ECRONICON OPEN ACCESS

EC NEUROLOGY
Case Report

Intracranial Dermoid Cyst: A Rare CT Case Report with Radiological Insights

Ismail Neftah*, Fariss Dehayni, Ouiam Taibi, Hafsa Riache, Soukayna Jabour, Ittimade Nassar and Kaoutar Imrani

Department of Radiology, University of Mohammed V - Rabat, Morocco

***Corresponding Author:** Ismail Neftah, Department of Radiology, University of Mohammed V - Rabat, Morocco.

Received: August 18, 2025; **Published:** September 16, 2025

Abstract

The intracranial dermoid cyst is a rare congenital benign tumor resulting from ectodermal inclusion during embryonic development. Comprising less than 1% of all intracranial tumors, they most commonly occur along midline structures such as the posterior fossa, suprasellar region, and frontonasal junction. Histologically, they contain dermal elements including hair follicles, sebaceous glands, and keratinized epithelium, leading to the accumulation of fatty and proteinaceous debris. They are often asymptomatic, but can cause neurological symptoms.

Radiologically, dermoid cysts exhibit characteristic fat-density signals on CT and hyperintensity on T1-weighted MRI sequences, often with heterogeneous contents.

Early identification and intervention are essential to prevent complications, especially in cases of rupture. This review highlights the clinical, radiological, and surgical aspects of intracranial dermoid cysts, emphasizing the importance of differential diagnosis from other fat-containing intracranial lesions.

Keywords: *Dermoid Cysts; Intracranial; CT; Neuroimaging*

Introduction

Intracranial dermoid cysts are rare, benign, congenital lesions that account for less than 1% of all intracranial tumors. They arise from ectodermal inclusions during early embryogenesis, when ectodermal elements become trapped within the closing neural tube [15]. Histologically, these cysts are composed of well-differentiated ectodermal derivatives, including stratified squamous epithelium, sebaceous glands, hair follicles, and occasionally dental or other dermal structures, which result in the accumulation of lipid-rich material and keratinous debris within the cyst cavity [10].

These lesions typically localize along midline structures, with a predilection for the posterior fossa, parasellar region, and fourth ventricle [3]. Although many dermoid cysts remain clinically silent and are discovered incidentally, their potential to enlarge or rupture into the subarachnoid or ventricular space poses a significant clinical concern. Rupture may trigger an intense inflammatory reaction known as chemical meningitis, leading to headaches, seizures, hydrocephalus, and other neurologic deficits. Given their potentially serious complications, timely diagnosis using neuroimaging and appropriate neurosurgical management is essential for favorable outcomes [8].

Case Presentation

A 62-year-old diabetic patient admitted to the emergency department with headache, speech difficulties and right hemiplegia.

On clinical examination, the patient was apyretic, with a heart rate of 65 bpm, blood pressure of 170/80 mmHg and respiratory rate of 15 cpm. His systemic examination, including neurological examination, revealed headache, dysarthria and right hemiplegia. There was no evidence of meningeal irritation or cranial nerve damage. Initial laboratory tests were normal.

A cerebral CT scan was performed without and with PDC injection, showing a lesional process intra-axial, frontal left, heterogeneous, oval, well-bounded, with a predominantly fatty component, containing areas of hemorrhage and peripheral macro-calcifications, not enhancing after PDC injection, measuring 82x60x60 mm (APxTxH) (Figure 1 and 2).

The lesion exerts a mass effect on the ipsilateral lateral ventricle, causing a 16 mm midline shift to the right and resulting in subfalcine herniation.

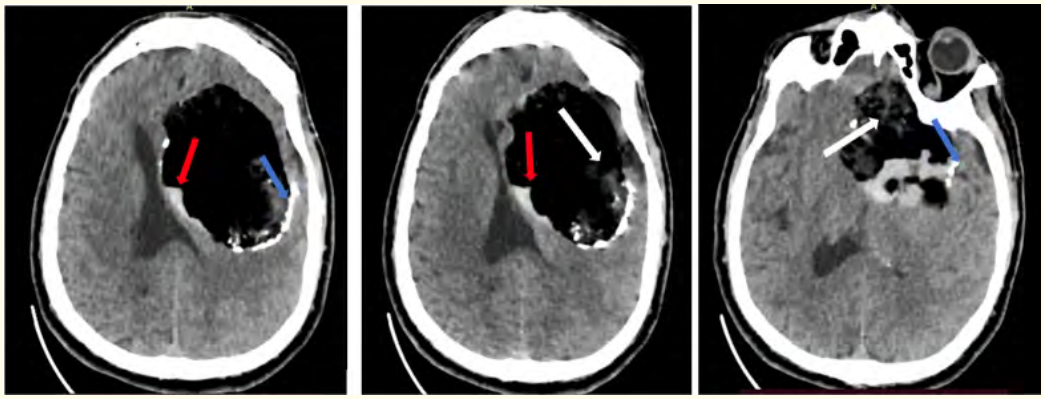

Figure 1: *Cerebral CT in axial section, without PDC injection, fatty component (white arrow), hemorrhagic area (red arrow), macro-calcifications (blue arrow).*

