

Pott's puffy tumour

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Section: Head & neck imaging

Area of Interest: Head and neck

Procedure: Diagnostic procedure

Imaging Technique: CT

Imaging Technique: MR

Special Focus: Inflammation Infection Abscess Case

Type: Clinical Cases

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Patient: 11 years, male

Clinical History:

11-year-old male patient presenting with frontal pain and swelling, occurring after a head trauma during a football game in the week before. The anamnesis revealed a history of treated sinusitis two months ago, with mild residual rhinorrhoea.

Imaging Findings:

The clinician suspected a fracture and requested a CT examination. The examination showed subtotal obliteration of the maxillary sinus bilaterally, as well as of the ethmoidal cells and of the left frontal sinus, interpreted as sinusitis (Fig. 1, 2), accompanied by an approximately 1.5x1.3 cm large destruction/osteolysis of the left frontal bone suggesting an osteomyelitis (Fig. 3, 4). A periosteal reaction of the wall of the maxillary sinus (Fig. 2) was observed, indicating chronic inflammatory disease. At the left frontal sinus an extra-axial (epidural) lesion (approx. 1.7x1 cm) suspected to be an abscess with impression of the frontal grey matter, and a subcutaneous swelling (Fig. 5) were seen. Further, for complete characterization and evaluation of the extent of the disease an enhanced MRI examination was performed, confirming the initial interpretation. A subperiosteal abscess of the forehead and an epidural abscess were diagnosed (Fig. 6, 7, 8). No cerebral involvement was detected. The patient underwent surgical treatment in addition to antibiotics.

Discussion:

Pott's puffy tumour is a rare condition in the antibiotic era, characterized by osteomyelitis of the frontal bone and subperiosteal abscess [1, 2, 3, 4, 5, 6, 7] as shown in this case. Usually it is a complication of acute or chronic sinusitis or trauma [1, 3, 5, 6, 7, 8, 9, 10, 11], seldom of acupuncture therapy [4] or postinterventional. (The anamnesis revealed in this case both possibilities - trauma and sinusitis - but sometimes one is misleading.) Pott's puffy tumour is more often diagnosed in men [1, 3, 4, 5, 7, 8, 9, 10] and paediatric or adolescent patients [1, 3, 4, 6, 8, 9, 11]. However, it occurs in adult patients, too [2, 5, 7, 10]. Presenting symptoms include swelling of the forehead, headache, fever, rhinorrhoea, vomiting, fatigue, and sometimes patients are asymptomatic [1, 3, 4, 6, 8, 9]. Complications of Pott's puffy tumour are epidural abscess, subdural empyema, brain abscess, cortical vein thrombosis, focal meningitis, orbital cellulitis [1, 3, 4, 6, 9, 11]. CT examination, especially if enhanced, reveals the pathology, which is sinusitis with opacification and obliteration of the sinus, defects with osteolysis of the frontal bone and/or the other previously described aspects and subperiosteal abscess [2, 3, 4, 8, 9, 10, 11]. Conventional radiography is obsolete in characterizing the extent of the disease [11]. Enhanced MRI is better for characterizing the extent of the disease and the intracranial or intraorbital complications [3, 9, 11]. Generally, antibiotics and

mostly also surgical intervention are required, especially in case of complications [2, 5, 7, 8, 9, 11].

Differential Diagnosis List: Pott's puffy tumour arising from sinusitis, Sinusitis, Abscess, Fracture, (Orbital) Cellulitis, Haematoma, Osteomyelitis, Non-Hodgkin's lymphoma [12], Lipoma

Final Diagnosis: Pott's puffy tumour arising from sinusitis

References:

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- Wong EH, Yang WY, Lowe D. (2013) Unilateral non-Hodgkin's lymphoma of the frontal sinus presenting as Pott's puffy tumour. *Otolaryngol Pol* 67(4):214-7 (PMID: [23911051](#))

Figure 1

a



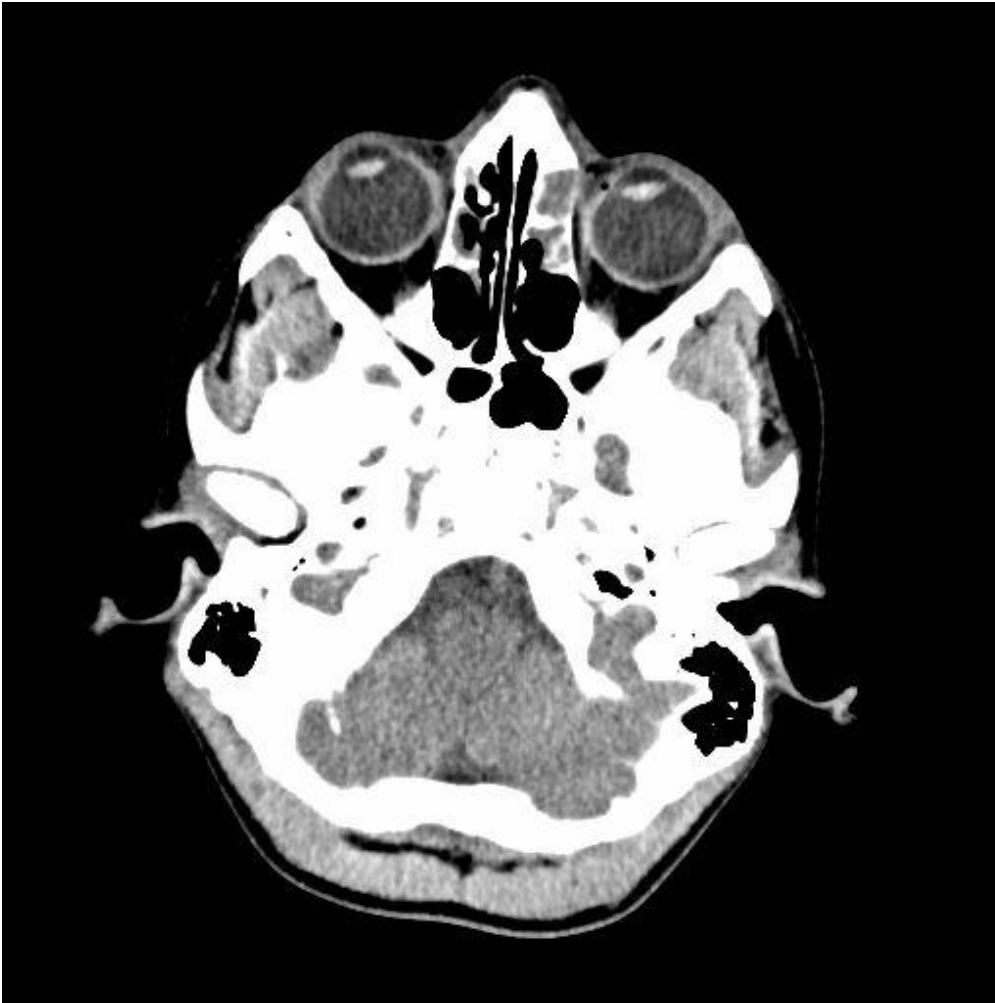
Description: Axial CT image showing obliteration of the maxillary sinus. **Origin:** Division of General Radiology, Department of Radiology, Medical University of Graz

