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Case Report

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Dermoid cyst of the posterior cerebral fossa mimics vascular pathology: A case report and review of the literature

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Abstract

Background: Intracranial dermoid cysts are rare benign, slow-growing tumors derived from ectopic cell rests incorporated in the closing neural tube. Radiologically, dermoid cysts are typically hypodense on computed tomography and hyperintense on T1WI and hypointense on T2WI in Magnetic resonnance imaging.

Case description: We present a case of a 35-year-old female presented with chronic progressive headache, vomiting and blurred vision. Imaging studies revealed a spontaneously hyperdense mass lesion in the posterior fossa in CT scan; T1 WI hyperintensity and T2 hypointensity on MRI. Surgical excision of the tumor lesion was performed through a suboccipital craniotomy. The histopathological examination was typical for a dermoid cyst. The patient's symptoms resolved postoperatively.

Conclusion: Recognition of these atypical radiological features can help to avoid potential diagnosis and therapeutic pitfalls.

Keywords: Case report; Posterior fossa; Dermoid cyst.

Introduction

Intracranial dermoid tumors are rare congenital benign lesions of the brain that account for 0.3% of all intracranial tumors. They arise from ectopic cell rests incorporated in the closing neural tube during the third to fifth week of embryogenesis and typically occur in the midline. The clinical presentation of dermoids tumors is quite varaiable. The most common clinical symptoms is that of headache and seizures. Occasionnally, they are incidentally discovered on brain Computed Tomography (CT) or Magnetic Resonnance Imaging (MRI). Radiologically, on CT scans dermoid cysts are usually rounded, well-circumscribed, extremely hypodense lesions with a Hounsfield Unit of -20 to -140, in keeping their lipid content [1-3].

Herein, we present the case of a 35-year-old woman with posterior fossa dermoid cyst with atypical imaging features.

Case report

Patient information

A 35-year-old woman presented with 6 months history of progressively worsening headache, vomiting and blurred vision. Her past medical history was unremarkable.

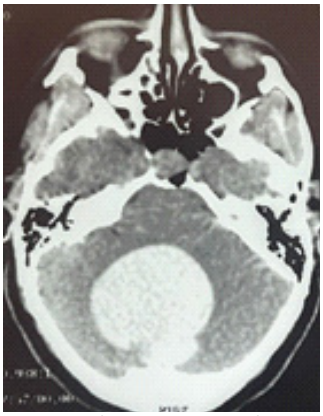

Figure 1: Head CT scan without contrast administration Brain window CT axia image showing a midline posterior fossa homogenously hyperdense lesion with an compression of the fourth ventricle.

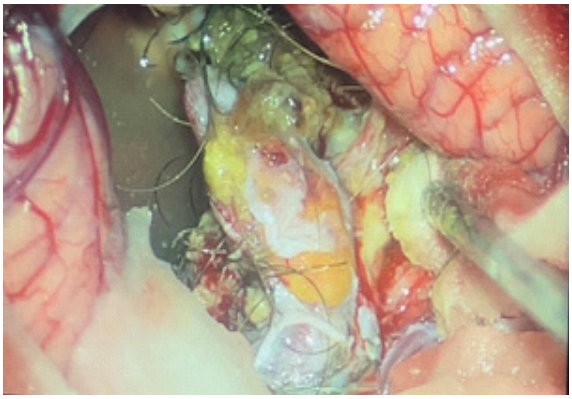

Figure 3: Intraoperative image of a triple-component process confirming a dermoid cyst. Histopathological examination revealed a dermoid cyst (Figure 4).

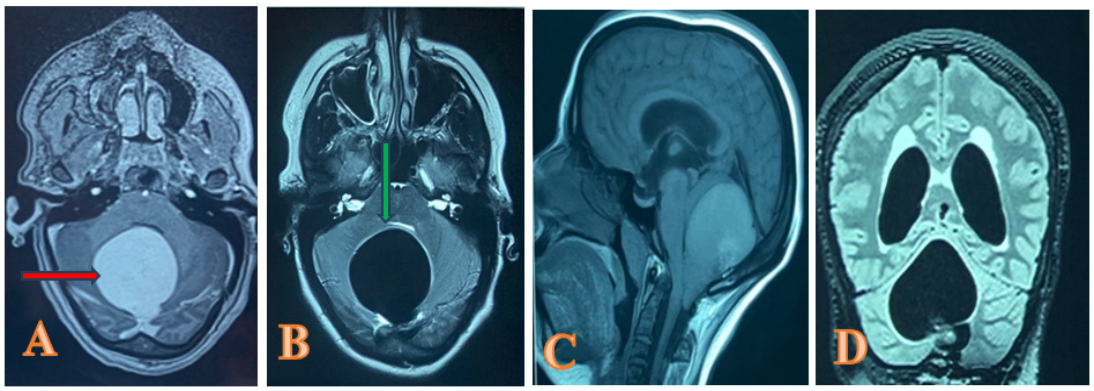

Figure 2: Brain MRI showing a well circumscribed lesion at the midline posterior fossa, which was hypointense on T2 weighted sequences (green allow) and hyperintense on T1 sequences (red allow), without frank contrast enhancement, **(A)** T1 weighted postcontrast axial image, **(B)** T2 weighted axial image, **(C)** T1 weighted sagittal image, **(D)** coronal FLAIR image.

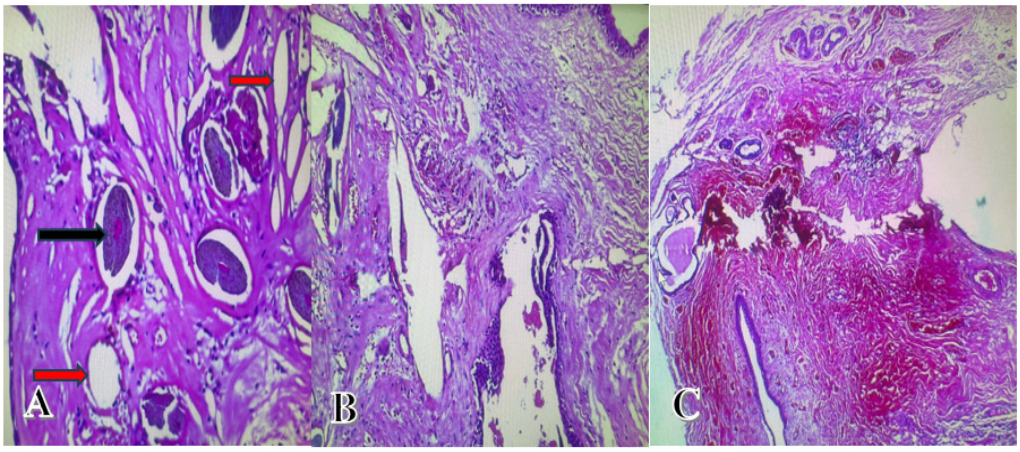

Figure 4: **(A):** H&E staining (hematoxylin and eosin) (200X) shows a cyst lined by a stratified squamous epithelium and containing sections of hair (black arrow), with cholesterol crystal deposition (red arrow).
(B): (100X) shows a cyst lined by a stratified squamous epithelium (double arrow).
(C): (200X) demonstrates stratified squamous epithelium (double arrow), with adnexal structures including hair follicles and sebaceous glands. (Arrowhead).

Clinical findings

At admission, the patient was conscious with Glasgow Coma Scale (GCS) of 15 with good general status. She had bilateral decreased visual acuity in both eyes (8/10) with moderate papilledema (grade 2). There was no focal neurological deficit.

Diagnosis assessment

Computed Tomography (CT) of the head with and without contrast was performed and demonstrated a 5.1×5 cm spontaneously hyperdense mass in the posterior fossa associated with obstructive triventricular hydrocephalus through compression of the fourth ventricle (Figure 1). Based on the CT findings, our differential diagnoses were giant nauerysm, hemorrage into a cerebellar hemangioma.

On MRI, the lesion appeared hyperintense on T1WI; hypointense on T2WI (Figure 2). She appeared avascular at digital substraction angiography. The blood laboratory test was normal.