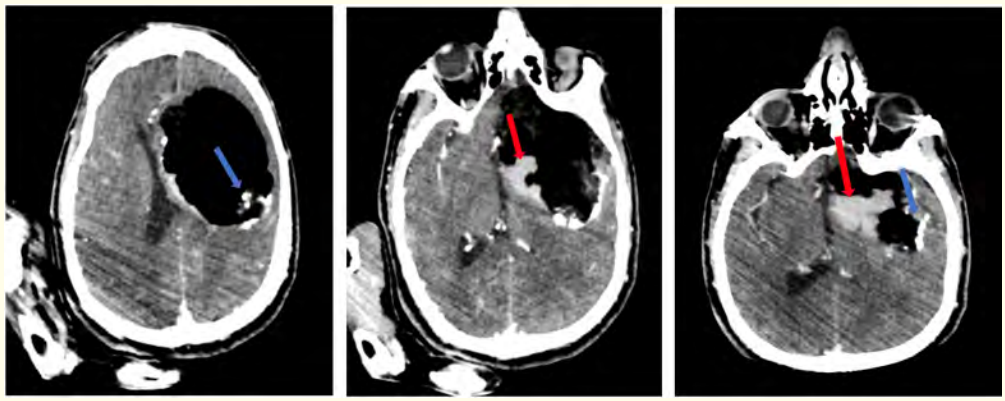

Figure 2: *Cerebral CT in axial section, with PDC injection, fatty component (white arrow), hemorrhagic zone (red arrow), macro-calcifications (blue arrow).*

The diagnosis of intracranial dermoid cyst was retained.

Two hours later, the patient developed altered consciousness, and was taken to the operating room by the neurosurgical team.

Surgical resection of the cyst and its wall was performed quickly, and the post-operative course was marked by good clinical improvement.

Discussion

Intracranial dermoid cysts formed from ectodermal remnants trapped during neural tube closure between the 3rd and 5th week of gestation. These cysts are most often located near medial structures such as the corpus callosum, the frontal midline, or the posterior fossa [1].

Intracranial dermoid cysts are rare, accounting for approximately 0.1-0.7% of all intracranial tumors [15].

These lesions are congenital, but clinical manifestation typically occurs between the second and fourth decades of life (mean age: 20-40 years), depending on cyst growth or rupture. However, they may present earlier in pediatric cases if symptomatic [12].

There is a slight male predominance, although some studies report a nearly equal sex distribution.

Common sites include: Suprasellar region, Posterior fossa, Fourth ventricle, Frontal midline [4,5].

Clinical presentation is variable, and may remain asymptomatic for a long time, manifesting as convulsive seizures, disturbances of consciousness, or focal signs depending on location: hemiparesis, visual disturbances. In the event of complications, such as compression, it may reveal signs of HTIC, and more rarely, reactional meningitis in the event of rupture of the cyst and release of its contents into the subarachnoid space.

Cerebral MRI is the reference examination for better characterization of the lesion process, presenting as an intra-axial, encapsulated, well-limited mass, with T1 and T2 hyper signal that fades after saturation in relation to its fatty component, with no contrast after gadolinium injection [2].

CT is the first-line examination, showing a hypodense, fat-dense intracranial mass, sometimes containing calcifications, with no enhancement after injection of PDCI. In the event of rupture, sub-arachnoid and intra-ventricular fatty formations may be seen [11].

Histological analysis reveals the presence of epidermal structures and skin appendages [6].

Intracranial dermoid cysts may be confused with several other intracranial lesions due to their radiological features, such as [7]:

- **Craniopharyngioma:** Typically arise in the sellar/suprasellar region. Often with three components: a solid part, enhanced after injection of contrast medium, a cystic zone hypo- or isointense in T1 and hyperintense in T2, and calcifications.
- **Epidermoid cyst:** Most frequent location in the cerebellopontine angle and subarachnoid spaces. Diffusion-restricted appearance on MRI, unlike dermoid cyst.
- **Intracranial lipoma:** Typical location in midline regions. Absence of wall or heterogeneous contents.
- **Cystic tumor (astrocytoma, oligodendroglioma):** Often presents a solid contrast-enhancing component. Possible signs of malignancy: significant mass effect, perilesional edema.