b



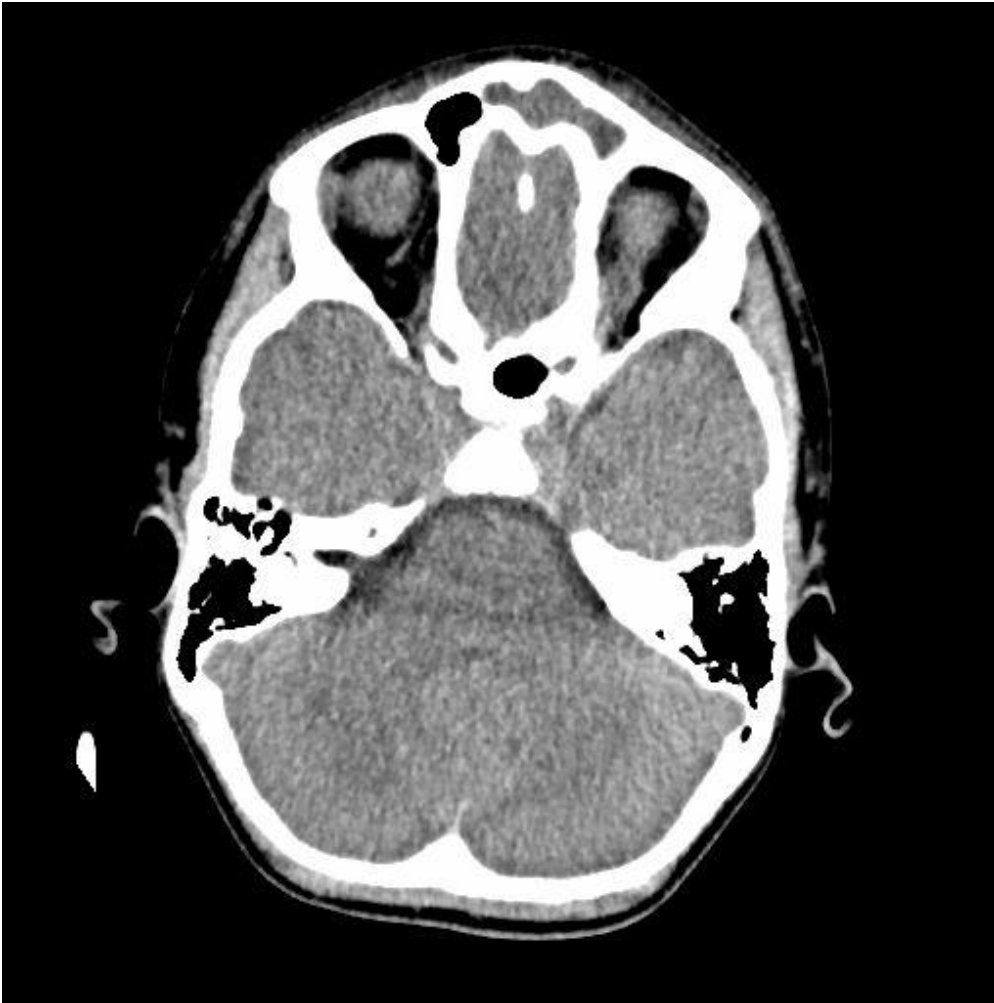
Description: Axial CT image showing obliteration of the maxillary sinus. **Origin:** Division of General Radiology, Department of Radiology, Medical University of Graz

c



Description: Axial CT image showing obliteration of the ethmoidal cells. **Origin:** Division of General Radiology, Department of Radiology, Medical University of Graz

d



Description: Axial CT image showing obliteration of the left frontal sinus. **Origin:** Division of General Radiology, Department of Radiology, Medical University of Graz

Figure 2

a



Description: Axial CT images, bone window, showing the periosteal reaction of the wall of the maxillary sinus, indicating a chronic inflammatory disease. **Origin:** Division of General Radiology, Department of Radiology, Medical university of Graz

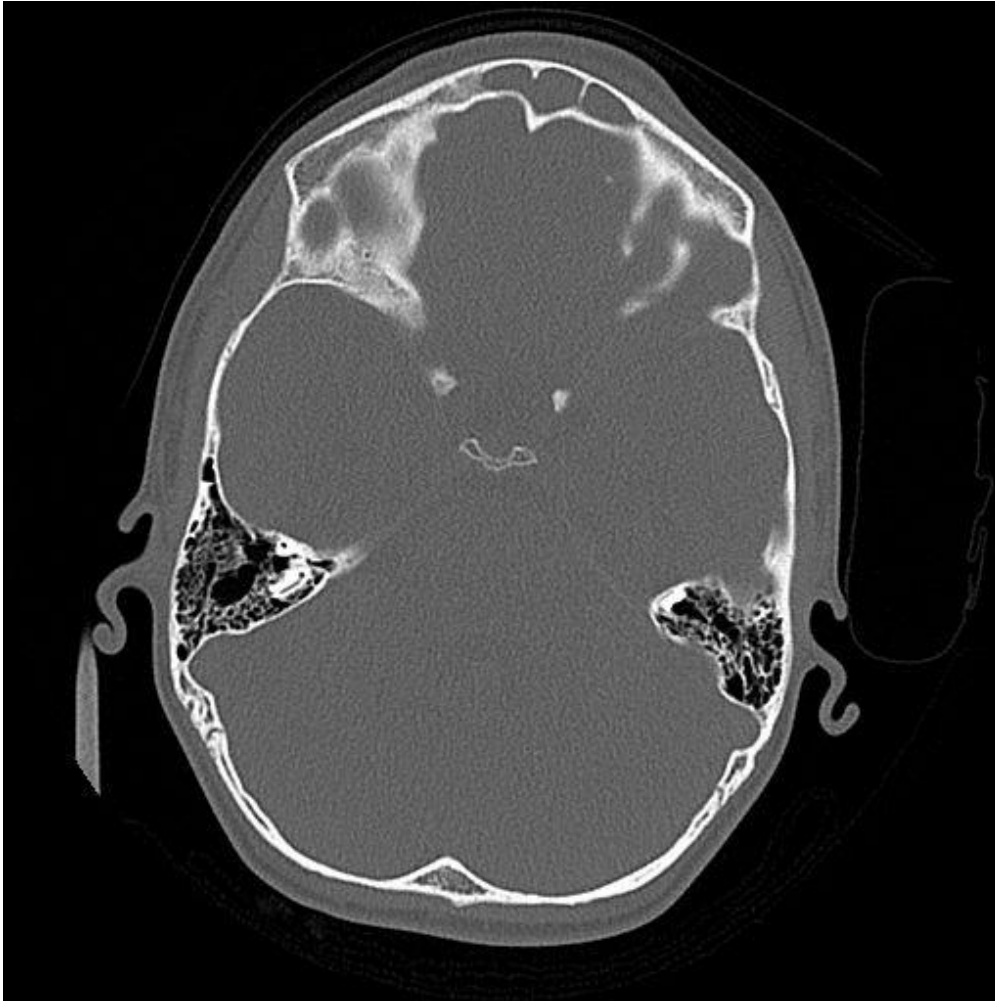
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Description: Axial CT images, bone window, showing the periosteal reaction of the wall of the maxillary sinus, indicating a chronic inflammatory disease. **Origin:** Division of General Radiology, Department of Radiology, Medical university of Graz

