Coalescent mastoiditis with subperiosteal abscess
Published on 10.04.2011

DOI: 10.1594/EURORAD/CASE.9238
ISSN: 1563-4086
Section: Head & neck imaging
Area of Interest: Ear / Nose / Throat
Imaging Technique: MR
Imaging Technique: CT
Special Focus: Infection Inflammation Abscess
Deminerisation-Bone Case Type: Clinical Cases
Authors: Carcaciá I, Prieto P, Arias Y, Pérez C, Pérez-Cid J, Pardo P.
Patient: 42 years, male

Clinical History:
A 42-year-old man had a 1-week history of progressive right-side postauricular pain and swelling. He had a headache but no meningeal signs. His temperature was 37.2 ºC.

Imaging Findings:
An unenhanced CT scan of the temporal bone and brain demonstrated middle ear fluid and opacification of the right mastoid air cells, combined with resorption of intercellular walls. An irregular cavity (resulting from erosion of air cells partition) in upper mastoid was observed. There was erosion of the outer cortex with a subperiosteal abscess. No intracranial complications were identified. There was normal aeration of the mastoid air cells on the left side.
The patient underwent simple mastoidectomy and intravenous antibiotics were administered. A contrast MRI was performed in order to evaluate radiological evolution of the mastoiditis and to prevent intracranial complications. T2-weighted MR images demonstrate less fluid retention within the right mastoid cells. A small subperiosteal abscess was detectable on postcontrast T1-weighted MR images. No intraaxial collections were identified.

Discussion:
Acute otitis media (AOM) is the most common localised infectious process occurring in the first five years of life. The clinical course of AOM is usually short. However, a small proportion of patients may experience complications. These complications can now be more difficult to diagnose because antibiotics may mask symptoms that can alert the physicians to the diagnosis.

Acute otomastoiditis was defined as AOM and the presence of at least one of the clinically characteristic local signs of mastoiditis (retroauricular erythema, swelling, tenderness, protrusion of the auricle).

The following pathological stages are successively encountered in the development of acute mastoiditis:
• Blocking of the aditus ad antrum;
• Trapping of exudate in mastoid cells (simple mastoiditis);
• Demineralisation of bone septa and osteonecrosis of thinner mastoid walls with creation of large purulent cavities (coalescent otomastoiditis).

From a clinical perspective coalescent mastoiditis is suspected in the presence of abundant ear discharge, pain and
mastoid tenderness. Because treatment of coalescent mastoiditis commonly includes an urgent cortical mastoidectomy, prompt identification of this condition is necessary. At HR-CT coalescence was defined as loss of the honeycomb-like trabecular septae and/or erosion of the cortical bone visualised. The diagnosis is obtained comparing the number, thickness and mineralisation of mastoid intercellular trabeculae with the contralateral side, even though asymmetry is not uncommon. In the absence of other indications, a negative HR-CT with regard to coalescence is sufficient to obviate the necessity of surgery. The coalescent mastoiditis can follow a more acute and aggressive course (coalescent acute mastoiditis) or a more subclinical progression (latent or “masked” mastoiditis). Because of a masking effect, the acute symptoms will be lacking. A CT scan of the brain and temporal bones is essential for the work-up and management of patients suspected to have a complication. The pus retained in the closed mastoid can perforate the external mastoid cortex and lie beneath the periosteum, resulting in a subperiosteal abscess.

CT should be performed early in the course of the disease to classify the mastoiditis as incipient or coalescent and to detect intracranial complications. In addition, MRI is performed in patients with clinical symptoms or CT findings suggestive of intracranial complications because of its higher sensitivity for detection of extraaxial fluid collections and associated vascular problems. On the basis of the clinical and imaging findings, the disease is managed conservatively with intravenously administered antibiotics or treated with mastoidectomy and drainage plus antibiotic therapy.

**Differential Diagnosis List:** Coalescent right mastoiditis with subperiosteal abscess, Coalescent mastoiditis with Bezold’s abscess, Cholesteatoma

**Final Diagnosis:** Coalescent right mastoiditis with subperiosteal abscess

**References:**

Figure 1

description: Coronal CT image (bone window) shows opacification of the right mastoid air cells combined with resorption of intercellular walls. There is erosion of the external mastoid cortex and thickening of perimastoid soft-tissues. Origin:
Description: Coronal CT image (soft-tissue window) demonstrates a large subperiosteal abscess.
Origin:
Description: Axial CT scan (bone window) shows erosion of the external mastoid cortex with swelling of perimastoid soft-tissues. Origin:
Description: Axial CT scan of the temporal bone (bone window) demonstrates increased attenuation of the middle ear and mastoid antrum on the right side. There are air bubbles in perimastoid soft-tissues.

Origin:
**Figure 2**

Description: Axial T2-weighted MR image shows fluid retention within the right mastoid. **Origin:**

Description: Coronal T2-weighted MR image shows fluid retention within the right mastoid with small residual subperiosteal abscess after treatment. **Origin:**
Description: Axial precontrast and postcontrast T1-weighted MR images demonstrate enhancement of the small residual subperiosteal collection after treatment. No intraaxial collections were identified.

Origin: