Scientific Research Publishing

Open Journal of Modern Neurosurgery, 2023, 13, 175-182
https://www.scirp.org/journal/ojmn
ISSN Online: 2163-0585
ISSN Print: 2163-0569

Metastases Extracranial Mimicking Meningioma: A Case Report

Dimbi José Makoso[1,2*], Touati Lina[1,2], Mouné Michel Yolande[1,2], Djimrabeye Alngar[1,2], Moussa Elmi Saad[1,2], Nizaire El Fatemi[1,2], Rachid El Maaqili[1,2]

[1]Department of Neurosurgery, Center Hospital University of IBN SINA, Rabat, Morocco
[2]Faculty of Medicine, University of Mohamed V, Rabat, Morocco
Email: *dimbijose@gmail.com, linatt234@gmail.com, djimrabeye@gmail.com, saad.elmi@yahoo.com, mounemichele22@gmail.com, nizareelfatemi@gmail.com, rachidelmaaqili@hotmail.com

How to cite this paper: Makoso, D.J., Lina, T., Yolande, M.M., Alngar, D., Saad, M.E., El Fatemi, N. and El Maaqili, R. (2023) Metastases Extracranial Mimicking Meningioma: A Case Report. *Open Journal of Modern Neurosurgery*, **13**, 175-182.
https://doi.org/10.4236/ojmn.2023.134021

Received: April 22, 2023
Accepted: October 15, 2023
Published: October 18, 2023

Abstract

Background: Skull vault lesions are rare and represent 1% - 2% of all bone masses. Most cerebral metastases are the intra axial tumors, whereas extra-axial masses mimicking meningioma are extremely rare. Case presentation: A 35-year-old woman with a history of mastectomy left breast cancer 5 years below radiotherapy was referred to the neurosurgery department with a parietal extra-axial mass parietal evolving for one year. CT scan with Magnetic resonance imaging revealed an extra-axial tumor with lysis bone. A craniotomy was performed to remove the mass that was located extra-axial. Histopathological examination revealed metastasis. Conclusions: Lesion skull vaults are rare but they should be considered in the differential diagnosis of intraosseous meningioma lesions. In this report, we discuss the clinical aspects of cases we observed, in which the metastasis bone was found thanks to the histological examination of a calvarial mass after surgery.

Keywords

Metastases, Calvarial, Meningioma, Exerese

1. Background

Lesions of the skull vault are rare and most often of incidental discovery due to many CT scans to MRIs performed daily. Most lesions of the cranial vault are bone metastases and myeloma. These metastases to the vault of the skull are secondary in decreasing order of frequency to cancers of the breast, lung, prostate, kidney, and thyroid in adults and neuroblastomas or sarcomas in adults, and children. Metastases from extracranial primary neoplasms are the most

common skull tumors, in 60% of cases originating from carcinomas of the breast and lung [1]. Breast cancers cause nearly half of the metastases to the cranial vault, hence their female predominance [2]. These lesions frequently diagnosed within the framework of a neoplastic context, are generally asymptomatic or revealed by sometimes painful swelling. They are sometimes the first manifestation of unknown cancer or the first sign of neoplasia recurrence [2]. They develop immediately from the cranial vault, evoking hematogenous dissemination, or by secondary extension from the dura mater. CT scan and/or MRI commonly follow. CT scan is ideal for detecting bone lysis and sclerosis, determining the involvement of each of the two skull tables and the diploë, and is helpful in precisely localizing and delineating a lesion pre-surgically [3]. Differential diagnosis is with multiple myeloma, other skull lesions, postsurgical, or post-traumatic defects. The nature and the clinical course of the primary tumor dictate treatment and prognosis. We want to report one patient with a proven bone metastatic breast to the brain. It was an extra-axial mass in a radiologic feature mimicking meningioma.

2. Case Report

2.1. Clinical Presentation

A 35-year-old woman with a history of left breast mastectomy followed for radiotherapy with good evolution 5 years ago was admitted to the neurosurgery department for intermittent progressive headaches with painless enlarging mass in the occipital region without vomiting or seizures. Her neurological condition was negative, and her general physical examination revealed a mass bony, hard, middle in the occipital parietal region. The mass had ill-defined margins with an irregular surface, fixed with overlying skin and underlying structures. There was no palpable lymphadenopathy or swelling elsewhere in the body.