Figure 3

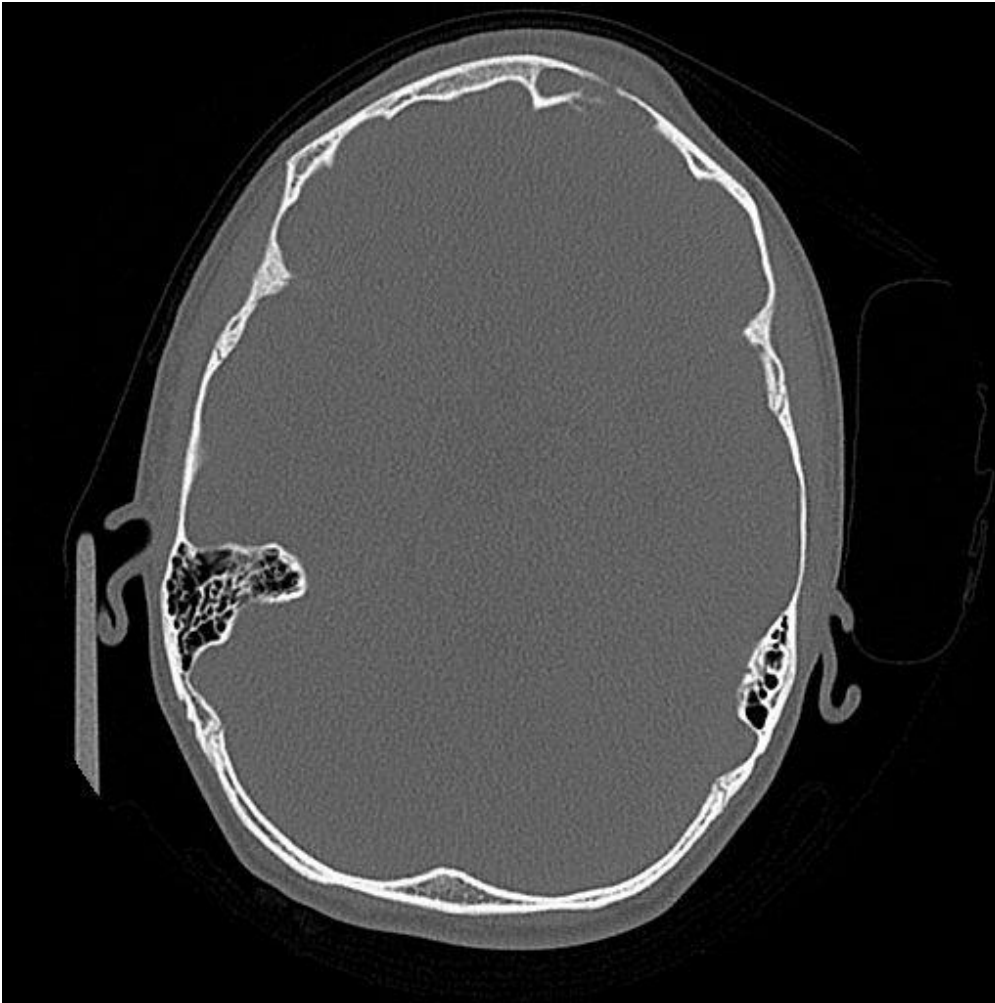
a



Description: Axial CT images, bone window, showing the intact wall of the left frontal sinus at this level.

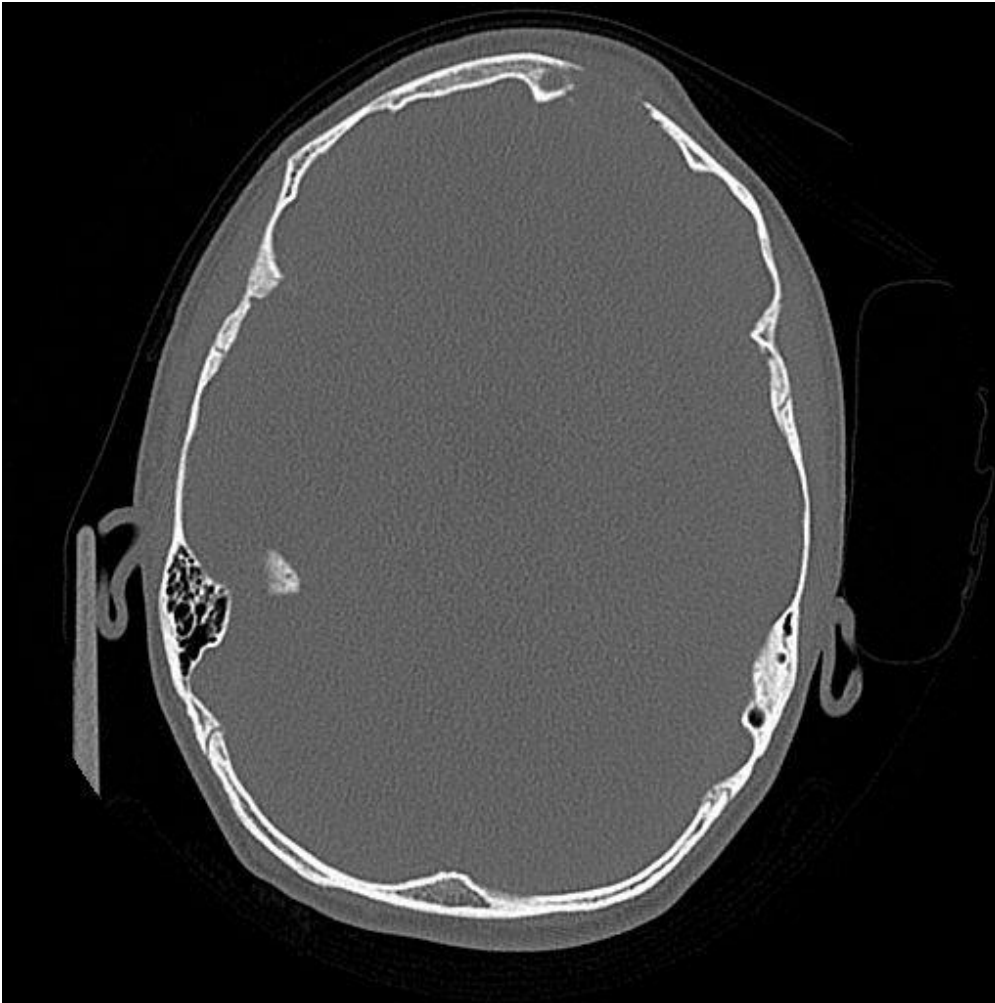
Origin: Division of General Radiology, Department of Radiology, Medical University of Graz

b



Description: Axial CT images, bone window, showing the destruction/ osteolysis of the left frontal bone, communicating with the frontal sinus. **Origin:** Division of General Radiology, Department of Radiology, Medical University of Graz

