Case Report

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Ruptured, Intracranial Dermoid Cyst - A Visual Diagnosis?

Radiology Section

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ABSTRACT

Dermoid cysts are a very rare entity of intracranial tumours. The traumatic or non-traumatic rupture of the cyst wall is a serious complication that can be treated surgically or conservatively depending on the clinical symptoms. However, more common entities have to be considered as a differential diagnosis.

We report on a female patient who was admitted with complaints of significant, prolonged headache and diffuse pain. Analysis of her blood and cerebrospinal fluid indicated no clear pathology. A CT examination of the head revealed a ruptured dermoid cyst adjacent to the left sphenoidal bone. An additional MRI was conducted to confirm the CT findings and rule out an intracranial ischemia or vasospasms. A conservative therapy was scheduled and the patient recovered well.

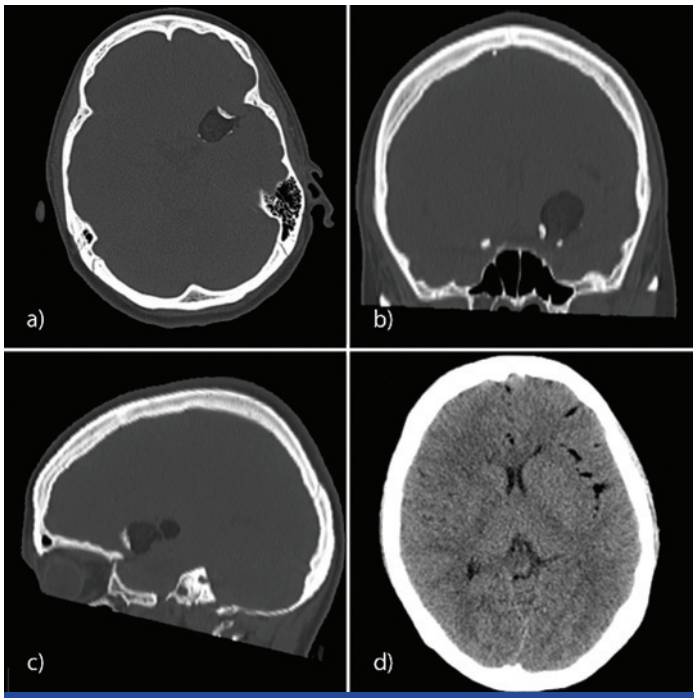
Using current imaging techniques, especially magnetic resonance imaging, it is possible to identify a ruptured dermoid cyst by its pathognomonic signal behavior and rule out potentially life threatening complications.

Keywords: Contrast enhanced, CT, Fat droplets, MRI

CASE REPORT

A 27-year-old patient presented in our clinic with complaints of progressive headache and pain since many days. The pain was diffused, located on the right side of the body, more prominently at the facial and brachial regions. There was no history of sensory nor motor deficits, no loss of coordination. No previous history of trauma or surgery. A lumbar puncture was immediately carried out, which revealed no evidence of pathological cells in the cerebrospinal fluid. Except for a hypertriglyceridaemia, the blood analysis was in the normal range.

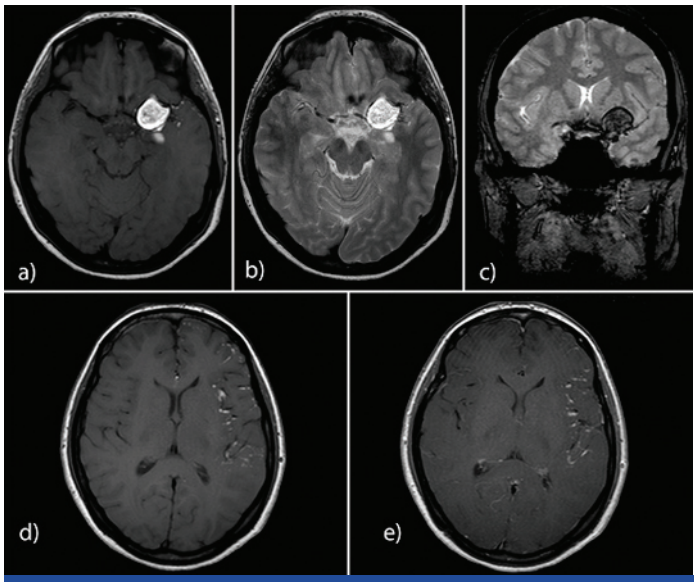
To rule out an intracranial bleeding, a native, Cranial Computed Tomography (CCT) (Phillips Brilliance 16 Fa.) was carried out with a slice thickness of 3mm and tilted parallel to the orbitomeatal line. It revealed a hypodense lesion with a density of about -85 HU and peripheral calcification, adjacent to the left sphenoidal bone. In addition, multiple, drop-shaped fat isodense structures (c. -70 HU) were found in the subarachnoid space in the left hemisphere [Table/Fig-1a-d].



