Pott’s Puffy Tumour: An Uncommon Complication of Sinusitis in An Adult
Published on 15.06.2020

DOI: 10.35100/eurorad/case.16785
ISSN: 1563-4086
Section: Head & neck imaging
Area of Interest: Ear / Nose / Throat Head and neck
Imaging Technique: CT
Imaging Technique: MR
Case Type: Clinical Cases
Authors: Van Gool F, Claikens B
Patient: 52 years, male

Clinical History:
A 52-year-old woman presented at the A&E with a dull pressure headache, nasal congestion and post-nasal drip. The patient was afebrile and clinical examination showed a soft, tender swelling of the forehead. No neurological or ocular deficits were present. Blood tests showed a slightly elevated CRP without leucocytosis.

Imaging Findings:
A contrast-enhanced CT-scan of the brain demonstrated a left-sided pansinusitis involving the maxillary, ethmoid and frontal sinuses. A cortical bone defect of the anterior frontal sinus wall was present with an adjacent rim enhancing subperiosteal abscess continuous with the frontal sinus. There were no signs of intracranial or orbital spreading of the infection. The next day an MRI was performed, which confirmed the cortical defect and subperiosteal abscess. There was also mild asymmetric frontal pachymeningeal thickening and enhancement visible of the adjacent dura. No intracranial abscesses were present. There were no parenchymal brain abnormalities or venous sinus thrombosis.

Discussion:
Background: Pott's puffy tumour refers to the clinical presentation of a frontal mass as a result of frontal osteomyelitis with a subperiosteal abscess. Most commonly it is a complication of frontal sinusitis, although it has become rare since the advent of antibiotics. It predominately affects children and adolescents, with less than 100 cases reported in adult patients. [1,2] It is hypothesised that children are more susceptible because of anatomic and physiologic changes in the developing frontal sinus. Mainly the looser connection between the frontal sinuses and the bone marrow space and the increased flow in the valveless diploic veins. [1,2] Clinical Perspective: The typical presentation of Pott's puffy tumour is a swelling of the forehead and upper eyelids with nasal congestion, headache and fever. [3-7] Although the clinical entity is notorious among otolaryngologists, other departments are less familiar with it. [1] Image Perspective: Imaging plays a vital role in identifying the sinusitis and assessment of other complications. Complications can be divided based on the direction of spread. Anterior spreading causes the classic frontal subperiosteal abscess, which can result in a sinocutaneous fistula. [4,8] Posterior spreading may lead to
malignant meningitis, intracranial abscesses or thrombophlebitis of the intracranial venous sinuses. [4,5,7,9,10] A rarer direction of infectious spreading is through the inferior wall, which results in preseptal and orbital cellulitis. [4,7,10–12] Contrast-enhanced CT-scan is in most cases the initial imaging modality because it is fast, readily available and has excellent bone contrast. [7,12] MRI is superior in evaluating early signs of osteomyelitis and the subcutaneous, intracranial and intra-orbital soft tissues. Therefore there should be a low threshold for performing an additional MRI, especially in patients with neurological or orbital symptoms. [7,9,12] A common mimic is a mucocele, which can be expansile and cause erosion of the adjacent bone. However, osteomyelitis or inflammation of the soft tissues is not present in those cases. [13] Outcome: Urgent treatment with intravenous antibiotics is crucial in treating the abscesses and preventing further spreading of the disease. Antibiotic therapy alone is rarely sufficient, and surgical drainage is often necessary. The surgical approach will depend on the extent of the infection. In cases of localised disease, good results are achieved with endoscopic drainage. In more complex cases, extensive resection and bone reconstruction might be necessary. [5,14] Teaching Points: Pott's puffy tumour is an uncommon complication of frontal sinusitis. Transcortical spreading can result in severe intracranial and orbital complications. Early detection and treatment are crucial because of these potentially life-threatening complications.

**Differential Diagnosis List:** Pott's puffy tumour, Epidermoid, Mucocele, Dermoid, Skin/soft tissue tumours (lipoma), Skin/soft tissue infections (scalp abscess), Haematoma, Primary squamous cell carcinoma of the frontal sinus, Langerhans Cell Histiocytosis

**Final Diagnosis:** Pott’s puffy tumour

**References:**


**Figure 1**

Description: CECT COR bone window. Pansinusitis on the left side. **Origin:** © Department of Radiology, AZ Damiaan Hospital, Ostend, Belgium, 2016
Description: CECT AX bone window. Bone defect of the anterior wall of the frontal sinus with adjacent subperiosteal abscess. Origin: © Department of Radiology, AZ Damiaan Hospital, Ostend, Belgium, 2016
Description: CECT AX soft tissue window. Bone defect of the anterior wall of the frontal sinus with adjacent subperiosteal abscess. Origin: © Department of Radiology, AZ Damiaan Hospital, Ostend, Belgium, 2016
Figure 3

Description: CECT SAG bone window. Bone defect of the anterior wall of the frontal sinus with adjacent subperiosteal abscess. Origin: © Department of Radiology, AZ Damiaan Hospital, Ostend, Belgium, 2016
Description: CECT SAG soft tissue window. Bone defect of the anterior wall of the frontal sinus with adjacent subperiosteal abscess. Origin: © Department of Radiology, AZ Damiaan Hospital, Ostend, Belgium, 2016
Figure 4

a

Description: MRI T2 AX. Frontal sinusitis. Origin: © Department of Radiology, AZ Damiaan Hospital, Ostend, Belgium, 2016

b

Description: MRI T1 AX. Frontal sinusitis. Origin: © Department of Radiology, AZ Damiaan Hospital, Ostend, Belgium, 2016
Description: MRI T1 dixon AX + Contrast. Frontal sinusitis with irregular enhancement of the adjacent bone marrow. Origin: © Department of Radiology, AZ Damiaan Hospital, Ostend, Belgium, 2016
**Description:** MRI T1 dixon AX + Contrast. Frontal pachymeningeal thickening and enhancement adjacent to frontal sinusitis and osteomyelitis. **Origin:** © Department of Radiology, AZ Damiaan Hospital, Ostend, Belgium, 2016
Description: MRI T2 AX. Bone defect of the anterior wall of the frontal sinus with adjacent subperiosteal abscess. Origin: © Department of Radiology, AZ Damiaan Hospital, Ostend, Belgium, 2016
**Description:** MRI T1 AX. Bone defect of the anterior wall of the frontal sinus with adjacent subperiosteal abscess. **Origin:** © Department of Radiology, AZ Damiaan Hospital, Ostend, Belgium, 2016
Description: MRI T1 dixon AX + Contrast. Bone defect of the anterior wall of the frontal sinus with adjacent subperiosteal abscess. Origin: © Department of Radiology, AZ Damiaan Hospital, Ostend, Belgium, 2016
Description: MRI T2 SAG. Bone defect of the anterior wall of the frontal sinus with adjacent subperiosteal abscess. Origin: © Department of Radiology, AZ Damiaan Hospital, Ostend, Belgium, 2016
Description: MRI T1 dixon SAG + Contrast. Bone defect of the anterior wall of the frontal sinus with adjacent subperiosteal abscess. Origin: © Department of Radiology, AZ Damiaan Hospital, Ostend, Belgium, 2016