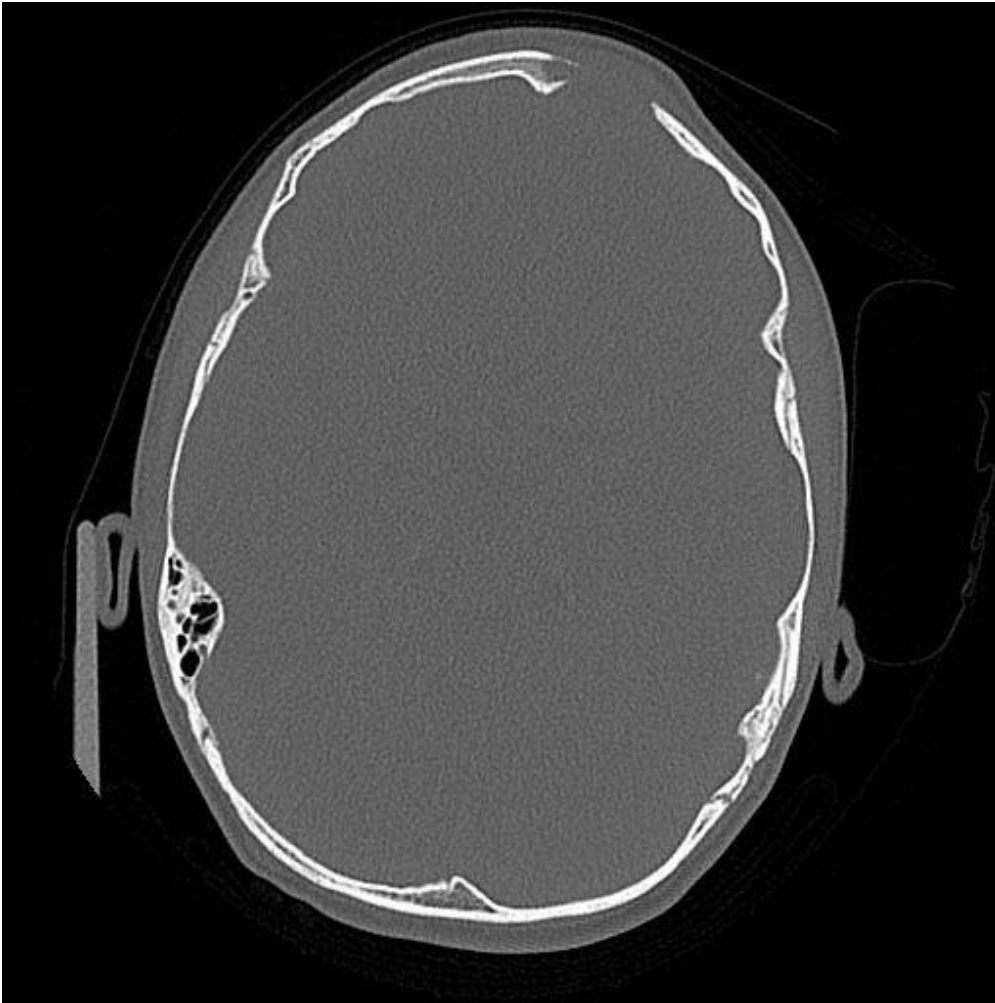
c



Description: Axial CT images, bone window, showing the osteolysis/destruction of the left frontal bone.

Origin: Division of General Radiology, Department of Radiology, Medical University of Graz

d



Description: Axial CT images, bone window, showing the osteolysis/destruction of the left frontal bone.

Origin: Division of General Radiology, Department of Radiology, Medical University of Graz

Figure 4

a



Description: Axial CT images showing the obliteration of the frontal sinus as well as the subcutaneous swelling. **Origin:** Division of General Radiology, Department of Radiology, Medical University of Graz

b



Description: Axial CT images showing the obliteration of the frontal sinus and the left frontal extra-axial inhomogeneous lesion - abscess as well as the subcutaneous swelling. **Origin:** Division of General Radiology, Department of Radiology, Medical University of Graz

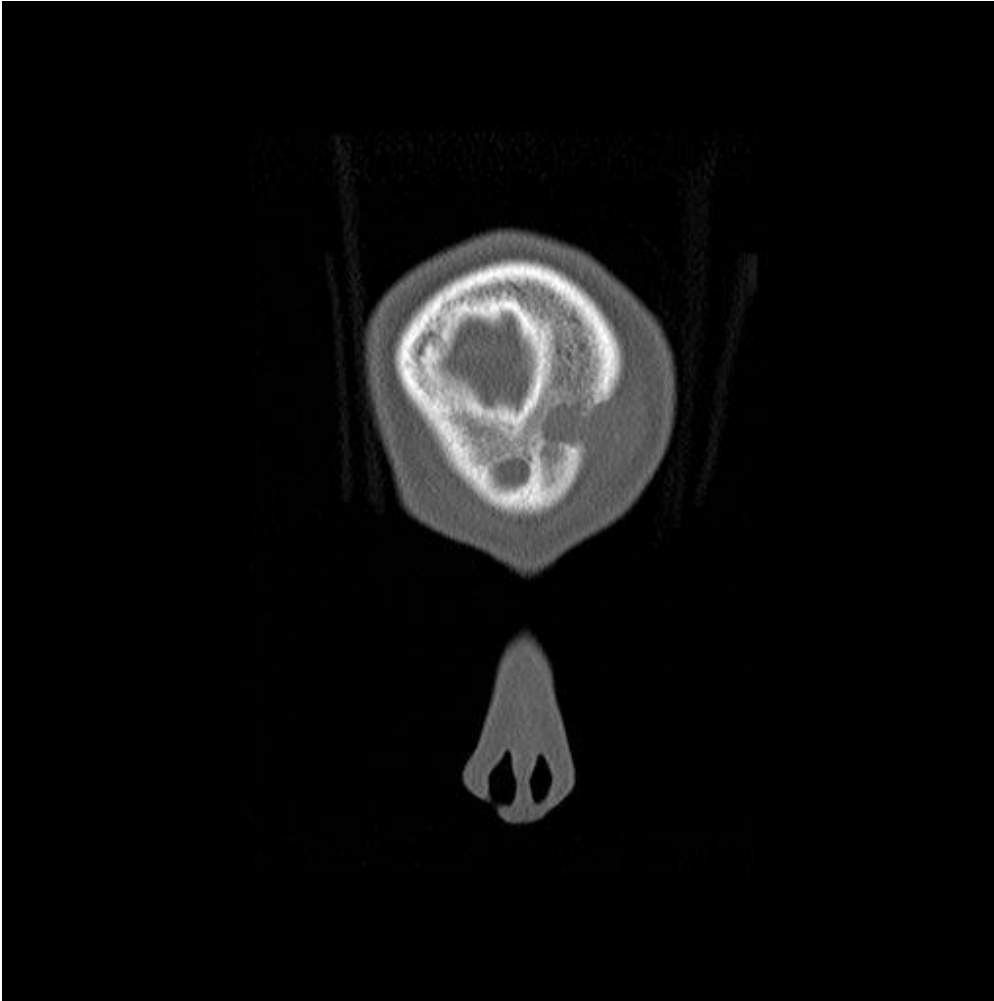
c



Description: Axial CT images showing the left frontal extra-axial inhomogeneous soft lesion - abscess as well as the subcutaneous swelling. **Origin:** Division of General Radiology, Department of Radiology, Medical University of Graz

