Radiology Case Reports 13 (2018) 1133–1136

Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.elsevier.com/locate/radcr

Case Report

Atypical chronological changes on neuroimaging in the epidermoid in the frontal lobe with intracystic hemorrhage and tumor growth: Case report

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ARTICLE INFO

Article history:
Received 14 June 2018
Revised 9 July 2018
Accepted 16 July 2018

Keywords:
Epidermoid cyst
Intracystic hemorrhage
Atypical radiological findings

ABSTRACT

Intracranial epidermoids are rare lesions accounting for 0.2%-1.8% of all intracranial tumors. They commonly develop in the cerebellopontine angle and the parasellar region and can appear with atypical neuroimaging features due to intracystic hemorrhages which complicate diagnosis. The authors present a case of a 62-year-old woman with a frontal epidermoid cyst with a hemorrhage and tumor growth. A series of atypical radiological findings showed gradual changes in the lesion appearance that were confirmed with surgery and histopathology. To avoid surgical complications such as chemical meningitis, it is important to remember that epidermoid cysts occasionally bleed, leading to atypical MRI and/or CT findings and diagnostic difficulties. Development of epidermoid cysts in atypical locations in the brain may result in challenges to accurate diagnosis.

Introduction

Epidermoids are developmental benign lesions accounting for 0.2%-1.8% of all intracranial tumors, emerging at any life stage, with a median onset at age 40. Growth is linear, mainly at the cerebellopontine angle and parasellar region, and intradural locations may be associated with headaches, visual disturbances, hypothalamic alterations, or aseptic meningitis (caused by cystic rupture) [1–6]. Epidermoid cysts appear hypodense on computed tomography (CT) and do not accumulate contrast media [3]. On magnetic resonance

☆ **Conflicts of interest disclosure statement:** None.

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https://doi.org/10.1016/j.radcr.2018.07.022

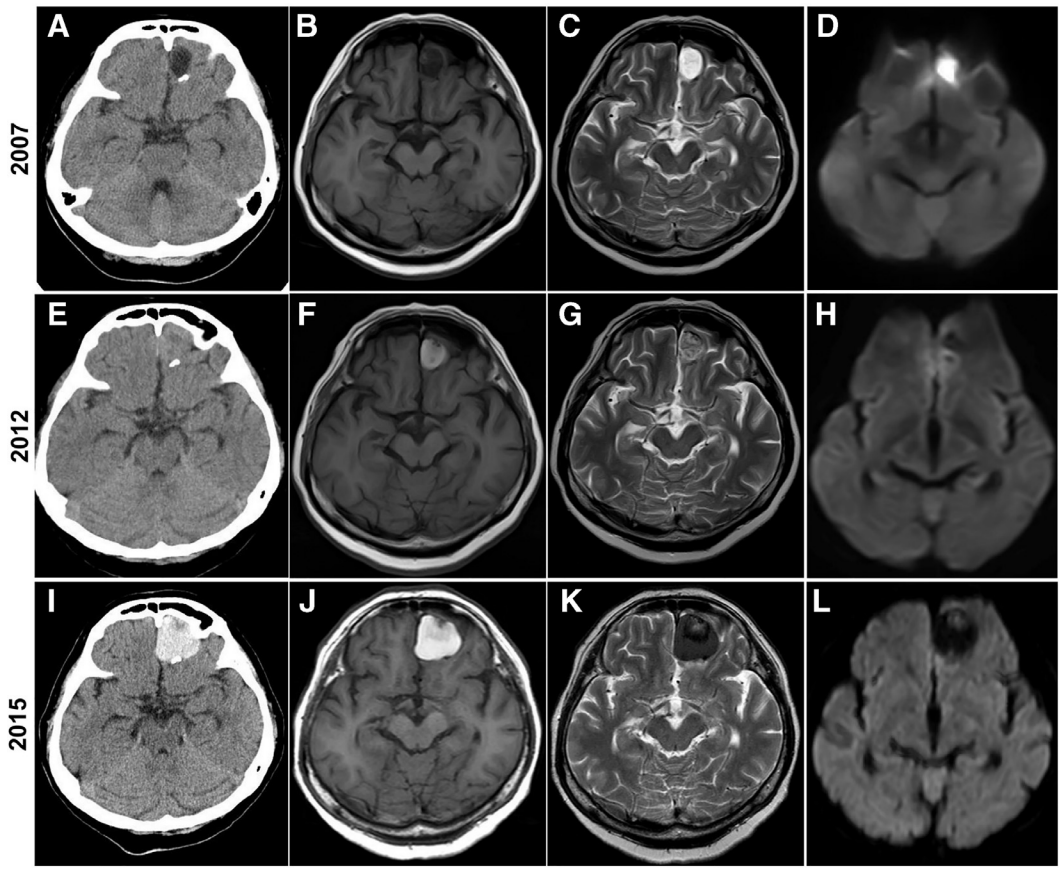

Fig. 1 – Initial and follow-up CT and MRI. May 2007: **Homogenously hypodense mass of 13 x 21 x 16 mm in the left frontal lobe with a focus of calcification on CT scan (A), low signal intensity on T1-weighted images (T1WI) (B), and high signal intensity on both T2-weighted images (T2WI) (C) and Diffusion-weighted imaging (DWI) (D).** November 2012: **Density change in the mass without significant size change on CT (E), high signal intensity on T1WI (F), and heterogeneously increased signal intensity on T2WI (G); indistinct on DWI (H).** November 2015: **Enlargement of the cyst with homogenously high density on CT (I), T1WI with increased signal (J) compared to the previous image (F), low signal intensity on T2WI (K), and DWI (L).**

imaging (MRI), they show low signal intensity on T1-weighted images (T1WI), high signal intensity on T2-weighted images (T2WI), and are not contrasted by gadolinium [3,4]. Diffusion-weighted imaging (DWI) enables greater accuracy in differentiating epidermoids [1,5,7,8]. In some cases, atypical findings on MRI can greatly complicate the diagnosis [8]. We report just such an occurrence; a rare intraparenchymal epidermoid cyst developed in the frontal lobe with atypical radiological findings.

Clinical case

A 62-year-old woman presented with tonic convulsions, but no other neurological symptoms were noted after the convulsions abated. CT demonstrated a hypodense mass of $13 \times 21 \times 16$ mm in the left frontal lobe with calcified foci (Fig. 1A) and the MR signal intensity of the lesion was lower than the grey matter on T1WI and higher on both T2WI and DWI (Fig. 1B-D). This unenhanced result on postcontrast MRI was indicative of an epidermoid cyst. The patient received an anticonvulsant and was followed up by serial imaging without surgical intervention. Five years later, the lesion size had not changed significantly but was isodense on CT scans (Fig. 1E). MRI showed a high-intensity signal on T1WI (Fig. 1F) and a heterogeneously increased signal on T2WI (Fig. 1G), though indistinct on DWI (Fig. 1H). Such changes suggested minor intracystic bleeding and further follow-up was without surgical intervention.

Three years later, the patient presented with a dull headache. The lesion had increased in size to $28 \times 32 \times 25$ mm with marked hyperdensity on CT scans (Fig. 1I), increased signal intensity on T1WI (Fig. 1J) compared to previous images, a heterogeneous, low intensity signal on T2WI (Fig. 1K), and low intensity on DWI (Fig.1L). These findings prompted surgical intervention.

A left frontal craniotomy was performed. The cortex incision revealed an encapsulated mass in the frontal lobe. After greenish-brown fluid was aspirated, the pearly white inner layer of the capsule and the sawdust-like mass were observed. The capsule was removed completely.