2.2. Diagnostic Assessment

A CT scan (**Figure 1**) and Brain MRI (**Figure 2** and **Figure 3**) showed a central tumor mass measuring 46 × 23 × 63 (T × AP × H) on the left parietal bone with meningeal invasion enhanced by the contrast lysis of external and internal tables. Because of the possibility of metastasis to bone, a bone scan was performed. A mammogram and ultrasound were normal classified BI-RADS 1. Additional bone scintigraphy showed an anomaly of cranial fixation of secondary appearance for the rest nothing in particular.

2.3. Management

The tumor was exposed through an incision and subgaleal dissection. The mass presented diffuse infiltration of subcutaneous tissue. After meticulous dissection, the flap was retracted Antero-inferiorly (**Figures 4-6**). A craniectomy was performed, bone was eroded and its intracranial counterpart was identified. The tumor showed both extracranial and no intracranial extension, Dura mater and

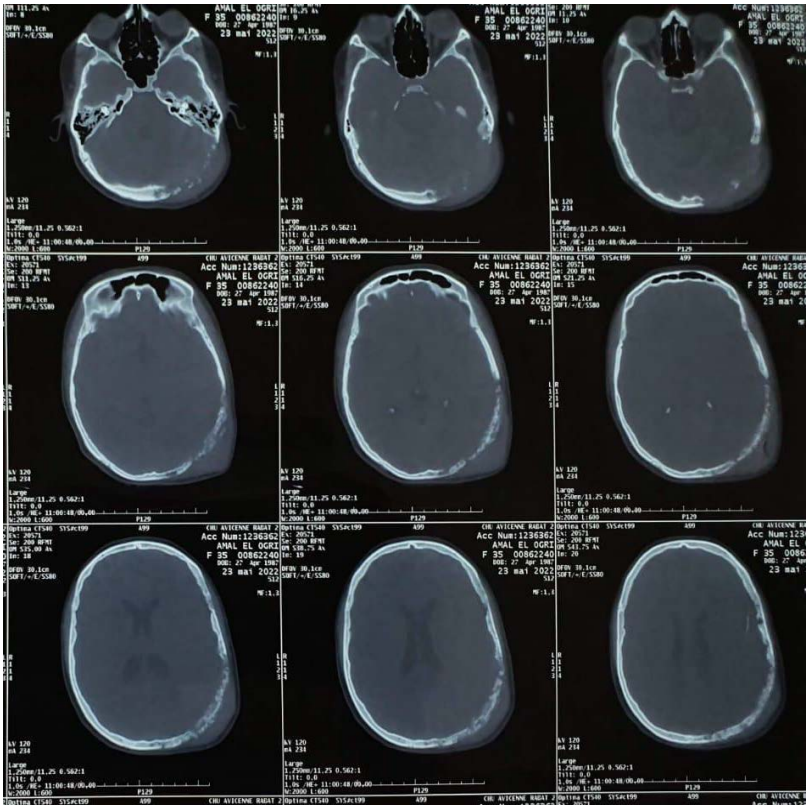


Figure 1. Axial CT shows osteolysis and well-circumscribed lesions invading inner and outer tables and extending into adjacent soft tissue.

