

Accidental Finding Prior to Rhinoplasty: Rhinolith- A Rare Case Report

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Key Clinical Message

Through this case report, we review a rare radiopacity finding within the nasal cavity and its histopathological findings in order to emphasize the importance of familiarizing oneself with all radiographic findings, regardless of their rarity.

Keywords: Rhinoplasty; Nasal Cavity; Nasal Obstruction; Rhinolith

Introduction

A rhinolith, also known as a nasal calculus, is a densely calcified mass, possibly formed around either external substances such as stones, batteries and plastic, or internal materials including dental epithelium and dried blood clots, within the nasal cavity (1-4). However, its exact etiology remains unknown (2). Typically, it is found either between the maxillary sinus wall and the inferior turbinate or between the nasal septum and inferior turbinate (1). Rhinoliths are generally single, unilateral and have an irregular shape (5). Various sizes and internal structures have been reported based on the nature of the rhinolith's core, including homogeneous or heterogeneous radiopacities (6). The occurrence of rhinoliths in the oral and maxillofacial structures is rare (1). However, they are more commonly observed in young adults, females, and individuals with a low socioeconomic status (2). Symptoms such as headache, anosmia, nasal obstruction, discharge, swelling, unpleasant nasal odor, halitosis, epistaxis, localized pain, and fever have been reported in approximately 1 out of 10,000 patients visiting ear, nose, and throat (ENT) specialists in relation to rhinoliths, which may persist for months or even years (4, 6). Although rhinoliths are often asymptomatic (7) and may be detected incidentally through routine radiographic imaging (5). Conventional radiographs are useful in differentiating rhinoliths from other lesions and detecting their location, especially in cases where the foreign body has high radiodensity (5, 7). However, computed tomography (CT) is more effective in localizing rhinoliths with lower radiodensity in the core (3).

In this case report, we present the incidental detection of a rhinolith through radiographic imaging in a 20-year-old patient who was a candidate for aesthetic rhinoplasty.

Case presentation

A 20-year-old female came to the outpatient department as a candidate for rhinoplasty. The patient's general medical history and the head and neck examinations were unremarkable. There were no complaints of nasal obstruction or discharge. On extraoral examination, there was no sensory disturbance and the face was symmetrical except for the nasal septum deviation. Cone beam computed tomography (CBCT) was prescribed to the septum deviation. The CBCT revealed an s-type deviation of the nasal septum, open ostia, and clear maxillary sinus cavity. Additionally, a solitary, densely heterogenic calcified mass measuring 9.3 mm in width, 14.4 mm in height, and 8.7 mm in anteroposterior size was noted in the right nasal fossa

between inferior turbinate and nasal septum. The mass was attached to the septum and the superomedial portion of inferior nasal concha and the inferomedial part of the middle nasal concha. The mass was well defined with mix, mostly opaque, and laminated internal view. (fig. 1)

Based on the radiographic findings, three differential diagnoses were rhinoliths, paranasal osteoma, and nasal foreign body.

The procedure entailed the removal of the lesion under general anesthesia. The lesion, which was attached to the perichondrium, was successfully excised using a nostril approach. Unilateral perforations on the mucosa of the septum and inferior and middle conchae, resulting from the lesion removal, were left unsutured due to their size, allowing them to heal through secondary intention. The excised lesion was sent for histopathological evaluation, and a routine septorhinoplasty was performed. For this purpose, a septal graft was harvested. However, the preserved L-strut proved inadequate in supporting the septal mucosa perforation due to its location and the amount of cartilage graft required. Turbinate outfracture or cauterization were not carried out, although turbinectomy was performed. An internal splint was applied as a routine measure, and follow-up sessions were scheduled for 1 week, 1 month, 3 months, and 6 months after the operation.

The histological examination revealed the presence of vascular respiratory epithelium, with subepithelial glands displaying a bland appearance and mild chronic inflammation. Calcified foreign body fragments were also identified. No atypical cells or conclusive evidence of malignancy were detected. The histological findings were consistent with a diagnosis of rhinolith. (fig.2)

The patient expressed satisfaction with the results and reported no nasal obstruction. Additionally, the patient noted improved breathing, despite having had no difficulties in breathing prior to the operation. No asymmetry was detected.

