

Rhinolith: An incidental radiographic finding

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ABSTRACT

Rhinoliths are foreign bodies composed of mineralised deposits in the nasal cavity that are rarely encountered in routine dental practice. The current report presents a case of a 77-year-old female patient who visited a dental treatment centre for a routine dental check-up and prophylaxis. On the clinical examination, the patient did not report any breathing difficulty, nasal obstruction, or any form of discharge. Panoramic radiography showed a horizontally magnified radiopaque structure in the right nasal fossa region. Cone-beam computed tomography (CBCT) revealed a hyperdense entity with a laminated presentation in the right nasal fossa. The hyperdense entity was diagnosed as a rhinolith based on the radiographic findings. Although the patient was asymptomatic, a referral was made to an ear, nose, and throat surgeon for a further evaluation. This report highlights the importance of CBCT imaging in the diagnosis of soft-tissue calcifications. (*Imaging Sci Dent 2021; 51: 333-6*)

KEY WORDS: Foreign Bodies; Nasal Cavity; Incidental Findings, Cone-Beam Computed Tomography

Rhinoliths are calcareous concretions that occur in the nose.¹ These soft tissue calcifications usually arise due to the deposition of mineral salts and are composed of various minerals, such as calcium phosphate, calcium carbonate, and magnesium, around the nidus.^{2,3} The nidus of a rhinolith is usually an exogenous foreign body (coins, beads, and so on), especially in the paediatric population. Generally, the route of entry of the foreign body is the anterior region of the nose. However, some bodies may enter the choana posteriorly during sneezing, coughing, or emesis.² Conversely, the nidus of a calcification in the antrum of the maxillary sinus, referred to as an antrolith, is usually endogenous, such as a root tip, bone fragment, blood clot, or inspissated mucus, especially in the adult population.^{4,5}

Rhinoliths occur in a variety of shapes and sizes and their internal structure may present as homogeneous or heterogeneous radiopacities with occasional laminations, depending on the nature of the nidus. The density occasionally

exceeds that of the surrounding bone.^{6,7}

Rhinolithiasis can be diagnosed by means of a radiographic evaluation or clinical visualization via nasal endoscopy. The treatment of this condition entails complete removal of the object under topical, local, or general anaesthesia. An untreated rhinolith may lead to several complications, including chronic sinusitis, septal perforation, naso-oral fistula, dacryocystitis, frontal osteomyelitis, and epidural abscess.^{6,8}

Rhinoliths are usually rare and are detected in 1 in every 10,000 patients who visit the outpatient units of ear, nose, and throat (ENT) specialist treatment centers.⁹ However, this prevalence could be an underestimation, as some patients are asymptomatic and do not seek treatment. Hence, the cases may never be reported.¹⁰ Some patients experience unilateral symptoms, including nasal obstruction, purulent nasal discharge, headaches, facial pain, epistaxis, and malodour. Some patients could recollect a history of nasal foreign body insertion, usually during childhood. Rhinoliths are typically located between the nasal septum and inferior turbinate.^{6,8} The current report presents a case of incidental detection of a rhinolith on a cone-beam computed tomography (CBCT) scan.

Received May 23, 2020; Revised April 28, 2021; Accepted May 12, 2021

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Imaging Science in Dentistry · pISSN 2233-7822 eISSN 2233-7830

