

Paranasal sinus anatomy and inflammatory patterns

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Abstract

Computed tomography (CT) is regarded as the "gold standard" in imaging sinonasal disease. CT offers excellent delineation of bony anatomy and extent of disease and serves as a "road map" during functional endoscopic sinus surgery (FESS). CT should always be the preferred modality in sinonasal imaging. Magnetic resonance imaging (MRI) is supplementary to CT in case of neoplasm and complications to sinusitis, and usually should be performed after clinical evaluation by an ENT surgeon.

Correct CT imaging technique is important. In addition to bone algorithm with slice thickness ≤ 1 mm, soft tissue algorithm with slice thickness 2.5 mm may give useful information about sinus content as well as stranding of the peri-antral fat (antrum = maxillary sinus) as sign of invasive fungal sinusitis.

The report should include what the ENT surgeon wants to know. Start with development of the sinuses. Hypoplasia of the maxillary sinus is associated with lateralization of the uncinat process. The uncinat process is an important landmark during FESS, and in case of lateralization, the lamina papyracea and the orbit are exposed.

Other important pneumatization variants are asymmetry of the ethmoid roof, large concha bullosa, infraorbital, agger and sphenothmoidal cells.

Five chronic inflammatory patterns have been described. Infundibular, ostiomeatal and sphenothmoidal recess patterns are due to obstruction of mucociliary flow.

The fourth is polyposis and the fifth contains the rest.

Fungal sinusitis must be suspected if there are calcifications in the opacification.

Pyocoele and allergic fungal sinusitis have higher attenuations at soft tissue algorithm.

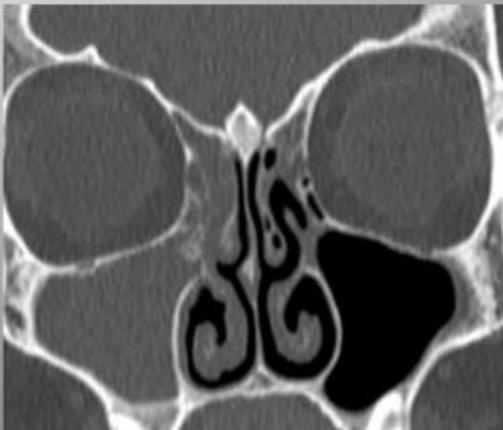
In case of unilateral disease, neoplasm must be ruled out. Always look for bone destruction.

Learning Objectives

1. To describe the sinonasal anatomy and the key anatomic structures predisposing to inflammatory disease
2. To review the imaging aspect of common and less common inflammatory patterns
3. To highlight potential pitfalls and how to avoid misdiagnosing neoplastic disease as inflammatory lesions
4. To present a systematic approach for a clinically relevant radiologic report

Teaser

Unilateral opacification
Rhinosinusitis? Acute or chronic condition? Cause?



Test Your Knowledge

1. The ethmoid infundibulum is the common drainage pathway for the ostiomeatal complex.
 - a. True
 - b. False
2. Peripheral calcification of a cystic structure in the bottom of the maxillary sinus is most likely to be an odontogenic cyst.
 - a. True
 - b. False

3. A pyocele can be differentiated from a mucocele by soft tissue algorithm.
 - a. True
 - b. False

4. Calcifications in a paranasal sinus opacification are most likely due to fungal sinusitis.
 - a. True
 - b. False

5. Loss of bony delineation of the lateral nasal wall (medial maxillary wall) is an early sign of malignancy.
 - a. True
 - b. False

6. Small polyps in the nasal cavity are always benign.
 - a. True
 - b. False