A CBCT scan was ordered 3 months post-surgery to validate the histopathologic outcomes and confirm the complete removal of the lesion. The CBCT evaluation confirmed the successful and complete excision of the lesion, thus supporting the rhinolith diagnosis. Synechia was found to be limited. (fig.3)

Discussion

Rhinoliths are uncommon findings, likely caused by the deposition of mineral salts around a nidus, such as a foreign body (8). A high level of suspicion is necessary, and differential causative factors, including osteoma, calcified nasal polyps, and ossifying fibroma should be considered to choose the best treatment approach (9). A variety of symptoms may be reported, depending on the localization and size of the lesion, such as unilateral nasal obstruction, epistaxis, headache, anosmia, epiphora, and purulent rhinorrhea (2, 9). However, rhinoliths can also be asymptomatic (6). Therefore, in cases with no symptoms, radiographic scans can lead to a diagnosis of rhinolith (4). A radiopaque lesion with lesser radiopacity in the center, located in either the nasal cavity or maxillary sinus, is a good predictor for rhinolith (5). However, rhinoliths may also appear as a homogeneous radiopaque view due to the presence of a radiopaque nidus (2).

In the present case, CBCT evaluations revealed a mixture of radiopaque and radiolucent radiographic findings. Furthermore, in the absence of any symptoms, a histopathological examination was conducted to establish a definitive diagnosis.

In cases where there is a coexistence of septal deviation and rhinoliths, the septum is typically deviated towards the opposite side of the rhinolith (2). This is likely due to the influence of the rhinolith on the cartilaginous septum during mass growth (2). This finding is consistent with our case.

Although previous studies have reported the concurrent performance of septoplasty or septorhinoplasty and removing rhinolith (2), the specific details of the septoplasty procedures used are unclear. In this case presentation, we have provided a detailed description of the septorhinoplasty procedure to assist surgeons in surgical planning.

The defects in the intranasal mucosal lining may be asymptomatic and do not require additional treatment procedures (10). However, the intranasal exposure of the spreader grafts may occur due to the presence of

a defect in the mucosa. Therefore, large defects may require covering the grafts using various techniques to protect them from intranasal exposure (11).

A variety of surgical interventions have been introduced to manage perforations of the septal mucosa in cases where the underlying septum is also perforated. These procedures are categorized into local flaps only or incorporation of interposition grafts (10). The local flap may be used unilaterally or bilaterally, unipedicled or bipedicled, and with an anterior or posterior base (12). The interposition graft can also be harvested from various sites including temporalis fascia, conchal cartilage, and tragal cartilage (10). In the present case, despite the absence of supporting septal cartilage, the unilateral perforation of septal mucoperichondrial tissue was left unsutured because of the intact contralateral mucoperichondrial tissue of the septum. Moreover, the internasal splint was used to prevent synechia following the unsutured perforation of the mucosa of the septum and inferior and middle conchae. Favorable outcomes revealed the secondary intention was successfully performed.

However, there is insufficient evidence regarding the critical limit of septal mucosa perforation that prevents synechiae and ensures secondary intention. This may also be influenced by many other factors, including the site of the perforation. Therefore, further researches should be conducted in this matter.

Based on the favorable outcomes and absence of complications, the introduced procedure may be useful for assisting surgeons in carrying out septorhinoplasty and successfully removing the rhinolith without concerns about synechia.

Conflict of interest statement

The authors have no conflict of interest to declare.

Consent

Written informed consent was obtained from the patient to publish this report in accordance with the journal's patient consent policy.

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Figure legends:

Fig.1: pre-operative CBCT. (a) sagittal view; (b) coronal aspect; (c) axial section.

Fig.2: histopathological micrograph. Note the fragments of calcified foreign bodies.

Fig.3: post-operative CBCT. (a) sagittal aspect; (b) coronal view; (c) axial section. Note the limited synechiae in comparison with pre-operative CBCT.



