CASE REPORT

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Exogenous rhinolith: a case report

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ABSTRACT

Background: Rhinolith results from mineralized nasal foreign bodies. The time required for rhinolith formation is around 15 years and is usually diagnosed in the third decade of life. Most rhinoliths are asymptomatic or present with unspecific minimal symptoms. Symptoms of rhinolith include unilateral or bilateral foul nasal discharge, epistaxis, nasal obstruction, and halitosis. This case study aims to evaluate the recent management of exogenous rhinolith.

Case Presentation: We present a case of unilateral rhinolith in an 11 years old boy with a history of inserting eraser fragment into the left nostril at the age of 5. The patient complained of recurrent epistaxis with foul nasal discharge from the left nasal cavity. Rhinolith was extracted under general anesthesia. The extraction performed using raspatorium and headlight. The rhinolith was firmly attached to the floor of the nasal cavity but can be removed in toto. The specimen was sent to the Pathology Department for histopathological examination. The result showed respiratory epithelium covering edematous stroma with a proliferative vessel and lymphoplasmacytic inflammatory cell infiltration

Conclusion: Rhinolith is a rare condition with no or minimal symptoms. Management of rhinolith is extraction that can be performed under local or general anesthesia.

Keywords: Exogenous Rhinolith, Case Report, Management

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INTRODUCTION

Rhinolith is a mineralized foreign body within the nasal cavity.[1] Bartholini described the first cases of the mineralized nasal foreign bodies in 1654.[2] He reported masses as hard as rock grow enclosing a cherry seed.[2] The term rhinolith was used for the first time in 1854 to describe foreign bodies partly or fully enclosed by crust within the nasal cavity.[1-3]

Rhinolith can be classified as exogenous or endogenous based on the foreign body's origin that becomes the nidus.[3,4] Rhinolith's nidus originating from foreign bodies outside the patient's body, such as seeds, stones, cotton, parts of nasal tampon, and ointment, are classified as exogenous rhinolith.[4] While endogenous rhinolith, the nidus comes from the patient's body parts, such as bone fragments, blood clots, and mucus plug.[1-4]

The rhinolith prevalence is rare and often found incidentally on medical check-up or radiologic examinations for other purposes. It may occur at any age with predominance in young adults and is usually found in the third decade of life.[1-3] Based on those mentioned above, we present a case study of rhinolith in an 11-years old boy originating from an exogenous foreign body.

CASE DESCRIPTION

An 11 years old boy was referred with recurrent epistaxis on his left nostril for 4 years. Epistaxis occurred 4-5 times every week in a small volume and stopped spontaneously. The patient also complained of foul-smelling nasal discharge on the left nostril that doesn't respond to standard rhinitis treatment. The patient's mother recalled that her son inserted an eraser fragment into his nostril when he was 5 years old.

Anterior rhinoscopy reveals a blackish-brown mass covered with mucus on the anterior half of the floor of the left nasal cavity (Figure 1A). When the mass was probed using a cotton applicator, it was hard with a rough surface and bled easily. Bleeding was stop spontaneously. Another physical examination was unremarkable. CT scan examination was requested, which showed a 2 x 1.1 cm calcified mass within the left nasal cavity, and there were no signs of bone destruction (Figure 1B).

The patient was diagnosed with rhinolith on the left nasal cavity and planned for rhinolith extraction under general anesthesia because he was uncooperative. The extraction performed using raspatorium and headlight. The rhinolith was strongly attached to the floor of the nasal cavity but can be extracted in toto. The mass was 1.8 x 1 x 0.5 cm, blackish-red, hard, and covered with crust and mucus (Figure 2).

There was bleeding that was managed by anterior nasal packing. Nasal packing removed after two

days. Anterior rhinoscopy reveals good healing on the extraction site with no active bleeding. The patient was discharged with amoxicillin for 10 days and NaCl 0.9% nasal irrigation.

The specimen was sent to the Pathology Department for histopathological examination. The result showed respiratory epithelium covering edematous stroma with the proliferative vessel and lymphoplasmacytic inflammatory cell infiltration (Figure 3A and B). There was also a scattering of amorphous basophilic material with mineralized foci. It was concluded the mass was a foreign body with granulation tissue and mineralized foci.

