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Medical Imaging Quiz – Case 53

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A 25-year-old man presented to the emergency department due to headache and irritability for 48 hours. Relatives referred that he suffered from acute psychiatric symptoms the last two months. There was no history of head trauma or cranial surgery. At initial physical examination body temperature, blood pressure and pulses were normal. Neurological examination revealed photophobia and stiff neck. Laboratory tests and electrocardiogram were normal. The computed tomography (CT) scan revealed a huge hypodense lesion in the region of foramina of Monro with multiple calcifications. In addition, small hypodense areas, disseminated possible fat droplets, were seen in the subarachnoid space. To confirm the diagnosis, magnetic resonance imaging (MRI) was performed and areas of high signal (fatty particles) into the subarachnoid space were seen.

Comment

Intracranial dermoid cysts are uncommon benign lesions (0.04–0.6% of all intracranial tumors) with characteristic imaging appearances. Typically, dermoid cysts present in the first three decades of life. These slow-growing tumors are usually well-defined lobulated midline masses that have low attenuation (fat density) on CT and high signal intensity on T1-weighted MR images. Dermoid cysts are thought to occur as a developmental anomaly in which embryonic ectoderm is trapped in the closing neural tube between the 5th–6th weeks of gestation. Dermoid cysts are lined by stratified squamous epithelium and contain epidermal appendages, such as hair follicles, sweat glands and sebaceous glands. The latter secrete the sebum that gives the characteristic appearance of these lesions on CT and MRI.

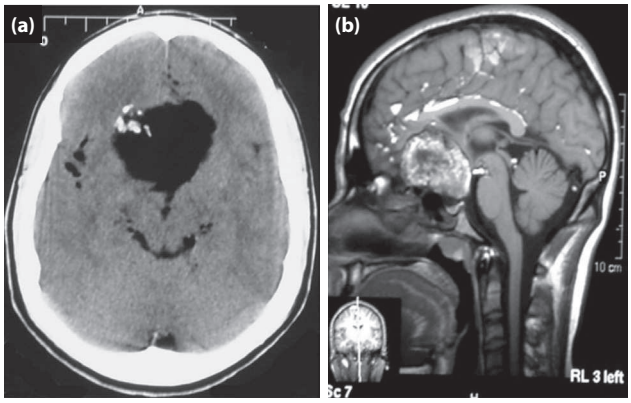

Figure 1. (a) Computed tomography (CT) scan revealed a big lesion in the region of foramina of Monro with fat density and numerous calcifications. Multiple fat density areas in the subarachnoid space. (b) Sagittal magnetic resonance imaging (MRI) scan revealing the lesion and areas of high signal in the subarachnoid space.

Many intracranial dermoid cysts are asymptomatic and are only found incidentally. Often there is a long history of vague symptoms, with headache being a prominent feature. Symptomatic clinical presentation usually occurs either due to mass effect or rupture (spontaneous, traumatic, or iatrogenic). Rupture can cause leakage of sebum into the subarachnoid space results in aseptic chemical meningitis. The presentation is variable, ranging from a headache to seizures, vasospasm, and even death.

Typically dermoid cysts appear as well defined low attenuating (fat density) lobulated masses. Calcification may be present in the wall. Enhancement is uncommon, and if present should at most be a thin peripheral rim. Very rarely they demonstrate hyperdensity, thought to be due to a combination of saponification, microcalcification and blood products. This most often occurs when present in the posterior fossa, although the reason is uncertain.

Intracranial dermoids have variable signal characteristics in MRI. Imaging findings typically hyperintense (due to cholesterol components), hyperintense droplets in the subarachnoid space may be visible if rupture has occurred in T1.

Dermoid cysts, when symptomatic, can be surgically excised. Recurrence is uncommon, provided that complete excision is achieved. Sometimes, due to local adhesion of the capsule to vital structures, incomplete excision must be performed. In either case, recurrent growth is slow.

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Diagnosis: *Ruptured intracranial dermoid cyst*