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CASE REPORT

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Spontaneous rupture of intracranial dermoid tumor in a patient with vertigo. Computed tomography and magnetic resonance imaging findings

Kıyasettin Asil[1], Yasemin Gunduz[1], Laçin Tatli Ayhan[1], Yakup Ersel Aksoy[1], Can Yildiz[2]

[1] Deparment of Radiology, Sakarya University Medical Faculty, Sakarya, Turkey
[2] Deparment of Neurosurgery, Sakarya University Medical Faculty, Sakarya, Turkey

Author's address: Yasemin Gunduz, Deparment of Radiology, Sakarya University Medical Faculty, 54100, Korucuk, Sakarya, Turkey, e-mail: dryaseminguduz@yahoo.com

Summary

Background: Congenital dermoid cysts are very rare, constituting less than 1% of intracranial tumors. Spontaneous rupture of dermoid tumor is a potentially serious complication that can lead to meningitis, seizures, cerebral ischemia and hydrocephalus. Occasionally, dermoid tumors are incidentally discovered on computed tomography (CT) of the brain or magnetic resonance imaging (MRI) following unrelated clinical complaints. They are also discovered during radiologic investigations of unexplained headaches, seizures, and rarely olfactory delusions.

Case Report: In this report we describe a patient complaining of vertigo caused by spontaneous rupture of dermoid cyst, preoperatively diagnosed by CT and MRI. Cranial CT revealed a dense fatty lesion adjacent to the posterolateral parasellar region on the left with multiple small, dense fat droplets scattered in the subarachnoid space corresponding to a dermoid cyst rupture. Cranial MRI sections revealed a lesion with mixed-signal-intensity and multiple hyperintense droplets scattered through the cerebellar surface on the left. No enhancement was found on axial T1-weighted MRI after intravenous Gadolinium administration. Diffusion weighted image (DWI) and apparent diffusion coefficient map studies exhibited explicit restricted diffusion.

Discussion: Many studies and literature case reports concerning the rupture of dermoid cyst have been reported. However, multimodal imaging of this rare pathology in the same patient is uncommon. Although dermoid cysts are pathognomonic in appearance on a CT examination, the MRI is also of value in helping to understand the effect of extension and pressure of the mass. DWI is also important for support of the diagnosis and patient follow-up.

Key words: rupture • dermoid tumor • vertigo • computed tomograph • magnetic resonance imaging

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Background

Dermoid cysts are rare, benign, congenital ectodermal inclusion cysts that account for less than 1% of all intracranial lesions [1]. Symptoms are typically due to mass effect on adjacent intracranial structures. Rupture is a potentially serious complication that can lead to meningitis, seizures, cerebral ischemia and hydrocephalus [2]. Several causes, including spontaneous, iatrogenic or traumatic rupture, have been reported to result in dissemination of lipid material from the dermoid cysts into the subarachnoid space and/or ventricles [3]. Onset of symptoms typically does not occur at the time of rupture, because the effect of irritation caused by spilled contents requires time to develop and may occur from 3 months to 6.5 years after rupture [4].

This report describes a patient complaining of vertigo caused by spontaneous rupture of a dermoid cyst preoperatively diagnosed by computed tomography (CT) and magnetic resonance imaging (MRI).

Case Report

53-year-old woman was complaining of transient dizziness. The patient had no recent history of trauma or major surgery. No sensorimotor deficits or signs of increased intracranial tension were found on neurologic examination. No laboratory abnormalities were found. Cranial CT revealed a dense fatty lesion in the left posterolateral aspect of parasellar region with multiple small, dense fat droplets scattered in the subarachnoid space suggesting a ruptured dermoid cyst (Figure 1A, 1B). Non-enhanced, axial T1 weighted and coronal FLAIR cranial MRI sections showed a lesion with mixed-signal-intensity and multiple hyperintense droplets scattered through the left cerebellar surface (Figure 2A, 2B). No enhancement was found on axial T1-weighted MRI after intravenous Gadolinium administration (Figure 3). Diffusion weighted image (DWI) and an apparent diffusion coefficient (ADC) map studies indicated an explicit restricted diffusion. (Figure 4A, 4B). Following diagnostic procedures, the patient was transferred to the neurosurgery department.

Discussion

Dermoid cysts are usually observed in the second and third decades. They are extremely rare and represent slowly growing congenital ectodermal inclusion cysts [3,4]. Cyst location and size vary in each patient [3]. They are benign and tend to occur in the midline sellar, parasellar or frontonasal regions. They grow in subarachnoid space with minimal resistance, such as cisterns, sulci, or fissures [5]. These cysts increase in size by glandular secretion and epithelial desquamation. Presence of hair follicles and sebaceous or sweat gland helps distinguish dermoid cysts from the more common epidermoid cysts. Dermoids may become symptomatic due to rupture which results in spillage of contents