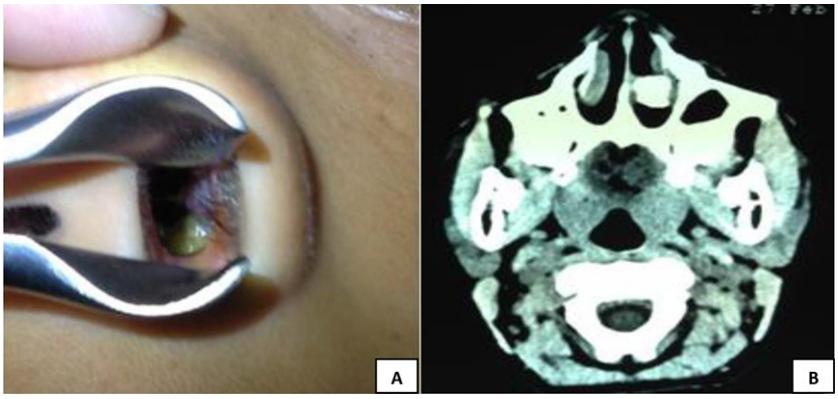

Figure 1. (A) Rhinolith in the left nasal cavity floor and (B) CT Scan reveal a calcified mass on the left nasal cavity

Figure 2. Extracted rhinolith in the patient

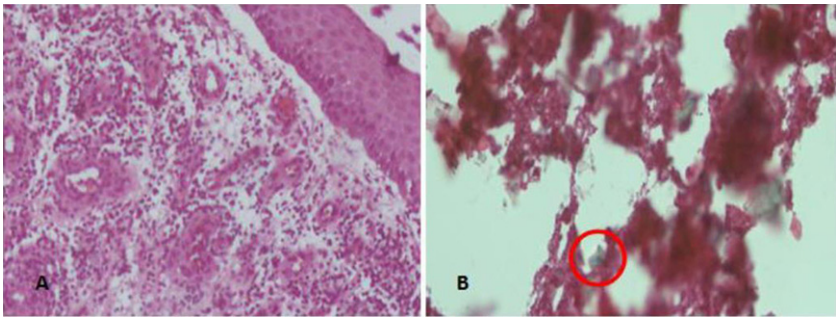

Figure 3. Histopathological examination reveals (A) respiratory epithelium with edematous stroma and inflammatory cells infiltration and (B) amorphous substances with mineralized foci (red circle).

DISCUSSION

Rhinolith is a rare condition that results from a mineralized foreign body in the nasal cavity.[5] The pathogenesis of rhinolith is unclear, but the presence of these four conditions for the formation of rhinolith is acceptable: 1) nasal foreign bodies, as nidus, causing acute and chronic inflammation with suppuration on the nasal mucosa, 2) high calcium and/or magnesium concentration in the suppurative secretion, 3) presence of mechanical obstruction that blocks the flow of the secretion, and 4) exposure of air current to the secretion that were causing concentration of secretion and mucus, deposition of mineral salts, and incrustation process to the nidus.[5]

Generally, rhinolith compositions are 90% inorganic material and 10% organic material.[6] Several known chemical compositions of rhinolith are hydroxyapatite, calcium orthophosphate hydrate, calcium, magnesium phosphate, carbonate, and oxalate ions. Glutamate and glycine are the organic compounds often found in rhinolith.[2,5,6] Oxalates tend to be deposited in an acid condition, leading to a hard rhinolith formation, while soft and friable rhinolith formed from the deposition of phosphates in alkaline conditions.[3]

The rhinolith is classified into exogenous and endogenous based on the nidus' origin (the nucleus of rhinolith). Exogenous rhinolith is formed by exogenous foreign bodies, such as seed, eraser, plastic material, and stones, while endogenous rhinolith originating from the patient's body parts, such as dried mucus/ blood clot, tooth fragment, and desquamated epithelium.[1-4] In this case, the nidus was thought to be an eraser, thus making it an exogenous rhinolith. This is in accordance with previous reports that most rhinoliths are exogenous.

The time needed to form a rhinolith is estimated at 15 years and is usually detected accidentally around the third decade. This patient was 11 when diagnosed with rhinolith. A previous study by Singh RK et al., and Aksakal C et al., reported 8 cases and 9 cases of rhinolith under 18 years old, respectively.[7,8] In this case, the early formation of rhinolith may be due to the hot climate where the patient stays. Hot weather might accelerate mineral deposition on nidus.

