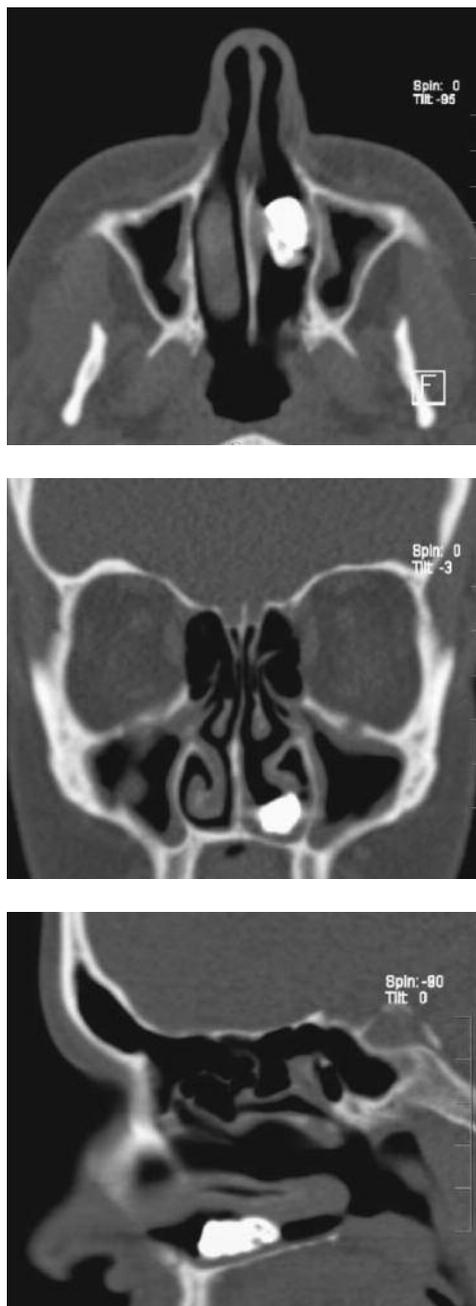


## RHINOLITH OF THE NASAL SEPTUM

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**Key-word:** Foreign bodies, in air and food passages

**Background:** A 42-year-old woman was referred to the department of Head and Neck Surgery, because of left sided nasal obstruction and foul smell. She underwent an endoscopic investigation of the nasal cavities, during which a brown-grayish mass was noted resting on the floor of the left nasal cavity.



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Fig.  $\frac{1}{2}$   
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## Work-up

Axial CT image of the nasal cavities and sinuses (Fig. 1) shows a dense radiopaque structure located centrally in the left nasal cavity.

On coronal MPR-image of the nasal cavities and the maxillary sinuses (Fig. 2), note the deformity of the concha nasalis inferior, which appears to be displaced upwards.

There is a slight deviation of the septum to the right side.

On sagittal MPR- image of the left nasal cavity and the left frontal and sphenoid sinuses (Fig. 3) it appears that the radiopaque structure is located about halfway between the anterior and posterior portion of the nares.

## Radiological diagnosis

The CT images suggest a *rhinolith* with associated subtle chronic inflammation of the maxillary sinuses. Endoscopic removal of the radio-opaque fragment revealed a small, metal screw.

## Discussion

A rhinolith is an uncommon finding, presenting as a hard, dense and usually irregular mass in the nasal cavity. It is most often found on the floor of the nose, halfway between the anterior and posterior portion of the nares. Very rarely, it arises in the frontal or maxillary sinuses. Males and females are equally affected and rhinoliths have been reported in all age groups, most often however in children.

Rhinoliths consist of calcareous encrustations of a nidus that can be endogenous or exogenous in nature.

Endogenous nuclei include dried blood clots or mucus, teeth and (post-traumatic or post-surgical) bony fragments.

Exogenous nuclei seem to be more common and include fruit seeds, beads, buttons, pebbles, cotton, or (as in the current case) a metal screw, usually inserted via the nostrils in childhood and then accidentally forgotten. Sneezing, coughing or vomiting, resulting in regurgitation of material into the nasal cavity, have also been reported as a cause. If present at all, symptoms can be purulent rhinorrhea, unilateral nasal obstruction, local pain, headache, fever, anosmia and odor (because of foul-smelling discharge). Cases have been reported

of rhinoliths causing secondary chronic sinusitis, erosion of the wall between the nasal cavity and the maxillary sinus, and perforation of the palate.

The pathogenesis remains unclear, but it is suggested that the foreign body incites an inflammatory reaction with deposition of mineral salts. Physical and chemical factors (pH changes, hypersaturation of secretions and enzymatic activities of bacteria) as well as mechanical factors (stasis of nasal secretions and tears and alterations of aerial flow) are thought to contribute to this process. Chemical analysis of the stones may reveal deposits of calcium phosphate and/or magnesium phosphates around a nucleus consisting of magnesium containing whitlockite, but stones consisting of siderite and ferrihydrite with a nucleus of high iron content have also been reported. In all cases the predominant material is anorganic, with organic components mostly deriving from nasal secretions.

Conventional radiography may reveal a radiopaque lesion with a central area of lesser opacity on the floor of the nasal cavity. Several projections taken from different angles to evaluate the precise size and location are often required. CT is the preferred imaging modality, because of its superior sensitivity and specificity for identifying calcifications and foreign bodies in a complex anatomical area such as the paranasal sinuses.

The differential diagnosis includes other disorders, such as calcified polyps, odontoma, osteoma, ossifying fibroma, tori, osteosarcoma, retained roots and impacted teeth.

Treatment consists usually of endoscopic removal under local anaesthesia. In rare cases of firmly adherent stones, an extended surgical approach is mandatory (lateral rhinotomy). When the rhinolith is very large, it can be crushed manually or by using a lithotripter.

## Bibliography

1. Barros C.A., Martins R.R., Silva J.B., et al.: Rhinolith: a radiographic finding in a dental clinic. *Oral Surg Oral Med Oral Pathol Oral Radiol Endod*, 2005, 100: 486-490.
2. Hadi U., Ghossaini S., Zaytoun G.: Rhinolithiasis: A forgotten entity. *Otolaryngol Head Neck Surg*, 2002, 126: 48-51.
3. Keck T., Liener K., Sträter J., et al.: Rhinolith of the nasal septum. *Int J Pediatr Otorhinolaryngol*, 2000, 53: 225-228.