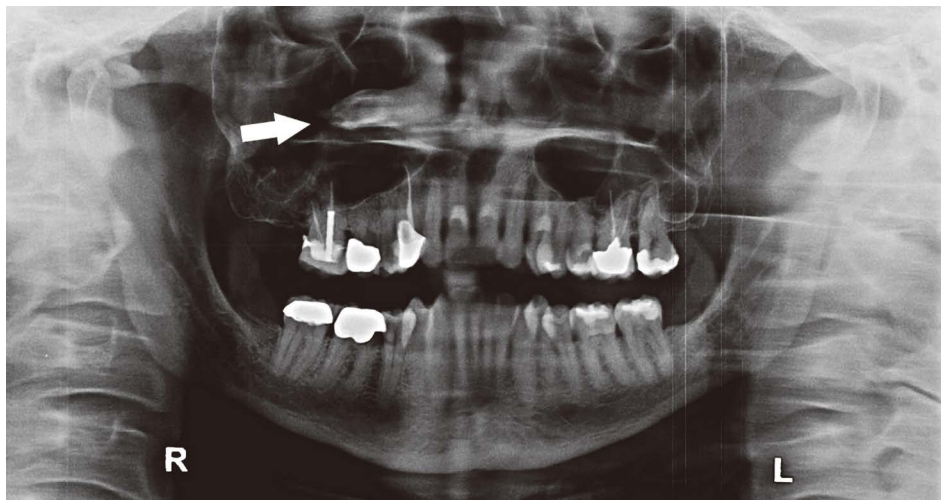


Fig. 1. Panoramic radiograph shows a radiopaque mass in the right upper area near the nasal fossa (white arrow).

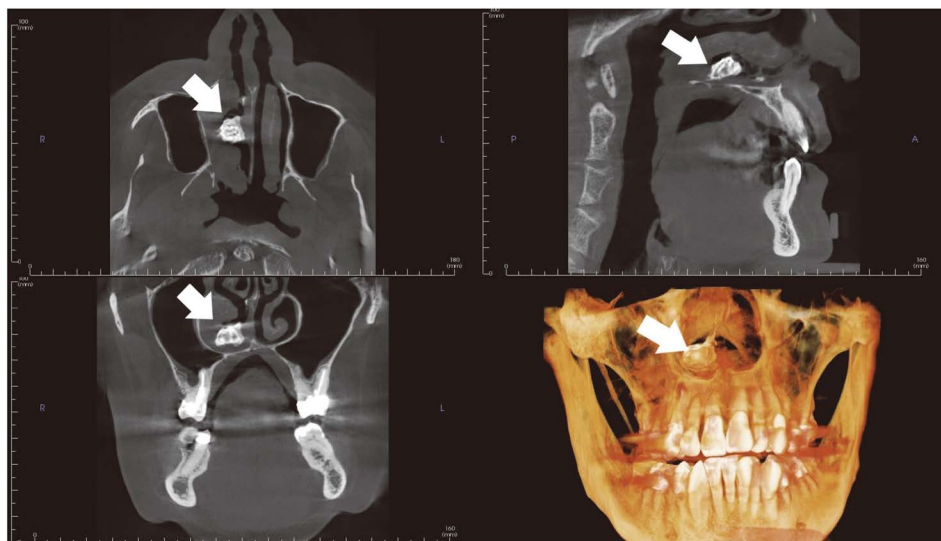


Fig. 2. Cone-beam computed tomographic axial, sagittal, and coronal and volume-rendered images show a hyperdense calcified foreign body in the upper right nasal fossa region.

Case Report

A 77-year-old female patient visited a treatment centre for a routine dental evaluation and oral prophylaxis. The patient was not on any specific medications aside from over-the-counter drugs, and she did not report any known allergies. The most recent medical intervention in this patient was performed approximately 30 years ago, and involved hospitalization and surgery; no complications were noted at the time. The patient did not report any discomfort, nasal obstruction, or pain. A general physical examination was performed and the results were observed to be within the normal limits. No significant medical, family, or psychosocial history was present. A panoramic radiograph was obtained as a part of the routine evaluation. Evaluation of the panoramic radiograph showed a radiopaque horizon-

tally magnified structure in the right nasal fossa region (Fig. 1, white arrow), reflecting the inherent limitations of panoramic radiographs. A CBCT scan was obtained and referred to an oral and maxillofacial radiologist for further evaluation. A board-certified oral and maxillofacial radiologist interpreted the volumetric evaluation. The scan revealed a large, well-defined, round (axial view), oblong (sagittal view), hyperdense entity with a laminated presentation in the right nasal fossa. The object measured approximately 10.04 mm (width) \times 8.72 mm (height) in its greatest dimensions (axial view). Additionally, a couple of smaller, hyperdense entities were observed (coronal view) at the level of the anterosuperior surface of the inferior turbinate (Fig. 2, white circle). In the axial view, the entity appeared to be attached to the nasal septum. Based on the radiographic findings, a diagnosis of benign soft tissue calcifica-

tion (rhinolith) was made. The recommendation provided to the patient included a referral to an oral/ENT surgeon for possible surgical removal of the rhinolith.