[Table/Fig-1]: (a-c) Sharply defined, marginal calcified structure parasellar left with density values of about -90 HU in the bone window. (d) Fat isodense, floating, small structures in the left subarachnoid space, frontal and parietal.

A subsequently performed cranial MRI examination (MRI - Philips Achieva 3T) with axial T1- and T2-weighted sequences, DWI and T1-weighted sequences after administration of gadolinium-based contrast agent (ProHance ™) confirmed the suspected diagnosis of a ruptured dermoid cyst [Table/Fig-2a-e]. A TOF angiography carried out afterwards ruled out vasospasms. Cerebral ischemia was not detected in the DWI sequences.

In this particular case, conservative treatment was chosen, due to the less pronounced clinical picture and the location of the dermoid cyst. A medical pain therapy consisting of a combination of Paracetamol, Metamizole and Etoricoxib was initiated. The



[Table/Fig-2]: (a-c) Smooth structure, fat equivalent in the T1 and T2 weighted images parasellar left with marginal susceptibility artifacts in T2 * as an expression of calcifications. (d) Fat - isointense drops in the subarachnoid space suggesting a rupture of the cyst. (e) No increased intensity of the structure in the gadolinium DTPA enhanced T1w images. All in all pathognomonic presentation of a ruptured dermoid cyst.

patient was discharged on a full recovery and without neurological symptoms after one week.

The follow-up MRI after 3 months showed an unaltered image of the ruptured dermoid cyst.

DISCUSSION

Intracranial dermoid cysts are extremely rare, slow-growing, congenital inclusion cysts, that arise from an ectodermal inclusion in the development of the neural tube in the 3rd to 5th week of embryogenesis [1]. As a result of this, they tend to occur in the posterior skull base and the supra- and parasellar region [2]. The secretion and accumulation of abraded epithelium, sebaceous gland secretion or fat, oil and hair lead to a yellowish secretion with subsequent slow growth of the cyst [1,3–5]. Symptomatic complications usually occur in the 2nd to 3rd decade of life, either by a space-occupying effect, rupture or rupture-associated complications [3,6]. Although most ruptures of dermoid cysts occur spontaneously, some cases with traumatic rupture are described [1–5].

Possible non-specific symptoms of a growing dermoid cyst are nausea, vomiting, headache or dizziness [2–4,6,7].

In case of a rupture, the fatty cyst content empties itself into the subarachnoid space and can lead to aseptic meningitis with vasospasm, cerebral ischemia, hydrocephalus or epileptic seizures [3]. Corresponding symptoms do not have to occur simultaneously after rupture.

Irritation followed by meningitis may also occur years later [2,6].

Epidermoid cysts, lipoma, arachnoid cysts or a cystic craniopharyngioma are possible differential diagnosis to a dermoid cyst [1,3,4,6,8].

The high fat content and the disseminated fat drops of the ruptured dermoid cyst are responsible for the pathognomonic findings on radiological imaging. After rupture of the cyst, the content empties itself and is distributed in a drop-shaped form in the subarachnoid space.

The CT scan shows a smooth delineated, hypodense lesion with a density of about -50 to -100 HU and possible peripheral calcifications as well as, multiple, small, hypodense areas in the subarachnoid space after rupture [1,3,4,6–9].

In T2-weighted MRI sequences, the cysts are usually hyperintense and in the fat- suppressed sequences, signal-free. The cysts show no increased contrast uptake after the administration of a gadolinium-containing contrast agent [1,3,6,7]. The presence of intraluminal hair follicles or sweat glands results in an inhomogeneous appearance of the cyst [2].

The fat droplets show unchanged signal intensity in T1-weighted sequences as well as in the contrast-agent enhanced T1 sequences.

CONCLUSION

The rupture of an intracranial dermoid cyst is a serious complication which is diagnosed securely by means of contrast agent enhanced MRI. The MRI protocol should include a TOF angiography and a DWI sequence for the detection of vasospasm or fresh ischemia. Further therapy can be decided in conjunction with the clinical picture: operatively or conservatively.

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