Radiology Case Reports 16 (2021) 2958–2961

Available online at www.sciencedirect.com

ScienceDirect

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

Case Report

Cystic meningioma: A case report with a literature review ☆

Mohamed Lahkim, PHC, PHD std, Professor Assistant, Author, Hajar Andour, Radiology resident, Fatima Zahrae Laamrani, PHC, PHD std, Assistant Professor, Hassan En Nouali, Professor, Jamal El Fenni, Professor*

Radiology department, Mohammed V - Military Hospital, Rabat, Morocco.

ARTICLE INFO

Article history:
Received 18 June 2021
Revised 5 July 2021
Accepted 6 July 2021
Available online 4 August 2021

Keywords:
Cystic
Meningioma
MRI
Histology

ABSTRACT

Cystic meningiomas are very rare tumors of the central nervous system. We report the case of a 62-year-old female how presented headaches resistant to usual analgesics with behavior disorders. Cerebral CT scan showed a right frontal extra-axial tumor with firm and cystic component, brain MRI evoked the diagnosis, surgery removed the entire tumor and histological examination confirmed it. A cystic meningioma should not be omitted from the differential diagnosis of brain tumors with a cystic component and which clinical, radiological, histological and therapeutic features are discussed.

Introduction

Meningiomas are the most common tumors of the central nervous system. However, the cystic form is very rare with an incidence less than 10% and can be confused with other tumors. Brain MRI is effective for preoperative diagnosis, with some typical radiologic aspects, but of a specificity not exceeding 80% [1]. There are different classifications; radiological depending on relationship between firm and cystic component then anatomopathological defining malignancy degree with a more frequent benign grade I.

Case presentation

A 62-year-old female with no medical history, presented 3 months' ago headaches resistant to usual analgesics with behavior disorders. Symptoms worsened with an onset of vomiting, without sensory-motor deficit or seizures. Neurological examination revealed an isolated frontal syndrome.

The cerebral CT scan showed a voluminous intracranial mass, of a right frontal extra-axial seat, well limited, widely in contact with the cranial vault, of a heterogeneous density with a double fleshy and cystic component associated to a perilesional edema and a large mass effect on the mid-

☆ Competing Interests: Authors declare having no conflict of interest.

* Corresponding author.
E-mail address: lahkim7875@yahoo.fr (M. Lahkim).

https://doi.org/10.1016/j.radcr.2021.07.016

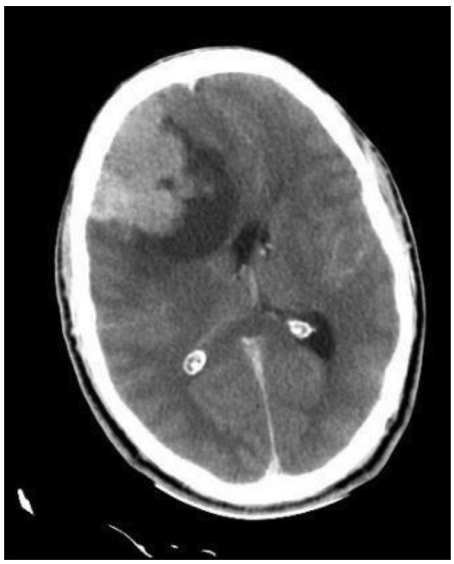

Fig. 1 – An axial cerebral preoperatory CT-scan showing a right frontal extra-axial expansive process, roughly oval, largely in contact with the vault, of heterogeneous density with double component; a hyperdense fleshy portion intensely enhanced at contrast and a cystic portion. Note the perilesional edema with the mass effect on adjacent structures and the subfalcine herniation.

line (Fig. 1). To better characterize this process a brain MRI was performed. It showed an infiltration of the bone beside the process with an intensely enhanced firm portion after Gadolinium injection and a hypersignal of the fluid component on T2 weighted sequences; as well as a perilesional cerebral edema and a subfalcine herniation (Figs. 2A and B). The diagnosis of a meningioma was raised without certainty at the view of the cyst. Other pathological processes were suspected, but the extra-axial seat with the dural attach did that a cystic meningioma be the most suggestive one.

Neurosurgical management was chosen, and a total excision of the tumor with its wall was performed. The postoperative outcome was quickly favorable with the cessation of vomiting and the disappearance of headaches. Histological examination showed meningothelial cell ranges with oval nuclei and fine chromatin surrounded by fibrous tissue diagnosed as a WHO grade I meningothelial meningioma (Figs. 3A and B). The control CT-scan showed only a residual cavity (Fig. 4). The postoperative follow-up currently of 2 years is still favorable.