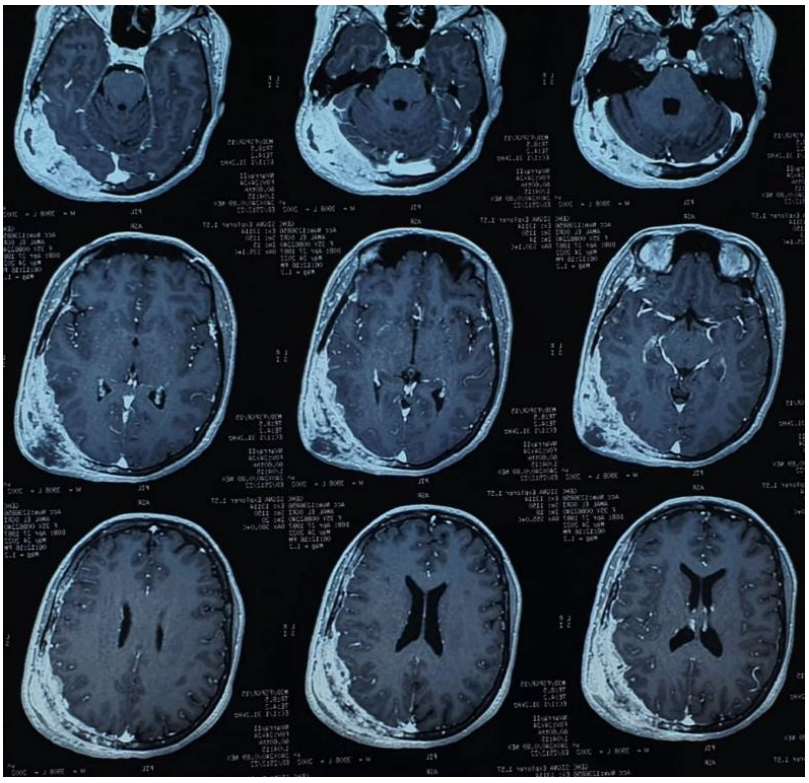


Figure 2. Axial gadolinium-enhanced T1 MR image.

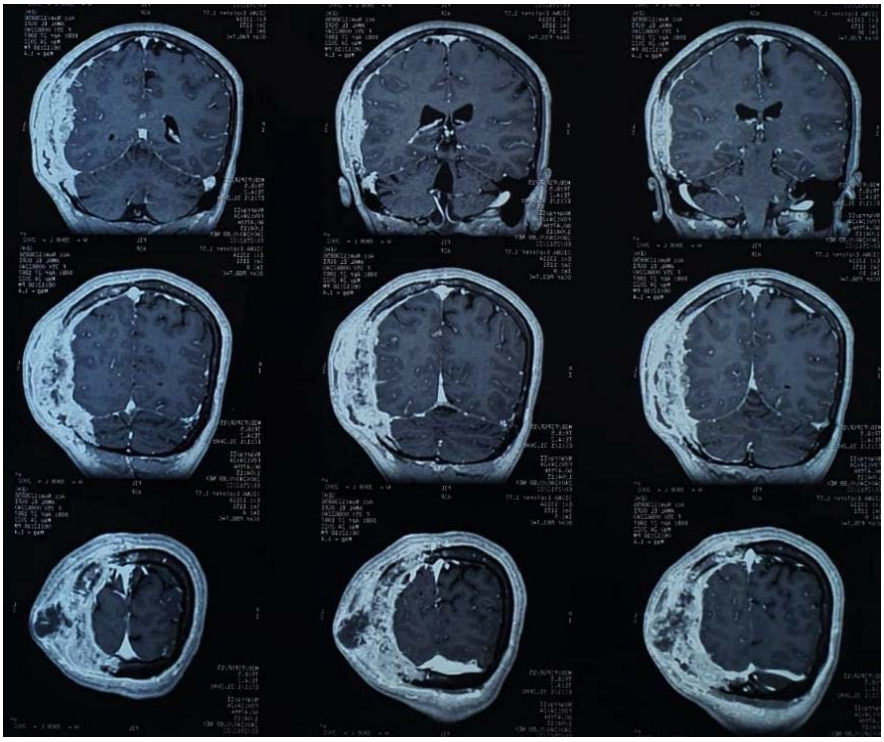
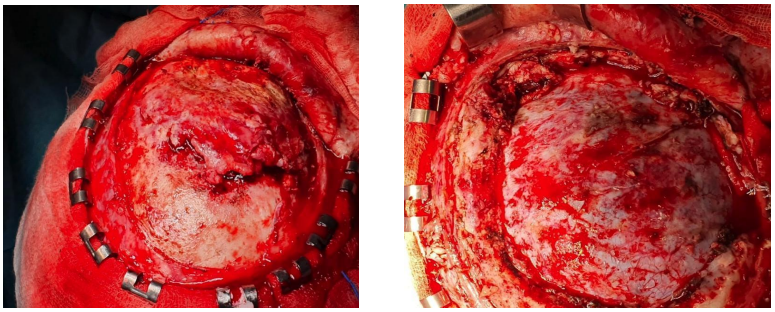


Figure 3. MRI viewed coronal T1 gadolinium as an extra-axial lesion with heterogeneous contrast dural enhancement sus sous tentorial with the tail dural extending into adjacent soft tissue.