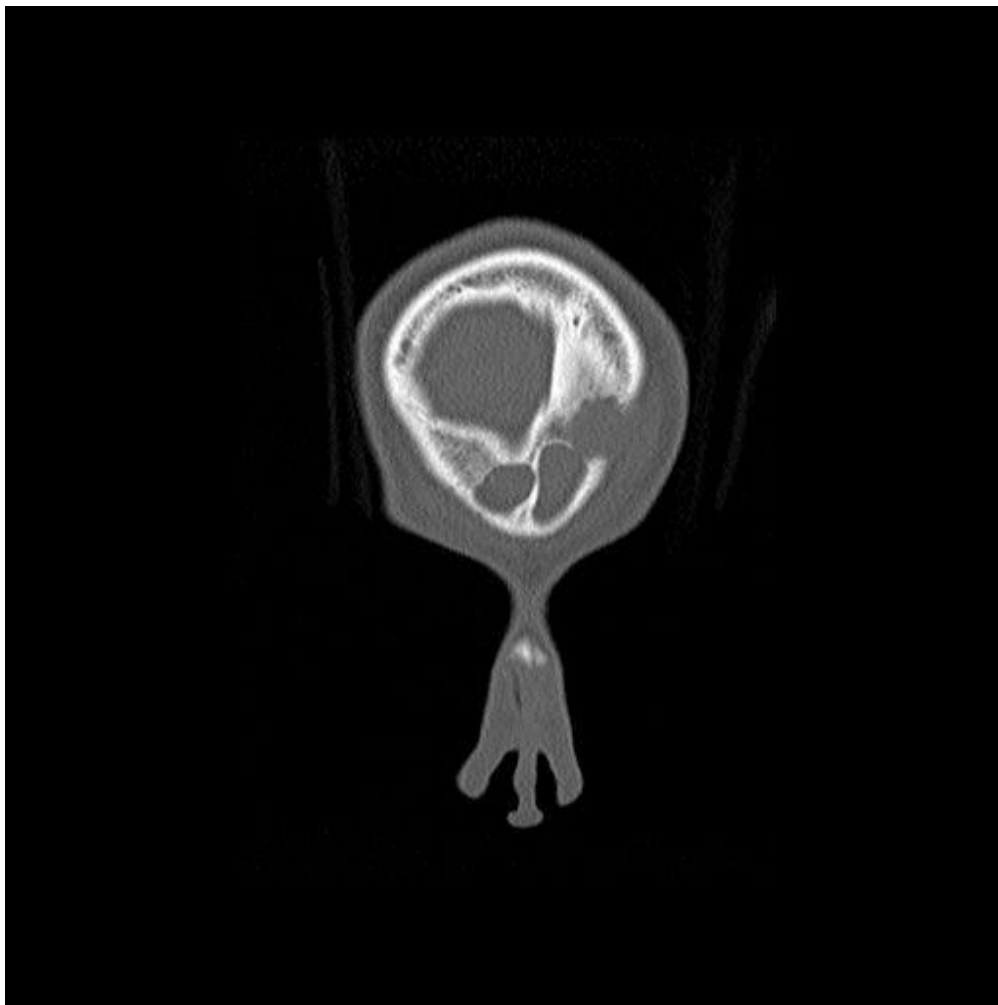
Figure 5

a



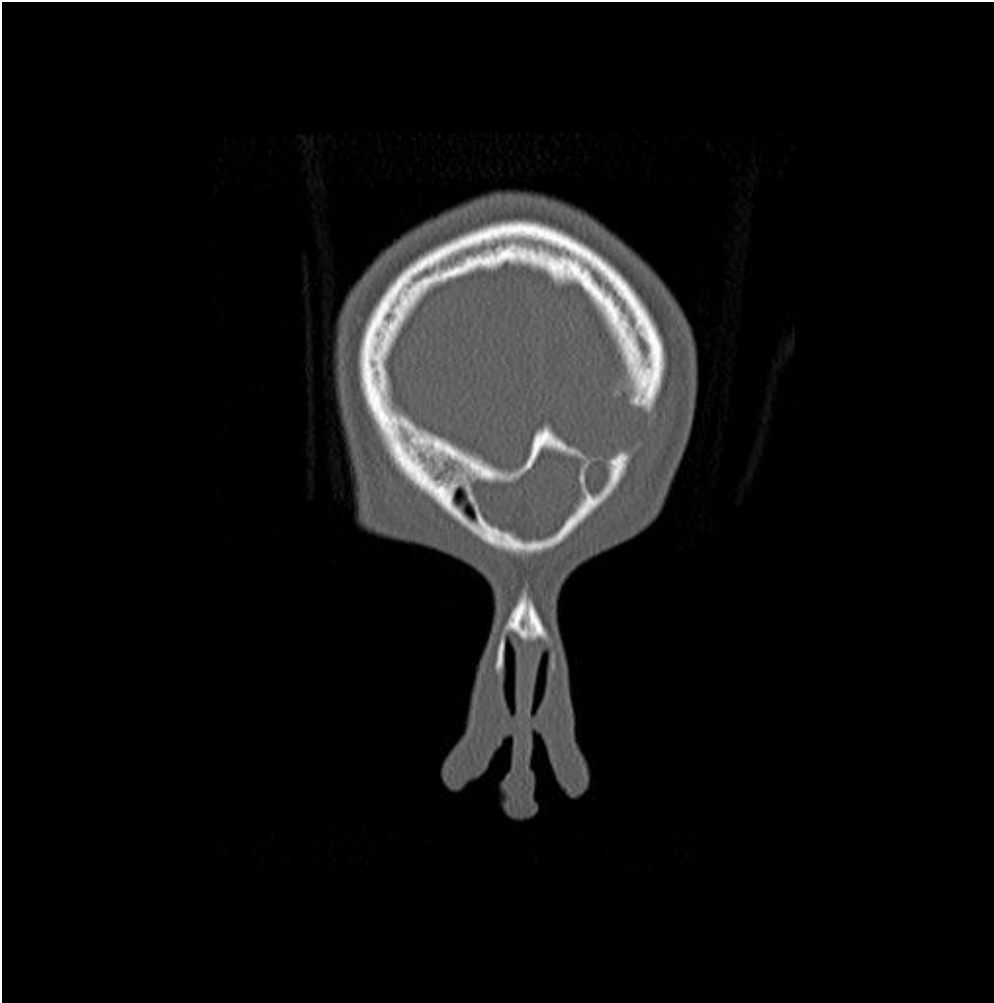
Description: Coronal reconstructed CT images, bone window, showing the osteolysis of the left frontal bone. **Origin:** Division of General Radiology, Department of Radiology, Medical University of Graz

b



Description: Coronal reconstructed CT images, bone window, showing the osteolysis of the left frontal bone. **Origin:** Division of General Radiology, Department of Radiology, Medical University of Graz