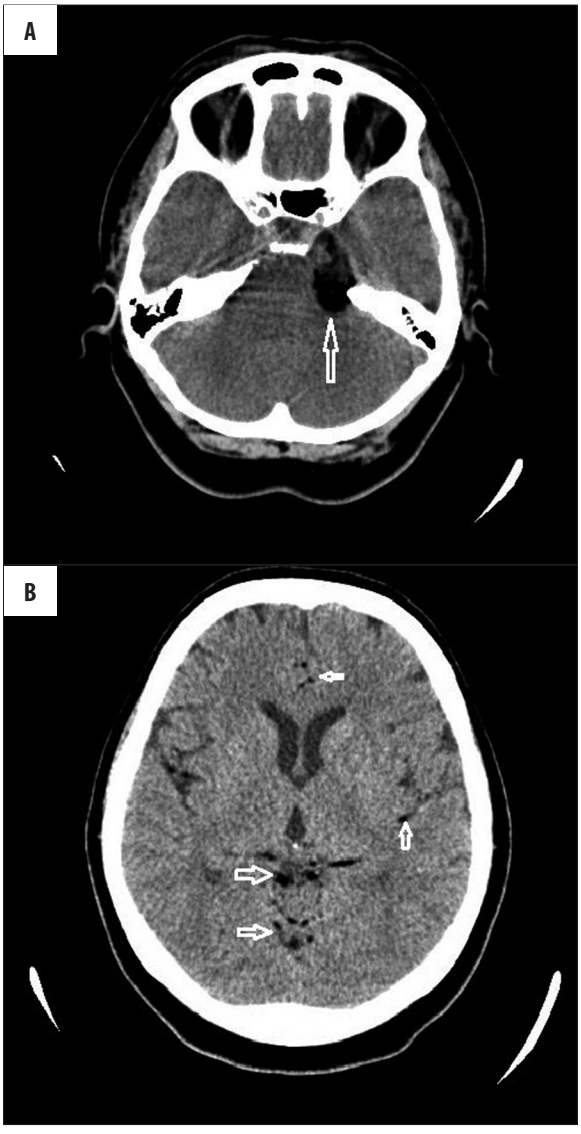

Figure 1. (**A**) Axial non-contrast CT revealed a dense fatty lesion adjacent to the posterolateral parasellar region on the left. (**B**) Multiple small fat density droplets scattered in the subarachnoid space suggesting rupture.

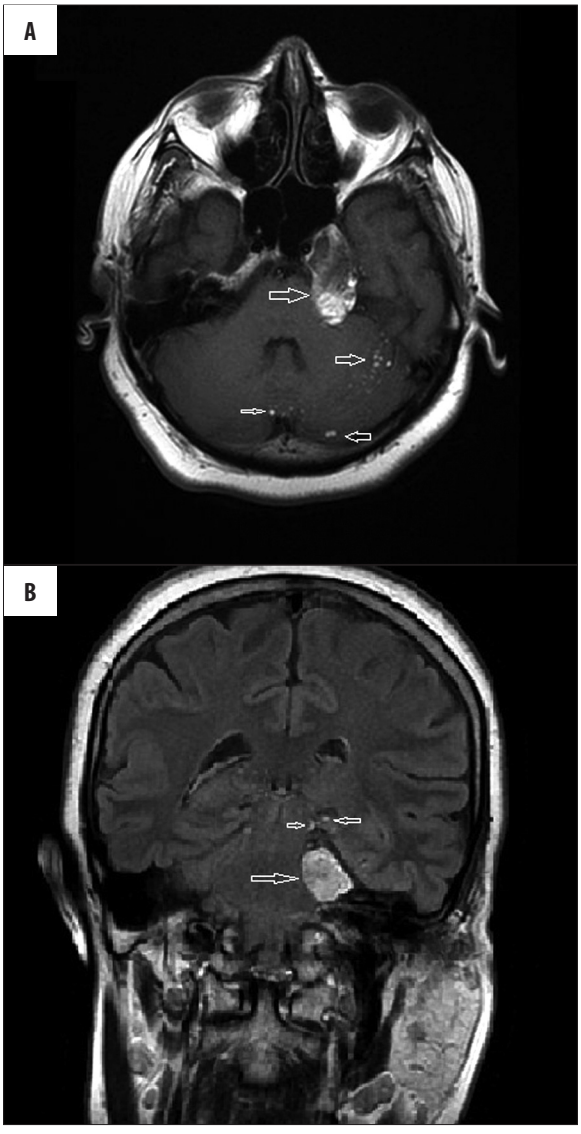

Figure 2. (**A,B**) Non-enhanced axial T1-weighted and coronal FLAIR MRI sections showing the lesion with mixed-signal-intensity and multiple hyperintense droplets scattered through the cerebellar surface on the left.