Discussion

The current case report presents the case of a 77-year-old female patient with a rhinolith that was diagnosed based on a CBCT scan. Rhinolithiasis is relatively rare and the diagnosis requires a high index of suspicion. A radiographic evaluation using a CBCT scan provides a 3-dimensional perspective and facilitates the localization and diagnosis of the condition.¹¹⁻¹³ Initially, detected calcified bodies were categorised as true or false rhinoliths. However, the current terminology is exogenous or endogenous, depending on the presence or absence of a nucleus within the incrustation.¹⁴

Rhinoliths are most frequently located between the inferior turbinate and nasal septum.⁸ A similar location was observed in our case. Other locations include the nasopharynx and the fossa of Rosenmüller.³ A previous study by Aksakal² regarding rhinoliths reported a female predominance, which is concurrent with the current report involving a female patient.

The aetiology of the development of rhinoliths remains ambiguous, and their formation could take up to 15 years. The literature shows that rhinoliths are more common in children.¹⁵ Considering the age of the present patient, it is fair to hypothesise that the formation of the rhinolith took a considerable amount of time. A previous case report by Brehmer and Riemann¹⁶ reported a case of a male patient with a history of stone insertion into the nasal cavity at the age of 5 or 6 years. Although the patient was asymptomatic for a considerable period of time, he presented with obstruction in the right nasal cavity and nasal discharge at the age of 37 years.¹⁶ A clinical examination after removal of the discharge revealed the presence of a black substance at the piriform aperture, which obstructed the right nasal cavity. The rhinolith was removed under general anaesthesia.¹⁶

Bader and Hiliopoulos¹⁷ reported a case of a female patient with a ball of cotton wool that entered the nasal cavity during irrigation of the maxillary sinus at the age of 10 years. The patient presented to an ENT treatment centre with impaired nasal breathing at the age of 30 years.¹⁶ However, no intervention was performed, as the evaluation did not yield any evidence of an anomaly. The patient experienced social problems due to the foul odour, and had not gotten married. The rhinolith was incidentally detected and removed when the patient presented to an ENT treat-

ment centre with hearing problems at the age of 71 years.¹⁷

Rhinoliths can display a wide spectrum of clinical features. If a rhinolith is not treated, it may lead to serious sequelae, although the rhinolith may be detected as an incidental finding in an asymptomatic patient.^{17,18} Some previous studies have reported symptomatic patients with features of unilateral chronic purulent rhinorrhoea and nasal obstruction.¹⁹ Other studies have reported symptoms such as nasal obstruction accompanied by facial pain and nasal discharge.¹⁴ Nevertheless, some patients with rhinoliths do not display any symptoms, such as the current patient, who was asymptomatic.¹⁸

The recommended treatment of rhinoliths is surgical removal under local anaesthesia.^{14,20} The removal of rhinoliths is usually successful without any recurrence.²¹ Our patient was advised to undergo surgical removal of the rhinolith and a referral to an ENT surgeon was provided for this purpose.

In conclusion, rhinoliths display a very wide spectrum of clinical presentations ranging from asymptomatic cases to situations involving purulent nasal discharge. Radiographic investigations can facilitate an accurate diagnosis and further evaluation, and a second opinion from an oral and maxillofacial radiologist would be beneficial in the diagnosis and treatment. This report highlights the importance of CBCT imaging in the diagnosis of soft-tissue calcifications.

Acknowledgements

The authors would like to thank Dr. Kathryn Apotsos for allowing this case report to be published.

Conflicts of Interest: None

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