- **Cystic meningiomas:** Strongly attached to the dura mater. Intense enhancement of the solid portion after contrast injection. Homogeneous appearance, often with calcifications.
- **Arachnoid cyst:** Purely fluid content, isodense to cerebrospinal fluid on all MRI sequences. No lipid component or skin appendages. Typical location in subarachnoid spaces.
- **Intracranial abscess**: Ring-like enhancement after contrast injection. High diffusion restriction on MRI. Presence of systemic signs of infection (fever, leukocytosis).
- **Encysted intracranial hematoma:** Presence of hematic debris on MRI sequences. Progressive chronology with characteristic signal changes.
- **Porencephalic cavity:** Communication with the ventricular system. Homogeneous content corresponding to cerebrospinal fluid.

The management of intracranial dermoid cysts primarily depends on the cyst's size, location, symptomatology, and presence or risk of rupture. These lesions are benign and slow-growing, but due to the risk of mass effect, rupture, or chemical meningitis, timely intervention may be necessary [13,14].

- **Observation:** Small, asymptomatic dermoid cysts discovered incidentally may be managed conservatively with serial imaging (MRI preferred) to monitor for growth or signs of rupture.
- **Surgical resection:** Surgical resection is the treatment of choice for symptomatic dermoid cysts, particularly when associated with: Mass effect, Obstructive hydrocephalus, Visual disturbances, Rupture with chemical meningitis.
- **Emergency management:** In cases of rupture, patients may present with acute headaches, seizures, or aseptic (chemical) meningitis.
- **Postoperative follow-up:** MRI is used to monitor for recurrence, especially after subtotal resection. Long-term neurologic follow-up is necessary in patients with incomplete resection or prior rupture.

The prognosis is generally favorable after complete surgical resection. However, patients must be monitored over the long term to assess the risk of recurrence or the development of late complications [9].

Conclusion

Intracranial dermoid cysts are rare lesions but can pose significant clinical risks. The primary differential diagnosis includes craniopharyngioma. Early management based on accurate clinical and radiological diagnosis is essential to avoid complications and improve patient prognosis. Multidisciplinary collaboration between neurosurgeons, radiologists and neuropathologists is crucial in the management of these cases.

Ethics Approval

Our institution does not require ethical approval for reporting individual cases.

Patient Consent

Written informed consent was obtained from the patient for their anonymized information to be published in this article.

Bibliography

1. B Merrouchem., *et al*. "Kyste épidermoide intracranien extradural: à propos d'un cas et revue de la littérature". *Neurochirurgie* 66.4 (2020): 313.
2. Bouchakour M., *et al*. "Kystes dermoides et epidermoides cranio-cérébraux: A propos de 05 cas". *Journal de Neurochirurgie* 14 (2011): 9-12.
3. El Saqui A., *et al*. "Kyste épidermoïde du quatrième ventricule: à propos d'un cas Fourth ventricule epidermoid cyst: about a case". *Pan African Medical Journal* 26 (2017): 239.
4. Jaafar N., *et al*. "Dermoid cysts in the posterior fossa". *AJNS* 29.2 (2010).
5. Boukhari Mohamed. "Kyste dermoide cerebelleux avec sinus dermique occipital (A propos de 2 cas et revue de la littérature)". Université Hassan II, Faculté de Médecine et de Pharmacie, Casablanca (2006).
6. Mnari W., *et al*. "Aide au diagnostic des lésions kystiques intracraniennes". *Journal of Neuroradiology* 43.2 (2016): 120.
7. Oulali N., *et al*. "Kyste epidermoïde de la grande citerne et du quatrieme ventricule". *Pan African Medical Journal* 13 (2012): 19.
8. Mejdoubi M., *et al*. "Kyste épidermoïde intracrânien secondaire à la chirurgie d'une mucocèle: intracranial epidermoid cyst secondary to mucocele surgery". *Journal of Radiology* 90.2 (2009): 233-235.
9. Bertal A., *et al*. "Kyste épidermoïde intraorbitaire: a propos d'un cas". *Neurochirurgie* 53.5 (2007): 364-366.
10. Hila H., *et al*. "Kyste épidermoïde vermien révélé par un traumatisme crânien". *Neurochirurgie* 52.1 (2006): 63-66.
11. Megdiche Bazarbacha H., *et al*. "Kyste épidermoïde intracrânien spontanément hyperdense". *Journal of Neuroradiology* 31.2 (2004): 150-152.
12. Caldarelli M., *et al*. "Intra-axial dermoid/epidermoid tumors of the brainstem in children". *Surgical Neurology* 56.2 (2001): 97-105.
13. Lopes M., *et al*. "Prise en charge chirurgicale des kystes épidermoïdes intracrâniens: a propos de 44 patients et revue de la littérature". *Neurochirurgie* 48.1 (2002): 5-13.
14. Talacchi A., *et al*. "Assessment and surgical management of posterior fossa epidermoid tumors: report of 28 cases". *Neurosurgery* 42.2 (1998): 242-252.
15. Kaido T., *et al*. "Pathogenesis of intraparenchymal epidermoid cyst in the brain: a case report and review of the literature". *Surgical Neurology* 59.3 (2003): 211-216.

Volume 17 Issue 9 September 2025