ECRONICON OPEN ACCESS

EC CLINICAL AND MEDICAL CASE REPORTS

Mini Case Study

When Breast Cancer Metastasizes to the Dura: A Case Report and Critical Analysis of Diagnostic Approaches

Ankri Majda*, Yassine Zerhari, Fatima Zohra Benbrahim, Hatim Essaber, Asaad El Bakkari, Hounayda Jerguigue, Youssef Omor and Rachida Latib

Department of Radiology, Univesite Mohamed V Rabat, Morocco

***Corresponding Author:** Ankri Majda, Department of Radiology, Univesite Mohamed V Rabat, Morocco.

Received: January 08, 2025; **Published:** February 13, 2025

Abstract

Breast cancer is the most common malignancy affecting women worldwide. Dural metastasis of breast cancer is a rare manifestation that can present with a variety of neurological symptoms. In this article, we present a case of dural metastasis of breast cancer and provide a comprehensive review of the literature on this topic.

Keywords: *Dural Metastasis; Differential Diagnosis; MRI; Breast Cancer*

Case Presentation

Our patient is a 57-year-old woman with a history of breast cancer who presented with a one-month history of headache, nausea, and vomiting. A CT scan of the brain was performed, which revealed multiple dural-based soft tissue masses with peripheral edema. These masses were supra and infra tentorial and showed significant enhancement with intravenous contrast administration (Figure 1).

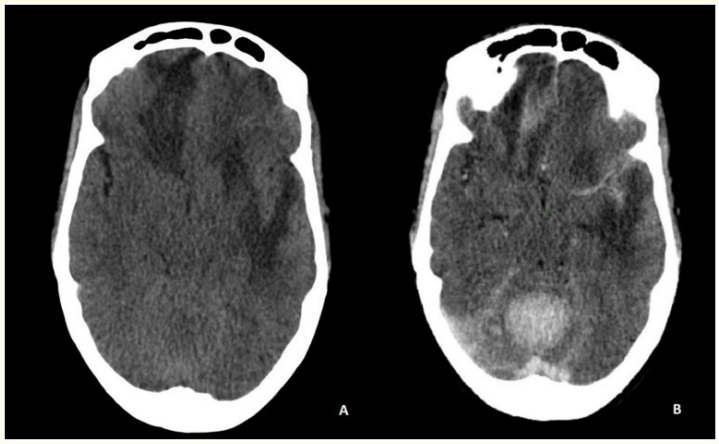

Figure 1: *A: CT in axial section before injection of PDC showed the edema, B: After injection of PDC, showed significant enhancement of the dural-based lesions (supra and infra tentorial).*

Subsequently, an MRI of the brain was performed, which confirmed the presence of a dural-based masses. They were hyperintense on T2-weighted images and FLAIR (Figure 2) and showed intense and homogeneous enhancement with gadolinium contrast administration (Figure 3). Finally, on spectroscopic imaging (MRS), they showed elevated choline and decreased N-acetylaspartate (NAA) levels, and elevated lipid-lactate peaks, which is indicative of necrosis (Figure 4). Taking into consideration the clinical context and based on MRI features, the diagnosis of dural metastasis was retained.

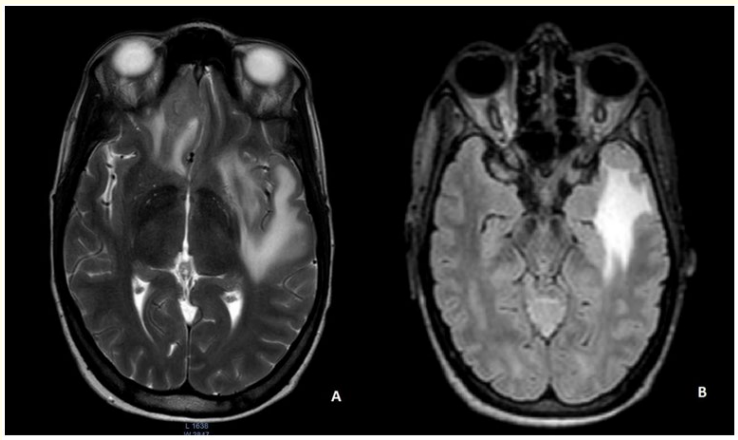

Figure 2: *A: MRI in axial section T2WI, B: FLAIR, showed the lesion of the left sylvian valley in high signal intensity T2 and Flair surrounded by a perilesional edema.*