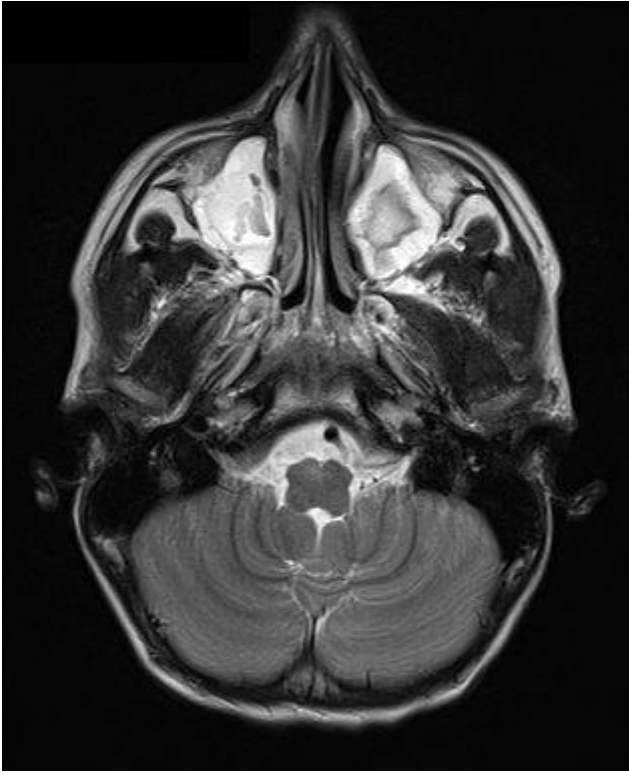
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Description: Coronal reconstructed CT images, bone window, showing the osteolysis of the left frontal bone. **Origin:** Division of General Radiology, Department of Radiology, Medical University of Graz

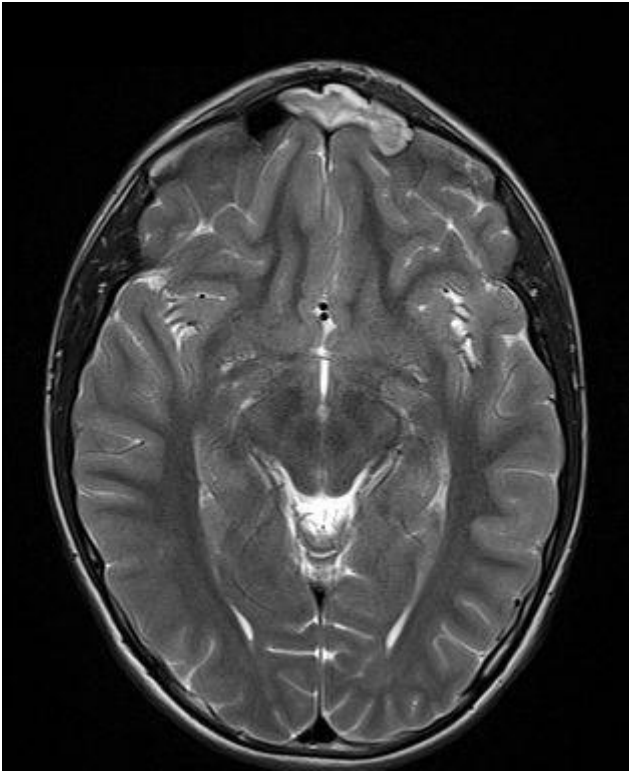
Figure 6

a



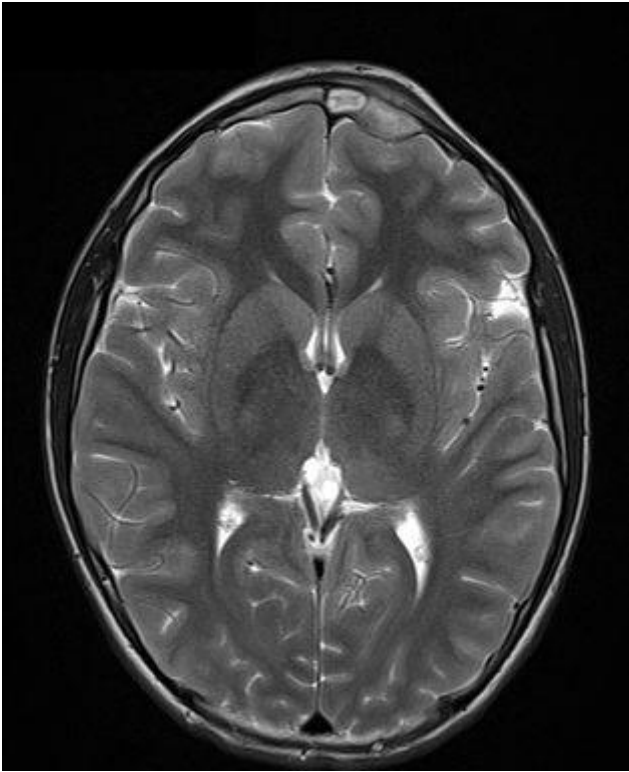
Description: Axial T2-weighted MR image showing maxillary sinusitis. **Origin:** Division of Neuroradiology, Department of Radiology, Medical University of Graz

b



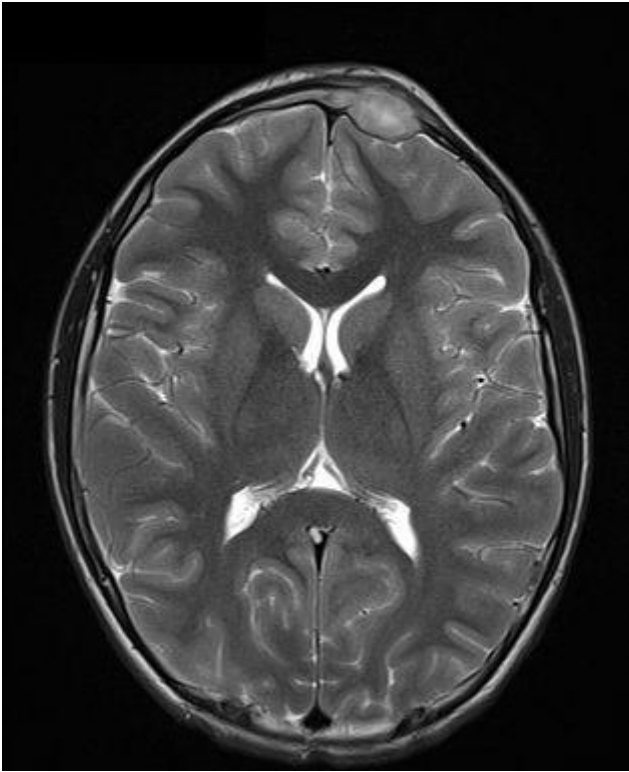
Description: Axial T2-weighted MR image showing frontal sinusitis. **Origin:** Division of Neuroradiology, Department of Radiology, Medical University of Graz

c



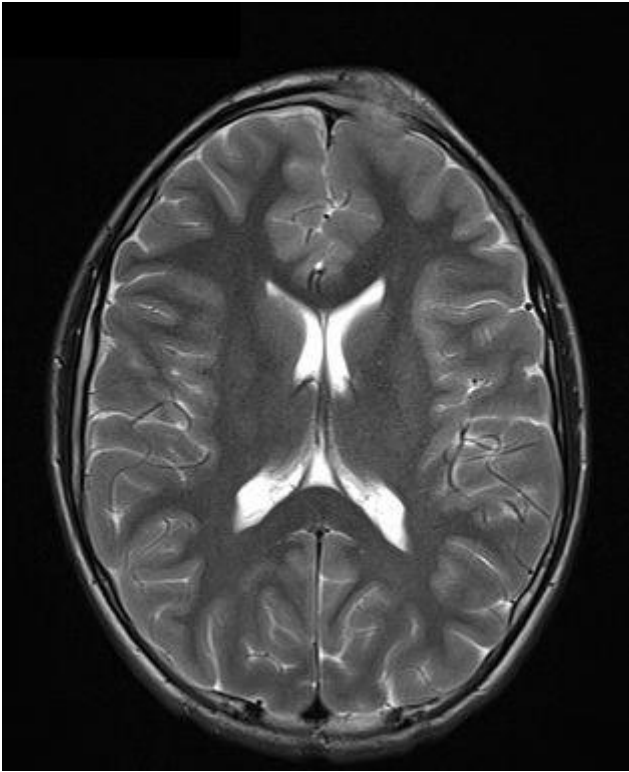
Description: Axial T2-weighted MR image showing the subperiosteal and epidural abscess as well as soft tissue swelling. **Origin:** Division of Neuroradiology, Department of Radiology, Medical University of Graz