There is associated mild supratentorial obstructive hydrocephalus.

Therapeutic intervention

A ventriculo-peritoneal shunt was placed to treat the obstructive hydrocephalus. She subsequently underwent a midline suboccipital craniotomy. On opening the dura, the lesion was entered immediately. The cyst contents were completely evacuated which consisted of hair, sebaceous and calcified material (Figure 3).

Follow up

Three weeks after operation, she was discharged without any cerebellar or general symptoms. A follow-up MR imaging examiantion at 8 months showed no recurrence of the lesion.

Discussion

Intracranial dermoid cyst is a congenital benign neoplasm that grows slowly as a result of progressive epithelial desquamation and gland secretion within the cyst that arises from inclusion of ectodermal elements within the neural tube during its closing between the third and fifth week of embryonic developement. it accounts for 0.1-0.7% of all intracranial tumors [4-6].

In our study, the patient presented worsening of his headaches without neurological deficits. The clinical symptoms are variable such as headaches , seizures,vomiting and neurological deficit. Dermoid cyst in the posterior fossa can decrease Cerebro-Spinal Fluid (CSF) drainage leading to symptoms of obstructive hydrocephalus. Our patient had compression of the fourth ventricle and obstructed CSF outflow. The imaging characteristics depend on their internal componement [1,2].

On imaging, they are characteristically well-defined lesions. The lipids componement gives it typical appearence, being mainly hypodense on CT (computed tomography); and on MRI showing hyperintensity on T1WI and heterogeneity or hyperintensity on T2WI. Dermoids cysts that are hyperdense on CT scan and hypointense on T2WI are extremely rare. To the best of our knowledge , only cases have been reported in the literature since 1992 to date [1,7], (Table 1). Pathologically this aspect could be explained by the high protein content of the necrotic tissue within the lesion; the hyposignal on T2WI by the saponification of lipid or keratinized debris with secondary microcalcifications [5,7,8].

The best optional treatment is complete surgical resection to decreases the risk of postoperative aseptic meningitis [5,8,10].

Conclusion

The reported case reveals an unusual imaging appearance of a dermoid cyst which posed a diagnostic challenge. Recognition of such radiologic features can help in formulating an appropriate differential diagnosis and avoid potential diagnostic and therapeutic pitfalls.

Table 1: Summary of findings from the previously reported posterior fossa's dermoid cyst with aypical imaging features.

Authors	Age	Sex	CT	MRI T1WI	MRI T2WI	Follow-up (months)	Outcomes
Danaila et al. [9] (1989)	37	F	Hyperdense	Low intensity	Low intensity	-	-
Drolshagen et al. [5] (1991)	54	F	Hyperdense	Low intensity	Low intensity	-	-
Bizzozero *et al*. [4] (1992)	20	F	Hyperdense	Low intensity	Low intensity	18	Favorable
Goh *et al*. [7] (1995)	19	F	Hyperdense	Low intensity	Low intensity	-	Favorable
Brown *et al*. [10] (2001)	18	F	Hyperdense	Hyper-intense	Low intensity	8	Favorable
Neugroschl *et al*. [8] (2002)	73	M	Hyperdense	Hyper-intense	Low intensity	-	-
Li et al. [6] (2011)	14	M	Hyperdense	Hyper-intense	Low intensity	-	Favorable
Geyik et al. [3] (2016)	12	M	Hyperdense	Hyper-intense	Hyper-intense	-	Favorable
Badri et al. [1] (2018)	35	F	Hyperdense	Low intensity	Hyper-intense	-	Favorable
Kumaran et al. [11] (2019)	36	F	Hyperdense	Low intensity	Low intensity	-	Favorable
Sathiaprabhu et al. **[12]**	26	M	Hyperdense	Low intensity	Hyper-intense	-	Favorable
Sathiaprabhu et al. [12] (2020)	37	M	Hyperdense	Hyper-intense	Low intensity	2	Favorable
Delgado-Munos et al. [2] (2022)	39	F	Hyperdense	Low intensity	Low intensity	-	Favorable
Our case (2022)	35	F	Hyperdense	Hyper-intense	Low intensity	8	Favorable

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