

## Isolated Clivus Metastasis as the First Presentation of Relapse Breast Cancer: A Case Report and Literature Review

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### Abstract

### Case Report

The clivus is situated at an anatomically critical location next to brainstem and the majority of the cranial nerves and involved in approximately 1% of intracranial tumors. Isolated metastase to clivus have been rarely reported in breast cancer. We report a case of 58-year-old women, who present a cranialnerve palsy as the first presentation of isolated clival metastasis in a treated patient of breast cancer. The etiology was obtained by brain CT, magnetic resonance imaging (MRI) which showed lesion in the clivus. The diagnosis of clival metastasis from breast cancer was confirmed by transsphenoidal biopsy. The patient received radiotherapy with corticotherapy with favorable evolution within 5 days.

**Keywords:** clivus metastasis, breast cancer, cranial nerve palsy, radiotherapy.

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## INTRODUCTION

The clivus is situated at an anatomically critical location next to brainstem and the majority of the cranial nerves [1] and involved in approximately 1% of intracranial tumors [2]. The differential diagnosis of a clival mass is relatively broad and includes metastatic lesions, chordoma, meningioma, lymphoma, pituitary adenoma, and nasopharyngeal carcinoma [3].

Although metastatic lesions of the clivus are extremely rare, prostate and thyroid carcinomas are the most frequent metastasis sites followed by hepatocellular, renal, gastric carcinomas, melanomas, lung cancer, and liposarcomas [4]. Abducens nerve palsy (VI nerve) is uncommon sign in patients with clival metastasis [2]. However, metastasis of the clivus is very rare in patients with breast cancer [5-7].

Because of its close situation to the clivus and the cavernous sinuses, a metastatic lesion to the clivus can be cause unilateral or bilateral abducens nerve palsy [2]. Here, we present a case of cranial nerve palsy as the first presentation of isolated clival metastasis in a treated patient of breast cancer and a brief review of the literature.

## A CASE REPORT

A 58-year-old Moroccan woman was diagnosed with right locally advanced breast cancer in 2015. The biopsy of the lesion showed infiltrative ductal carcinoma Grade II. Estrogen and progesterone receptors were positive, and Her-2-neu was negative. Modified radical right mastectomy was done and the pathologic report showed an infiltrative ductal carcinoma, tumor size was 3 cm × 3.5 cm × 1.5 cm, Grade II of SBR, and 3 out of 18 axillary lymphatic nodes were found involved by the tumor. The tumor stage was pT2 N1 M0.

After surgery, she received six courses of adjuvant chemotherapy (3FEC 100 regimen followed by 3 docetaxel regimen) followed by radiotherapy to the chest wall, axilla, and supraclavicular nodes to total dose of 50 Gy in 25 fractions, 2 Gy/fraction. Along with radiotherapy, hormonal therapy with anastrozole (1 mg/day) was started. The patient had good locoregional and distant control for 5 years.

Two months before her admission to the Medical oncology department, she presented with facial asymmetry with exophthalmos (figure 1).

Ophthalmologist evaluation showed that her visual acuity was normal, slit lamp examination and fundus findings were in normal limits.

Hess screening confirmed the diagnosis of left rectus paresis. There were no associated comorbidities such as diabetes or hypertension. The brain CT scan showed a lytic lesion of tissue density located at the left side of clivus measuring 32,3 x 22,1 mm and highly suggestive of a metastasis (figure 2). However no compression over the pons was seen.

The brain Magnetic resonance imaging (MRI) showed an altered signal intensity of the left side of clivus. These findings confirmed the secondary nature of the tumor mass in the basal occiput, lateralized without any mass effect on the brain parenchyma, and the bone scan showed hyperfixation at this level. Positron emission tomography (PET) was performed to detect the possible origin of the lesion. The results did not found a relapse on either breast or elsewhere in the body. A biopsy was performed by neurosurgeon, and the histological study confirmed a metastasis of adenocarcinoma of mammary origin (figure 3).