d



Description: Axial T2-weighted MR image showing the subperiosteal and epidural abscess as well as soft tissue swelling. **Origin:** Division of Neuroradiology, Department of Radiology, Medical University of Graz

e



Description: Axial T2-weighted MR image showing the epidural abscess and soft tissue swelling.

Origin: Division of Neuroradiology, Department of Radiology, Medical University of Graz

Figure 7

a



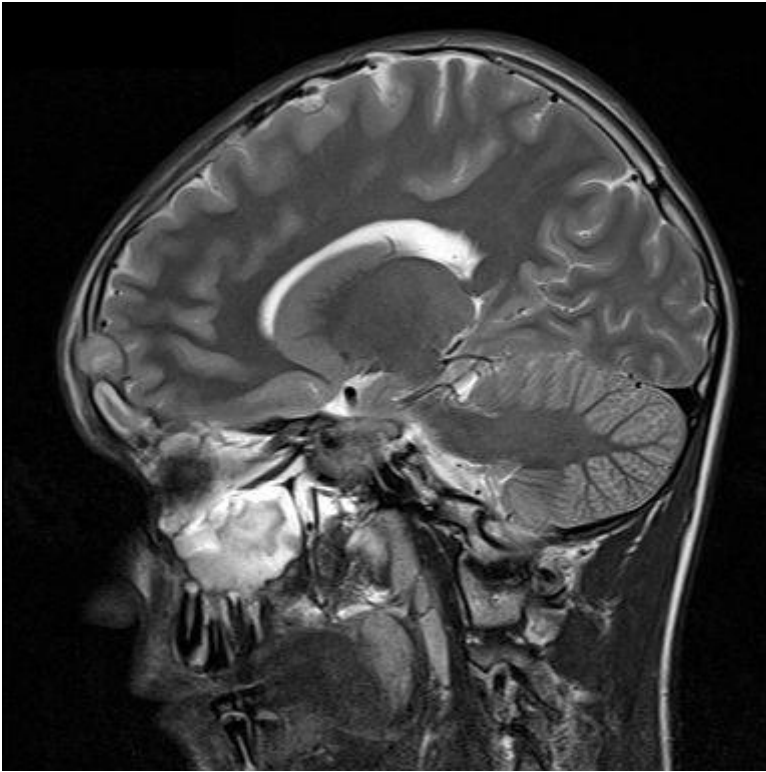
Description: Sagittal T2-weighted images showing frontal sinusitis. **Origin:** Division of Neuroradiology, Department of Radiology, Medical University of Graz

b



Description: Sagittal T2-weighted images showing the frontal and ethmoidal sinusitis and the subperiosteal epidural abscess. **Origin:** Division of Neuroradiology, Department of Radiology, Medical University of Graz

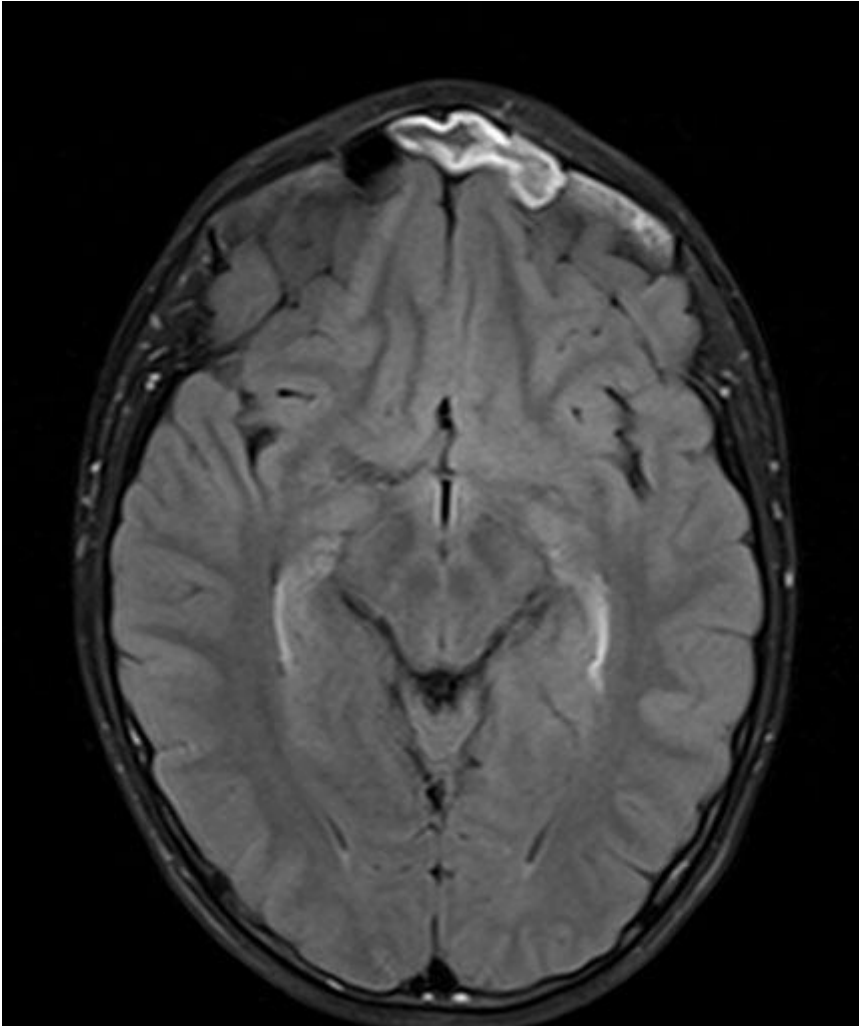
c



Description: Sagittal T2-weighted images showing the frontal and maxillary sinusitis as well as the subperiosteal abscess. **Origin:** Division of Neuroradiology, Department of Radiology, Medical University of Graz

