolith was described anonymously in 1686 [5-6]. Bartholin described a stone-hard foreign body that had grown around a cherry stone [7]. Since then until 1988, ≈ 600 cases were reported [8].

Most antral rhinoliths are endogenous and most nasal calculi are exogenous [9].

Rhinoliths are formed by the gradual deposition of calcium and magnesium phosphates, oxalates, and carbonates on a nucleus [10].

Time is a major factor in the development of a rhinolith [11]. Because they increase in size slowly and are relatively inert, rhinoliths initially cause no symptoms, but later they can cause nasal obstruction if they become large enough. They usually require two to five years to attain even a relatively small size.

Patients often complain about long-term unilateral nasal obstruction and smelly and bloody purulent rhinorrhea. Headaches, epistaxis, anosmia, cacosmia, epiphora, and/or swelling in the nose or face may also be seen.

The pathogenesis of rhinolith development has still not been completely elucidated. The following four conditions for the development of such a lesion are generally accepted and recognized:

1. The foreign body introduced into the nose must give rise to an acute or chronic inflammation of the nasal mucosa with consecutive suppuration.
2. The putrid discharge must have a high content of calcium and/or magnesium.
3. The mechanical obstruction must block the outflow of pus and mucus.
4. The secretion must be exposed to a current of air, to concentrate pus and mucus and permit the

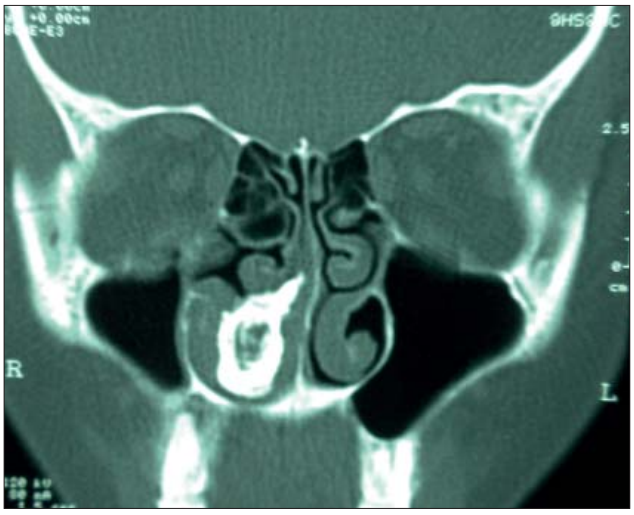

Figure 5. Coronal reconstruction of CT scan showing the rhinolith in the right inferior nasal meatus of our second patient.

Figure 6. Broken-up rhinolith removed from the nasal cavity under general anesthesia.

mineral salts to precipitate, and thus give rise to Incrustation (This condition explains the fact that such formations do not occur in the frontal and ethmoidal sinuses and rarely occur in the maxillary sinus).

They are usually unilateral and located in the lower portion of the nasal cavity. Kharoubi [11] reported an unusual case of bilateral rhinolithiasis subsequent to destruction of the posterior nasal septum.

The literature also contains an occasional absolute rarity, such as a living foreign body, for example, a live leech [12]. However, the literature also contains reports of rhinoliths that were only identified because of the severe complications they caused, such as perforation of the hard palate, bone destruction, expansion of the stone into the maxillary sinus, or septal perforation.

Whatever the presenting symptoms in cases of long-term nasal obstruction, a high index of suspicion of rhinolithiasis and full knowledge of the pathology should be maintained as they are the key to making the diagnosis [13].

Diagnosis of rhinoliths is established by palpation with rigid endoscopy.

CT scan is necessary for the diagnosis of rhinolithiasis. It has high sensitivity and specificity in the identification of calcification and the foreign body. The nidus may be observed as low density in the center of the lesion.

A rhinolith should be considered in a patient who has unilateral nasal obstruction with a foul-smelling discharge, regardless of whether sinusitis is also present. The differential diagnosis includes granuloma, syphilis, calcified polyps, benign tumors such as osteoma, ossifying fibroma, and enchondroma or malignantones such as chondrosarcoma, osteosarcoma, carcinoma, osteomyelitis, foreign body with calcium content (such as bone or tooth fragments), and chronic sinusitis.

In the first case described herein, an atrophy of the middle turbinate was seen. It is interesting to note that in both cases the core of the rhinolith could be seen on the CT scan (Figures 3-5) and that the location of the rhinolith in the inferior nasal meatus (Figures 4-5) is typical, and as detailed in this text, this location provides a mechanical obstruction to the outflow of pus and mucus. Another point of note is the aspect of the rhinolith under nasal endoscopy which is very calcified contrary to other rhinoliths described in the literature where some brownish and grey aspects are seen, and the rhinolith was brittle contrary to the cases seen in the literature where they were often hard. In our case, the rhinolith was secondary mostly to trauma but no foreign material was detected on pathological studies.

Consequences and complications of rhinolith comprise the following:

- Septal perforation
- Septal deviation
- Oronasal fistula
- Extension into maxillary sinus and cranium
- Atrophy of lower and middle turbinate
- Marjolin's ulcer [14].

Small rhinoliths are removed transnasally under local anesthesia, when necessary with microscopic/endoscopic assistance. Large lesions are first fragmented within the nasal cavity, and the pieces then removed under general anesthesia.

CONCLUSION

The presence of a rhinolith should be considered in every patient with unilateral nasal obstruction and foul-smelling nasal discharge, with or without sinusitis. The treatment involves the removal of the rhinolith and the use of appropriate antibiotic therapy to control local infection. Rigid nasal endoscopy is the most important method to be used in diagnosis and treatment.

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