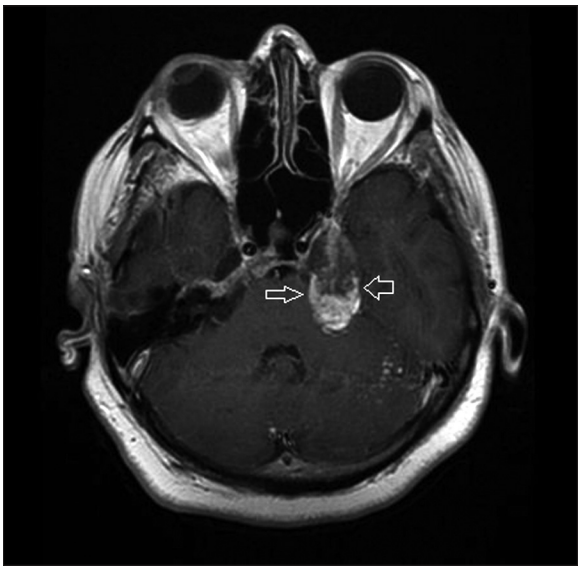

Figure 3. Axial Gadolinium-enhanced T1-weighted MRI showing no lesion enhancement.

into the subarachnoid space and the ventricles. This leads to aseptic chemical meningitis, vasospasm, infarction, or increased intracranial pressure [6–8]. Pathophysiology of spontaneous rupture is not clearly understood. Additionally, morbidity may be affected by chemical arachnoiditis [4]. Malignant transformation into squamous cell carcinoma has also been described [5].

Imaging specifications of intracranial dermoid cysts on cranial CT scans are nearly pathognomonic. These lesions have internal density characteristics due to presence of fat (Figure 1A). Dermoid cyst wall can be clearly observed and may calcify [4]. Dermoid cysts are hyperintense on T1-weighted images (Figure 2A) and do not enhance (Figure 3). The masses have heterogeneous signal intensity on T2-weighted MR images and vary from hypo- to- hyperintense [5]. When a dermoid cyst ruptures, fat droplets hypodense on CT (Figure 1B) or T1 hyperintense (Figure 2A) on MRI, may be seen scattered within the ventricular system and/or subarachnoid space [4]. In such cases, FLAIR is useful as it makes fat appear hyperintense (bright) on a background of suppressed fluid signal (dark) (Figure 2B) [9]. Dermoids are hyperintense according to brain parenchyma in DWI and demonstrate restricted diffusion on ADC map (Figure 4A, 4B) [6]. DWI hyperintensity in dermoids is related to a decrease of water proton diffusion and should be used for diagnosis of this lesion [9].

Intracranial dermoids are most commonly seen below the tentorium [8]. However; in this case the lesion was seen on a CT in the left parasellar region and extended toward the left cerebellopontine angle. Dermoid cysts in the cavernous sinus have seldomly been reported in the literature.

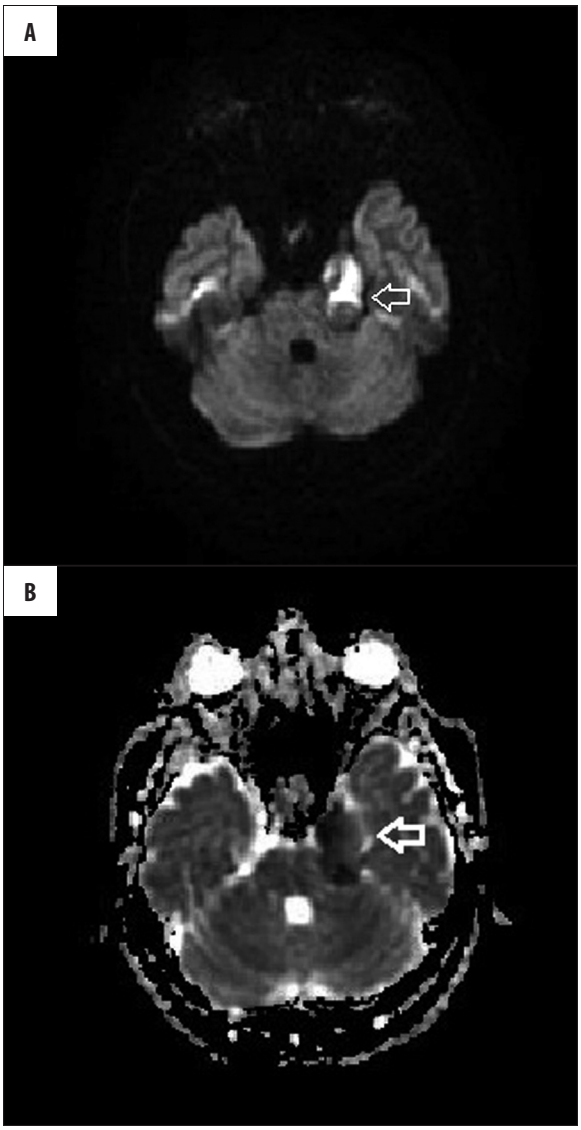

Figure 4. (**A,B**) Lesion was hyperintense in DWI and exhibited markedly restricted diffusion in ADC map.

Epilepsy is the most common presentation of supratentorial dermoid cysts [8,10]. Dermoid cysts can apply pressure to 7th and 8th nerve complex [10], in our opinion vertigo is the result of pressure exerted on these nerves.

Consequently, many studies and literature case reports concerning rupture of dermoid cysts have been reported. However, multimodality imaging of this rare pathology in the same patient is less. Although dermoid cysts are pathognomonic on a CT, MRI is also important in order to understand the effect of extension and pressure of the mass. DWI is also of importance for the diagnosis and patient follow-up.

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