Figure 4. View of the swelling of the occipital parietal scalp with the outline of the approach.



(a) (b)

Figure 5. (a) view operative of the party necrotic and friable parietal bone; (b) view of the dura mater after craniectomy with lost bone down to the viable bone margins.

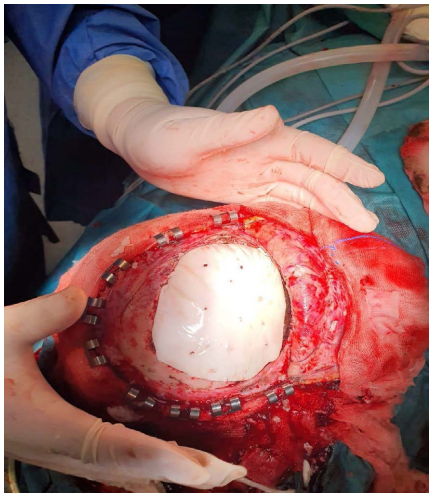


Figure 6. Operative view of cranioplasty to fill the bone defect.

cortex was not involved. When surgery was performed, the craniotomy showed a highly vascularized lesion irrorated by branches of the middle meningeal artery. Surgical resection of the bone tumor was accomplished after careful hemostasis with a patch followed by cranioplasty.

2.4. Outcomes

Histological examination showed a malignant carcinoma characterized by a solid rest of atypical clear cells referred to as metastases from a primitive renal cell carcinoma. The diagnosis was confirmed by the characteristic immunoreactivity of tumor cells. Careful histologic examination demonstrated that the specimen was almost a total necrotic tumor with focally atypical cells suggesting thymic carcinoma. The patient received adjuvant chemotherapy with a BEP regimen (bleomycin, etoposide, and cisplatin). The patient's postoperative course was uneventful except for radiation pneumonitis, which was controlled with dexamethasone or prednisolone. There was no onset of new neurological deficits during follow-up. She was clinically stable at 6 months' follow-up.

3. Discussion

The calvarium is one of the most frequent target sites of involvement for common and uncommon malignant neoplasms in adults, *i.e.* breast and lung cancer, lymphoma, paraganglioma, pheochromocytoma, Merckel tumor, etc [2] [4]. The prevalence of skull metastases is higher during the sixth and seventh decades of life. The majority of metastatic lesions appear as lytic, usually solitary, and destroy either the inner or the outer table of the skull with invasion of the intra- or extracranial tissues. The most notable differential diagnostic consideration was metastatic breast carcinoma or malignant meningioma. From a clinical standpoint, they can be asymptomatic and diagnosed in the context of the staging of a known primary tumor, while less open they are the initial manifestation of an

unknown malignancy. The most common symptoms are symptomatic, painless, or painful swelling and headache [5] [6]. Once calvarial metastases invade the dura and intradural space, patients suffer from increased intracranial pressure, meningeal irritation, and focal neurological signs. The normal pattern of fat distribution in the diploic space and marrow of the skull base was symmetric. Gross asymmetry of the diploic space alone is highly suggestive of calvarial disease on pre-contrast and post-contrast images. MRI using T2 and T1-weighted sequences before and after intravenous gadolinium administration is the best way to detect skull metastases. Fat suppression in combination with gadolinium infusion is particularly important. CT scan with bone windows is a useful method to show whether the lesions appear as osteolytic areas or osteoblastic lesions [6]. However, a CT scan does not clearly show boundaries and degrees of dural invasion by bone metastasis. It has a poorer spatial resolution for concomitant brain metastasis than MRI. It is more sensitive than CT for the depiction of dural invasion ("dural tail" sign) of associated intraparenchymal metastases. Some authors advise the treatment first of the optimal lesion and only after metastasis treatment. Treatment and prognosis (Karnofsky Performance Status and neurological status) are dictated by the histotype and the clinical course of the primary tumor. Indications for surgical treatment are decompression of neurovascular structures, painful lesions, extensive infiltration of surrounding tissues and dura, and obtaining tissue for histology [6] [7]. Conventional fractionated radiation therapy remains the primary treatment. Radiosurgery can provide reasonable tumor control in selected cases, while bisphosphonates can be used to treat painful lesions [8]. Vikram and Chu reported that radiation had better effects for patients presenting with symptoms of short duration; the response rate was 87% for patients with less than 1-month history, 69% for patients with 1 - 3 months history, however, 25% for those with >3 months history [9]. Radiosurgery provides reasonable tumor control, with side effects comparable to standard radiation therapy. This merits careful coordination between surgeons and pathologists in cases where tumor-to-tumor metastasis is possible, given its potential implications for patient prognosis and subsequent management.