Discussion

Cystic meningioma is an unusual histological variety of intracranial tumors. It is more frequent on children, representing 12%-24% of their meningiomas while it's only of 2%-4% on adult [2]. It occurs between 30-and 60 years old, twice more on female probably due to hormonal factors. Its pathogenesis remains unknown; several factors were involved in the formation of the cyst as tumor necrosis, cystic degenerescence or intratumoral bleeding [2,3].

Cystic meningioma can occur in all cerebral locations but the most frequent are those of the convexity and the parasagittal region [4]. Symptoms are of a wide variety depending mainly on the site of the tumor but their clinical expression is generally shorter than in firm tumors due to cyst development.

CT interpretation of cystic form is more difficult, arises less than 40% preoperatively unlike the solid form where it has a sensibility of 100% and a specify of 90%. It can be confused with other tumors like gliomas, hemangioblastomas and metastases. The leading radiological features allowing the differentiation of those entities is the axtra-axial seat, the intense enhancement of the firm portion in contrast, the dural attach, a key of diagnosis, well identified on enhanced T1-weighted sequences at brain MRI. It is highly efficient and sensitive up to 80%, by showing that characteristic dural attachment, the interface cyst-tumor and the normal brain parenchyma. Nauta and al [5] classify these tumors according to the location of the cyst relative to the tumor into 4 types. Type I is a meningioma where intratumoral cyst is central, type II where the cyst is intratumoral but peripheral, type III

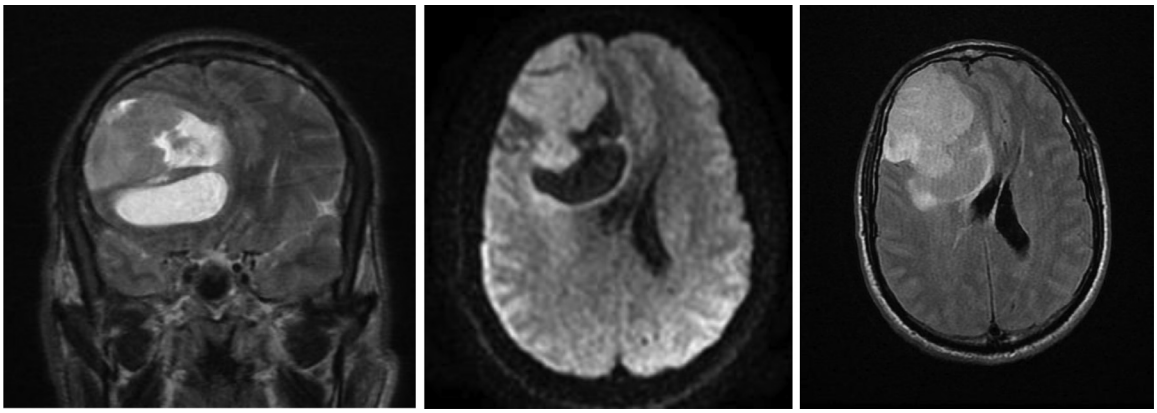

Fig. 2 – (A,B,C): Brain MRI in coronal T2-weighted (A), axial T1-weighted image with Gadolinium injection (B) and B1000 diffusion sequence (C) showing a large right frontal mass, heterogeneous with a firm portion in isosignal T2 and a cystic portion in hyposignal T1 and hypersignal T2. Note the mass effect on adjacent structures and subfalcine herniation.

