Case report of a large rhinolith cast – A frequently missed diagnosis

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CASE REPORT

Case Report of a Large Rhinolith Cast – A Frequently Missed Diagnosis

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Abstract:
Background:
Rhinoliths are calcified or mineralized concretions that are deposited around a nucleus and are usually unilateral. They are rare with an estimated incidence of 1:10000 of all ENT outpatient cases. This may be an underestimation as many cases remain asymptomatic since the process may take years to develop.

Case Report:
We report a case of unilateral nasal obstruction since childhood in an adult male where the diagnosis remained obscured until thorough assessment was done. According to the anterior rhinoscopic and nasoendoscopic examination, there was an irregular bony mass occupying the left nasal cavity from the floor to the middle meatus. The diagnosis of rhinolith was confirmed by nasoendoscopy and non-contrast CT (NCCT) scan, and it was removed piecemeal from the nose.

Conclusion:
This case underlines the importance of a detailed clinical and endoscopic examination of the nose in adult cases with unilateral nasal obstruction. It also highlights the potential for misdiagnosis of such cases at the hands of general practitioners or physicians and the importance of early referral to an otolaryngologist in case of treatment failure by established protocols.

Keywords: Rhinolith, Nucleus, Exogenous, Endogenous, Encrustations, Unilateral, Nasal obstruction, Halitosis, Cacosmia, Nasoendoscopy, Surgical removal.

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with the following complaints:

- Halitosis for many years and stuffiness of nose bilaterally; it was felt more on the left side since childhood.
- Progressively increasing left side nasal block and snoring with postnasal discharge for 1 year.
- No recurrent sinusitis or upper respiratory infections, no apnea episodes, history suggestive of allergic rhinitis is present, no ear complaints.
- The past medical history is unremarkable. He had been diagnosed with a case of deviated nasal septum, sinusitis, and allergic rhinitis from various practitioners and used antiallergics with steroid nasal sprays. Occasionally used nasal decongestants without significant relief of his complaints.
- No history of foreign body insertion in the nose, and in spite of previous ENT consultations, was not aware of the rhinolith.

On examinations: Anterior rhinoscopy revealed deviated nasal septum to the left and inferior turbinate hypertrophy on the right side along with a yellowish-white, irregular, bony mass extending from the floor of the nose to the middle meatus. Throat examination showed moderate hypertrophy of tonsils and elongated uvula. Ears were unremarkable on both sides.

Nasoendoscopy showed a mass occupying the left nostril, the shape of which was like a cast from the floor of the nose to the middle meatus and appeared like a bony growth extending from the septum to the lateral wall of the nose (Fig. 1). The choana was free from this mass but showed another mass (lymphoid tissue) in the nasopharynx.

![Fig. (1). Endoscopic view of Rhinolith (R) extending from the septum (S) to inferior turbinate (IT) and covered with nasal secretions. Rhinolith extension to the floor of the nose (white R) is seen.](image1)

A clinical diagnosis of rhinolith was made and was confirmed by X-ray of paranasal sinuses (PNS) and NCCT scan of PNS (Figs. 2 and 3). The CT scan suggested a large rhinolith in the left nostril with a small area of radiolucency within the inferior part of the rhinolith suggesting a nucleus around which encrustation could have possibly happened (Figs. 2 and 3).

![Fig. (2). Coronal CT scan PNS showing Rhinolith (R) in the left nasal cavity extending to the floor of the nasal cavity. Note the radiolucent shadow in the middle of the rhinolith (arrow), possibly suggesting a FB nucleus around which encrustation of the rhinolith could have possibly taken place. Nasal Septum (S), Left Maxillary sinus (LM), Right Maxillary sinus (RM).](image2)

![Fig. (3). Sagittal view of the rhinolith (R) in the nasal cavity; note the bony floor (NF) being pushed down due to the rhinolith cast and radiolucent shadow in the middle of the rhinolith (arrow), possibly suggesting a FB nucleus around which encrustation of the rhinolith could have taken place.](image3)

The rhinolith was removed piecemeal by endoscopic surgery Figs. (4 and 5) under general anesthesia, and complete removal was confirmed by endoscopic re-examination of the nose on the OT table. The patient did not give consent for the biopsy or removal of the nasopharyngeal mass and wanted further treatment for the same if symptoms did not relieve after the rhinolith removal. The dimensions of the rhinolith were roughly 2.5 cm × 2.5 cm in antero-posterior and vertical length, and about 1 cm in horizontal and 3 cm in its maximum oblique length.
Fig. (4). Post-operative picture of the removed rhinolith. The arrow shows the fragment with possibly the nucleus of FB around which the rhinolith formed. This is the area of radiolucency seen in the CT scan pictures.