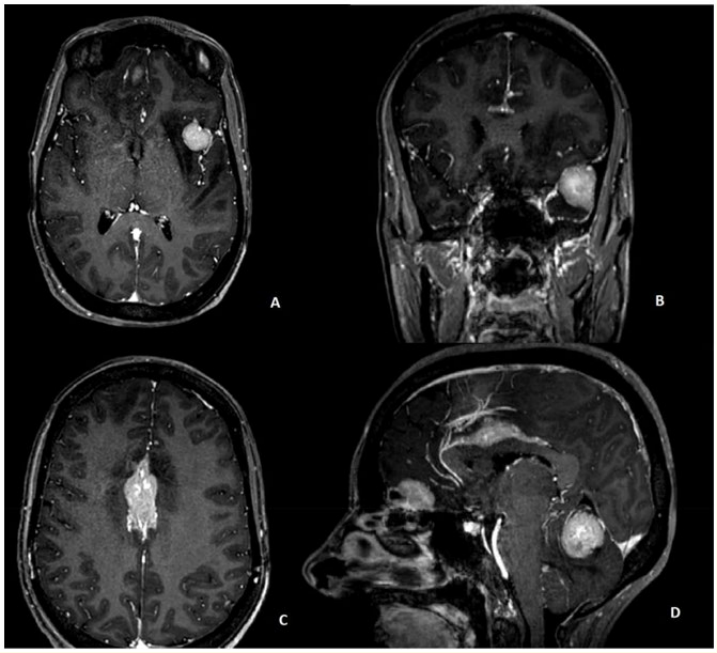

Figure 3: *(A, C): MRI in axial section after injection of gadolinium, B: coronal section, D sagittal section: showed the dural-based lesions with intense and homogenous enhancement.*

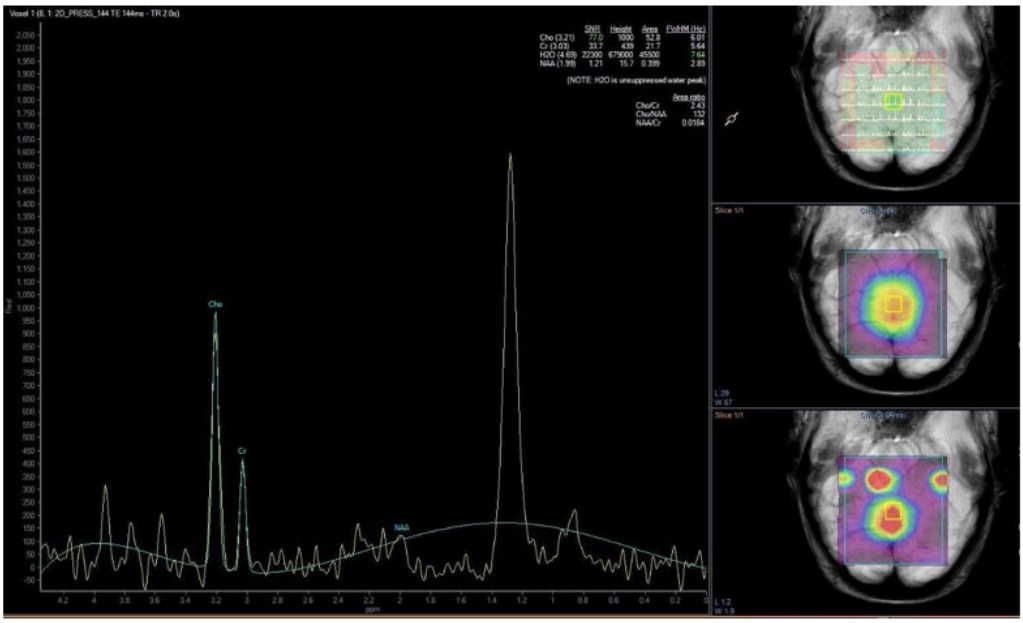

Figure 4: *MRS imaging, showed elevated choline levels and decreased N-acetylaspartate levels, and elevated lipid-lactate peaks.*

The patient started a whole-brain radiation therapy in addition to the systemic chemotherapy, with partial improvement of her symptoms.