Most rhinolith cases can be asymptomatic or with minimal symptoms, thus often undiagnosed.[2] Most reported symptoms are chronic and unilateral

foul nasal discharge and nasal obstruction. Other symptoms include epistaxis, facial pain and edema, anosmia or cacosmia, epiphora, mouth breathing, headache, and halitosis.[2-4] Anterior rhinoscopy usually enough to evaluate rhinolith, but some cases require endoscopy. Rhinolith presents as a hard grey or brown mass covered by crust and has a rough surface. Some rhinolith may be brittle and break quickly on probing. The rhinolith location is usually in the nasal cavity's anterior half, between the septum and inferior turbinate.[1,2,4] Patient, in this case, complained of recurrent epistaxis and foul chronic nasal discharge from the left nasal cavity, without any nasal obstruction. Physical examination reveals rhinolith as a blackish-brown mass covered by crust in the anterior half of the nasal cavity, medial to inferior turbinate, and didn't cause total obstruction nasal cavity. It was hard with a rough surface and easily bled on probing.

Some rhinolith cases were reported accompanied by complications such as sinusitis, deviated nasal septum, septal perforation, and oronasal fistulae.[2,4,9] There were no complications in this case because the rhinolith size was relatively small, and it was diagnosed sooner than most patients with complications.

A radiologic examination is seldom required to diagnose rhinolith once seen during rhinoscopy, but rhinolith may be found accidentally during examination for other conditions, such as dental examination.[10] Plain x-ray and CT scan can be used to evaluate rhinolith if needed. On plain x-ray, rhinolith appears as a radio-opaque mass with lower density in the central part. Several projections required to assess the size and exact location of rhinolith.[11]

CT-scan can detail the size and location of rhinolith and complications to surrounding structures that may accompany it. Thus, more accurate management can be planned from CT scan examination. But, CT scan cannot differentiate rhinolith from other calcified mass.[11,12] Differential diagnosis of rhinolith includes calcified polyps, odontoma, calcified odontogenic cyst, osteoma, ossified fibroma, torus, granulation tissue, osteosarcoma, and other malignancies, impacted teeth, and the fragment of dental root.[2,4,11] CT scan was performed in this case and rhinolith appears as a calcified mass in the left nasal cavity.

Management of rhinolith is extraction that can be performed under local or general anesthesia, depend on the size, presence of complications, and patient's cooperativeness.[2,4,12] Most rhinoliths can be extracted intranasally using forceps or raspatorium. Some cases with a more prominent size or complications may require a more invasive procedure, such as Luc-Caldwell surgery or lateral rhinotomy.[1,2,4] Management of complications can be performed immediately after removal or separately as a two-stage procedure.[9,13]

Rhinolith extraction, in this case, was performed under general anesthesia using raspatorium and headlight intranasally. Removal under general anesthesia is more acceptable to the patient, especially children. Kinger and Kawatara[13] suggested rhinolith removal should not be performed under local anesthesia because its size and hard consistency may cause severe pain and massive epistaxis. The surgeon will also explore the extent of rhinolith and remove it altogether and minimize trauma to surrounding tissue.

Histopathologic examination is not routinely done, but it can differentiate rhinolith from neoplasm. Singh RK et al., reported rhinolith composed of degenerated material with calcium crystal, while Dib GC et al. reported it as chronic inflammation and granulation tissue.[7,14] In this case, histopathologic examination concluded rhinolith formed by amorphous foreign bodies covered by granulation tissue with mineralized foci.

Following surgery, the patient showed a good healing process. Recurrence of rhinolith is rare, Singh SK et al., reported one case with three times recurrence, and Doban M et al., reported a case of recurrent rhinolith after seven years of the first extraction.[7,15]

CONCLUSION

Rhinolith is a rare condition that results from mineralized nasal foreign bodies. This condition often undetected because it can be asymptomatic or unclear with minimal symptoms. Rhinolith is usually diagnosed in the third decade of life because it requires time to develop. The management is extraction that can be performed under local or general anesthesia. We reported unilateral rhinolith with a history of eraser nasal foreign body in an 11 years old child managed by extraction under general anesthesia. The rhinolith was extracted in toto with no complication.

CONFLICT OF INTEREST

There is no competing interest regarding the manuscript.

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AUTHORS CONTRIBUTION

All authors equally contribute to the study from the case selection, recent management to the case,

evaluating the outcome, until reporting the case study results through publication.

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