Fig. (5). Close-up view of the rhinolith fragment with a spherical well-defined and circumscribed possible FB nucleus (N) around which the rhinolith formed.

There was complete resolution of symptoms after 1.5 years of follow-up.

3. DISCUSSION

The first report of a calcified foreign body in the nose was by Bartholini in 1654 [3]. The term rhinolith was first used in 1845 [3]. Polson defined rhinoliths as partial or complete encrustations of intranasal foreign bodies by mineral salts precipitated onto them [3]. Rhinoliths have an incidence of 1 in 10,000 otolaryngology outpatients [1]. The usual range of age for diagnosis is between 8 to 25 years [14].

The causes and pathogenesis of rhinoliths are not fully understood. However, several predisposing factors may contribute, including the following:

- Lodgment of a nasal foreign body giving rise to an acute or chronic inflammation with subsequent suppuration.
- A high content of calcium or magnesium salts in the discharge.
- Presence of a blocked nose causing obstruction of nasal airflow, permitting precipitation of the mineral salts.
- Precipitation of these salts around the foreign body by a pus and mucus concentrate leading to encrustation [5, 6].

In all cases, they are predominantly inorganic with organic components mostly derived from nasal secretions [6 - 9]. We did not perform a mineralogical examination in view of the non-availability of this facility. The formation of rhinolith takes few years [10].

Rhinoliths, when small, are usually asymptomatic, but larger ones may cause unilateral nasal discharge, nasal pain, blocked nose, halitosis, epistaxis, nasal or facial swelling, or sinusitis; they may also remain asymptomatic [4 - 12]. Rhinoliths are always unilateral and rarely bilateral [13]. Macroscopically, they appear as irregular masses and feel hard, bony, or gritty on probing [14]. The differential diagnosis must include all possible lesions capable of blocking the nasal cavity and appearing as calcified masses on radiological tests, e.g., calcified nasal polyps, impacted teeth, and mycoliths. Other bony lesions like osteoma, osteosarcoma, ossifying fibroma, chondrosarcoma, along with syphilitic and tuberculous calcification, must also be considered [9, 15].

Diagnosis can be established by considering a high index of suspicion based on history, physical examination, and nasoendoscopy [12]. CT scan supports the diagnosis in addition to the planning of the surgical approach. CT scan has a high sensitivity in detecting even small amounts of calcification and provides information about surrounding structures while distinguishing rhinoliths from other entities [14].

Control of infection with appropriate antibiotics, surgical removal, and, if needed, local debridement is the treatment of choice [4]. Recurrence after removal has never been reported [4].

Symptoms like nasal block, halitosis, postnasal drip, and epistaxis are some of the most familiar complaints faced in routine practice by general practitioners, physicians, and otolaryngologists. There is a high potential for uncommon findings being missed and cases misdiagnosed, especially in rare diseases as may have happened in this case. The unwary physician may misdiagnose cases of similar symptoms and findings (unilateral nose block, halitosis) to be a simple case of the Deviated Nasal Septum (DNS) or foreign body nose or sinusitis. Attempts to treat it accordingly may lead to treatment failure and continued patient suffering. It is necessary for us, as physicians, to be aware of rare entities like rhinoliths in long-standing cases of unilateral nose block (when the suspected pathology might be benign) and suspect them especially if associated with halitosis, cacosmia, or epistaxis. Suspicion should be raised if findings like a bony projection or mass in the nose are associated with such symptoms.

Also, in case of treatment failure by general practitioners
and physicians, especially for diagnosed diseases with well-established treatment protocols (like sinusitis), a review of diagnosis and early referral to an otolaryngology specialist should be considered for detailed assessment and timely intervention to avoid continued patient suffering in such uncommon cases.

CONCLUSION

Although rarely encountered, attending general practitioners, physicians, and otolaryngologists should be aware of this entity. Knowledge of rhinoliths and a high degree of suspicion is necessary to accurately diagnose and treat them, especially when dealing with symptoms such as progressive unilateral nasal obstruction, rhinorrhea, cacosisia, or halitosis. Nasoendoscopy is an excellent tool for diagnosing rhinoliths followed by surgical removal or debridement with control of any infection for a successful outcome.

AUTHORS’ CONTRIBUTIONS

Irshad Mohiuddin clinically examined, diagnosed, investigated, and managed the case, along with performing surgery, preparing the manuscript, and reviewing the literature. Mayank Vats and Azmina Hussein were involved in the literature review and review of the manuscript. All authors read and approved the submitted manuscript.

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

Not applicable.

HUMAN AND ANIMAL RIGHTS

Not applicable.

CONSENT FOR PUBLICATION

Written informed consent was received from the patient.

STANDARDS OF REPORTING

CARE guidelines were followed.

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CONFLICT OF INTEREST

The authors declare no conflict of interest, financial or otherwise.

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