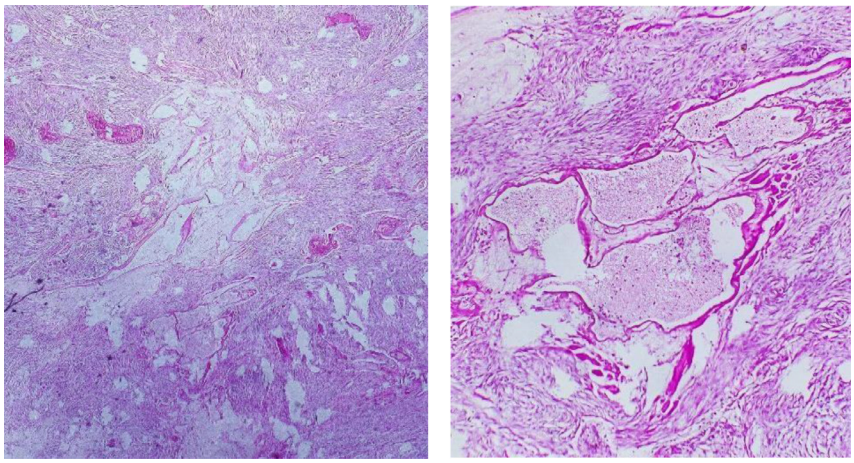

Fig. 3 – (A,B): Hematoxylin and Eosin (H&E) Stain, original magnification x100 (A) and x200 (B). The microscopic examination shows a tumor proliferation made up of spindle-shaped elements forming vortices intertwined with a collagenous web associated with hollowed areas of cystic cavities. Note the presence of a few rare dystrophic cells with a large hyperchromatic nucleus.

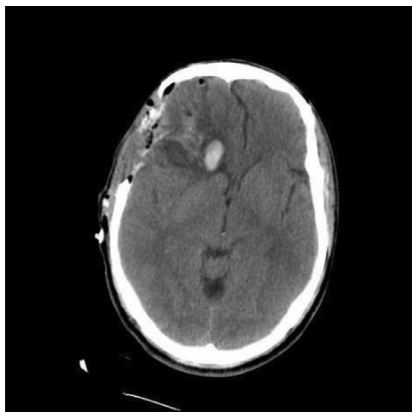

Fig. 4 – Postoperatory axial cerebral CT-scan image brain window objecting a residual right frontal cavity after complete tumor resection with a hematoma at the intervention seat.

with a peritumoral cyst in adjacent brain parenchyma and in type IV the cyst is peritumoral between the tumor and the adjacent parenchyma.

Histologically, these tumors are of an extreme microscopic diversity. There were many trials to classify them, the most recent of which is the WHO classification of 2000 [6]. It includes 3 grades of increasing aggressivity. Grade I, being begnin and the most frequent, is characterized by elongated cells forming a lobular architecture organized in whorls, surrounded by fibrous tissue with weak mitoses and possible pleomorphic nuclei. It has 9 subtypes depending on the architectural layout. Meningothelial, fibroblastic and transitional subtypes are by far the most common. Our case corresponds to a WHO grade I meningothelial cystic meningioma.

Meningioma prognosis and therapeutic management depend on several factors such as histological type, location, age and associated comorbidities. Total excision of the cyst and its wall is a major recommendation to prevent and minimize the risk of recurrence.

Conclusion

Cystic meningiomas are rare tumors classified in 4 types according to the location of the cyst in relation to the firm portion. They can be confused with other intracranial processes, but there are some main radiological features distinguishing them. Although brain MRI effectiveness, anatomopathological examination remains the only tool to provide a certain diagnosis, allowing the correct management which should privilege a total resection as much as possible.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.radcr.2021.07.016.

REFERENCES

[1] Go K, Lee K, Heo W, Lee YS, Park Y-S, Kim SK, et al. Cystic meningiomas: correlation between radiologic and histopathologic features. Brain Tumor Res Treat 2018;6(1):13.
[2] Artico M, Ferrante L, Cervoni L, Colonnese C, Fortuna A. Pediatric cystic meningioma: report of three cases. Child's Nerv Syst Mars 1995;11(3):137–40.
[3] Sindou M, Wydh E, Jouanneau E, Nebbal M, Lieutaud T. Long-term follow-up of menin- giomas of the cavernous sinus after surgical treatment alone. JNS 2007;107(5):937–44.
[4] Dietemann J-L, Abu Eid M, Mourao Soares I, Bogorin A, Boyer P, Draghici S. Tumeurs cranioencéphaliques : tumeurs

extra-axiales. In: Neuro-Imagerie Diagnostique. Elsevier; 2018. [Internet]Accessed at: December 1, 2020 Accessed from https://linkinghub.else-vier.com/retrieve/pii/B9782294753947000084 .

[5] Weber J, Gassel AM, Hoch A, Kilisek L, Spring A. Intraoperative management of cystic meningiomas. Neurosurg Rev Janv 2003;26(1):62–6.

[6] DN L, H O, OD W, WK C. WHO Classification of Tumours of the Central Nervous System; 2007. Accessed at: December 1, 2020 Accessed from https://publications.iarc.fr/Book-And-Report-Series/Who-Classification-Of-Tumours/WHO-Classification-Of-Tumours-Of-The-Central-Nervous-System .