4. Conclusion

Patients presenting with metastasis extra-axial are often in an advanced stage of breast cancer, although surgery can relieve symptoms quickly and effectively with low morbidity. In particular, patients with signs of dura infiltration and related neurologic deficits should be offered neurosurgical therapy. Going forward, it will be important to define the prognostic impact and optimal management approach for meningioma patients who are discovered to have this superimposed lesion.

Acknowledgements

Special thanks to the medical team and patients.

Abbreviations

CT: Computed Tomography; MRI: resonance magnetic

Author contributions

The authors described their own experience and all authors read and approved the final manuscript.

Declarations

Ethics approval and consent to participate

This case report does not require any ethics committee approval.

Consent has been obtained by the patient.

Authors' Contributions

Dimbi José Makoso: Conceptualisation, Writing original draft and editing.

Touati lina: Conceptualisation, Writing original draft-editing.

Djimrabeye Alingar: Conceptualisation, Writing original draft-editing.

Moussa Saad: Conceptualisation, Writing original draft-editing.

Mouné Yolande: Writing original draft-editing, Review-Editing.

Nizare El Fatemi: Supervision, Validation.

Rachid El Maaqili: Supervision, Validation.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

[1] Colas, L., Caron, S. and Cotten, A. (2015) Skull Vault Lesions: A Review. *American Journal of Roentgenology*, **205**, 840-847. https://doi.org/10.2214/AJR.14.13415

[2] Gaetani, P., Di Ieva, A., Colombo, P., Tancioni, F., Aimar, E., Debernardi, A., *et al.* (2005) Calvarial Metastases as Clinical Presentation of Renal Cell Carcinoma: Report of Two Cases and Literature Review. *Clinical Neurology and Neurosurgery*, **107**, 329-333. https://doi.org/10.1016/j.clineuro.2004.07.017

[3] Garfinkle, J., Melançon, D., Cortes, M. and Tampieri, D. (2011) Imaging Pattern of Calvarial Lesions in Adults. *Skeletal Radiology*, **40**, 1261-1273. https://doi.org/10.1007/s00256-010-0971-8

[4] Greenberg, H.S., Deck, M.D.F., Vikram, B., Chu, F.C.H. and Posner, J.B. (1981) Metastasis to the Base of the Skull Clinical Findings in 43 Patients. *Neurology*, **31**, 30-530. https://doi.org/10.1212/WNL.31.5.530

[5] Healy, J.F., Marshall, W.H., Brahme, F.J. and White, F. (1981) CT of Intracranial Metastases with Skull and Scalp Involvement. *American Journal of Neuroradiology*, **2**, 335-338.

[6] Mitsuya, K., Nakasu, Y., Horiguchi, S., Harada, H., Nishimura, T., Yuen, S., *et al.* (2011) Metastatic Skull Tumors: MRI Features and a New Conventional Classification. *Journal of Neuro-Oncology*, **104**, 239-245. https://doi.org/10.1007/s11060-010-0465-5

[7] Stark, A.M., Eichmann, T. and Mehdorn, H.M. (2003) Skull Metastases: Clinical Features, Differential Diagnosis, and Literature Review. *Surgical Neurology*, **60**, 219-225. https://doi.org/10.1016/S0090-3019(03)00269-6

[8] Tarantino, R., Rocco, P., Cappelletti, M. and Delfini, R. (2010) Neurosurgical Department, Policlinico "Umberto I", "La Sapienza" University, Rome.

[9] Vikram, B. and Chu, F.C.H. (1979) Radiation Therapy for Metastases to the Base of the Skull. *Radiology*, **130**, 465-468. https://doi.org/10.1148/130.2.465