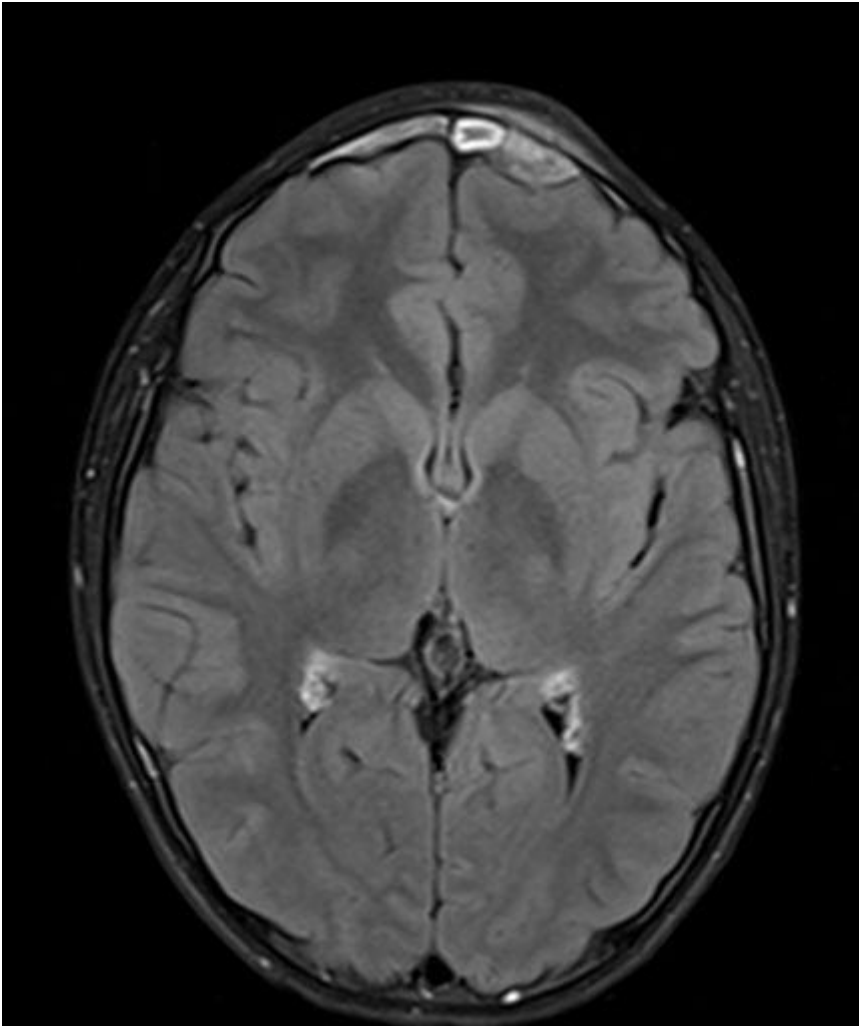
Figure 8

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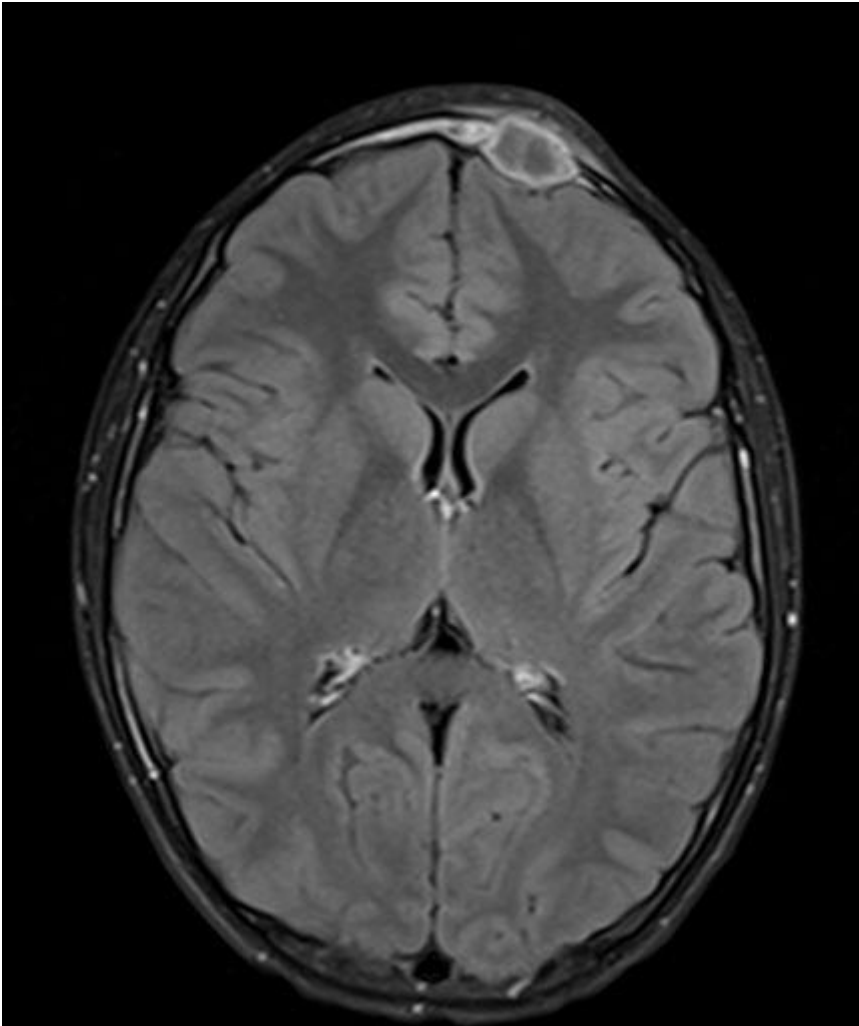
Description: Axial postcontrast T1-weighted MR image showing the frontal sinusitis. Note the enhancement of the dura mater. **Origin:** Division of Neuroradiology, Department of Radiology, Medical University of Graz

b



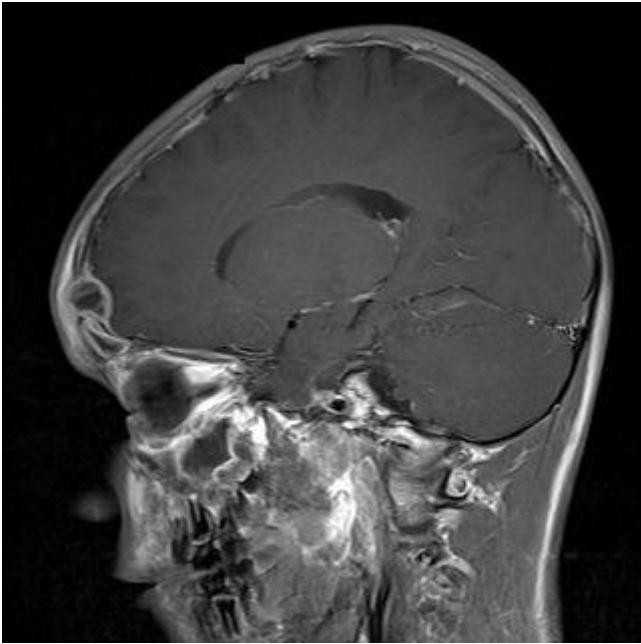
Description: Axial postcontrast T1-weighted MR image showing the frontal sinusitis, the subperiosteal abscess and the enhancement of the dura mater. **Origin:** Division of Neuroradiology, Department of Radiology, Medical University of Graz

c



Description: Axial postcontrast T1-weighted MR image showing the frontal sinusitis, the epidural abscess and the enhancement of the dura mater. **Origin:** Division of Neuroradiology, Department of Radiology, Medical University of Graz

d



Description: Sagittal postcontrast T1-weighted MR image showing the frontal and maxillary sinusitis and the epidural abscess. **Origin:** Division of Neuroradiology, Department of Radiology, Medical University of Graz