Literature Review and Discussion

Dural metastasis of breast cancer is a rare occurrence, accounting for less than 1% of all brain metastases [1]. It typically presents with non-specific symptoms such as headache, nausea, and vomiting, and can be easily misdiagnosed as other neurological conditions [2]. However, there are several MRI features and spectroscopic aspects that can help differentiating dural metastasis from its differential diagnoses. Treatment options include surgery, radiation therapy, and chemotherapy [3].

Dural metastasis typically appears hypointense on T1-weighted images, and hyperintense on T2W, and show intense and homogeneous enhancement. In some cases, dural metastasis can present as a thickening or enhancement of the dura mater adjacent to the tumor, which is called the "dural tail sign" [3]. On DWI, the signal is variable, it depends on cellularity and on the necrotic character of the lesions. Finally, MRS can reveal elevated levels of choline and decreased levels of NAA. The presence of lactate and lipids can also be seen in more aggressive tumors or in case of necrosis.

Variety of other neurological conditions can cause similar symptoms, such as:

- **Meningioma:** Meningioma, which are extra-axial tumors with broad dural attachment. On MRI, they are typically well-circumscribed, homogenous masses that are isointense to slightly hyperintense on T1-WI and T2-WI. They often show intense and homogeneous contrast enhancement. On MRS, meningiomas show elevated choline and myo-inositol levels and decreased NAA levels.

- **Glioblastoma:** Glioblastomas are the most common primary brain tumors in adults [4]. On MRI, they typically appear as ill-defined, heterogeneous masses that are hyperintense on T2WI and FLAIR images and enhance heterogeneously after gadolinium administration. On MRS, glioblastomas show elevated choline and myo-inositol levels and reduced levels of NAA and creatine.
- **Lymphomas:** Lymphomas can present as dural-based lesions with surrounding edema, with variable enhancement pattern [4]. In some cases, it can also cause leptomeningeal enhancement, which can mimic meningeal carcinomatosis. On MRS, lymphomas may show elevated levels of choline, lactate and alanine, which are indicative of anaerobic metabolism and tumor hypoxia.

Another differential diagnosis to consider is meningeal carcinomatosis. On MRI, it can appear as diffuse leptomeningeal enhancement, focal nodular enhancement, or thickening of the dura mater.

Overall, a careful analysis of MRI features, along with clinical history, can help distinguish dural metastasis from its differential diagnoses and ensure proper management and treatment of the patient. Treatment should be tailored to the individual patient, taking into account the extent and location of the metastasis, as well as the patient's overall clinical condition.

Conclusion

Dural metastasis of breast cancer is a rare manifestation that can present with non-specific neurological symptoms. Imaging studies are essential for diagnosis, and treatment should be individualized based on the patient's clinical characteristics.

Our case report and literature review provide valuable insights into this rare condition and highlight the need for careful analysis of MRI features to avoid confusion with other probable diagnosis.

Funding Information

No funding was given.

Conflict of Interest

We declare no conflict of interest.

Bibliography

1. Lee DS., *et al*. "Dural metastases of breast cancer: a retrospective analysis of 32 patients". *Breast Cancer Research and Treatment* 90.1 (2005): 53-57.
2. Lee JH., *et al*. "Dural metastasis from breast cancer: a single center experience". *Journal of Korean Neurosurgical Society* 56.1 (2014): 28-33.
3. Lu Y., *et al*. "Dural metastases in 14 patients with breast cancer: a series report and literature review". *World Neurosurgery* 123 (2019): e542-e548.
4. Amer MH., *et al*. "Malignant brain tumors in patients with breast cancer. A review of 45 cases". *Cancer* 57.10 (1986): 2101-2103.

Volume 8 Issue 3 March 2025
©All rights reserved by Ankri Majda., *et al.*