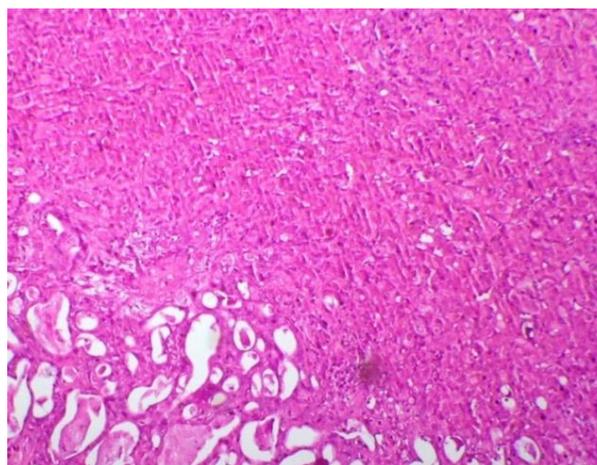
The patient was started on injectable methylprednisolone 120 mg twice daily with omeprazole 40 mg / day IV and radiation therapy was planned :30 Gy of whole brain radiotherapy was delivered in 10 fractions. The symptoms improved within 5 days.



**Fig-1: Patient had facial asymmetry showing his cranial nerve palsy**



**Fig-2: The brain CT scan showed a lytic lesion of tissue density located at the left side of clivus measuring 32,3 x 22,1 mm**



**Fig-3: Photomicrography showing metastatic adenocarcinoma from biopsy of clivus mass (HE, Gx100)**

## DISCUSSION

Tumors of the clivus are very rare, representing only 0.1-0.4% of all intracranial tumors, with chordomas and chondrosarcomas being the most frequent tumors of this region [4]. A small subset, only 57 cases reported in the literature, of metastatic clival lesions [8, 9].

About 70% of patients with advanced breast cancer have metastatic bone disease [10]. Typically, metastases spread to the bones and are usually multiple and involving more than one site: the spine, ribs, pelvis, upper arms and thighs [11]. Rarely, metastases can end up in the clivus region. The clivus is a rare site of isolated skeletal metastasis in breast cancer [12].

Patients with clival metastasis are often accompanied by multiple cranial nerve deficits [4, 13]. McDermott and coworkers [14] reported cranial nerve deficits suffered by 15 patients with metastatic prostate cancer. The presenting symptoms included facial numbness, tongue weakness, headache, ptosis, diplopia, proptosis, and unilateral blindness [14].

In the clivus, cranial nerve VI (CNVI) runs through Dorello's canal, and many patients with clival metastases present particularly neurologic signs with unilateral or bilateral CNVI palsy [8, 9, 13].

Reyes *et al.* reported abducens nerve palsy secondary to isolated brainstem metastasis from a breast cancer [5]. They reported a pontine mass lesion causing palsy of the sixth nerve. Hen and al. reported a metastatic mass in the facial colliculus of lower pons involving abducens nucleus resulting in gaze palsy [7].

Endoscopic endonasal approach for biopsy of lesions of the clivus carries a relatively low complication and mortality rate. In a total of 30 patients who underwent clival biopsies, there were no reports of meningitis, cerebrospinal fluid (CSF) leak, or encephalocele [15]. In addition, the advantages of endoscopic methods compared to conventional technics include more rapid recovery; reduce time of hospitalization and minimal postoperative distress. Importantly, it offers a tissue diagnosis that can guide the patient's adjuvant therapy [16].

Endoscopic transsphenoidal biopsy is essential in the cases of clival lesions to exclude another differential diagnosis [2].

Because clival metastasis spreads near to critical structures other than cranial nerves, including internal carotid arteries basilar artery, and brain stem, considerable morbidity and mortality burden is associated with the condition in the absence of early treatment [16].

The prognosis remains poor. The overall median survival of patients with clival metastases is about 2.5 years in Marchese study [17], and the average survival of patients with cranial nerve palsy involvement is only 5 months [17].

Despite successful local therapy in isolated clival metastasis (surgery or radiotherapy), about 80% will die of metastatic cancer within 5 years [18].

In a recent retrospective study [9], we collected 11 women with breast cancer metastasized at the clivus between 2000 and 2020 (20 years). Neurologic symptoms reported in patients with breast cancer were headache (46% of cases), and blurry vision or chin numbness (20% of cases). The study showed symptomatic improvement of cranial neuropathies after

radiation therapy. Furthermore, long term side effects, such as radiation necrosis, were not experienced by the patients [9].

Our case presented with facial asymmetry with exophthalmos as the sign of the sixth nerve palsy involvement and this presentation is very rare even in cases with skull base metastases from breast cancer. Radiotherapy is an effective palliative treatment for breast cancer patients with bone metastases including clivus. Our patient tolerated the radiotherapy well and there was a favorable response within 5 days of started radiotherapy and corticotherapy with improvement of neurologic symptoms.

## CONCLUSION

Breast cancer may disseminate to other tissues even in the absence of evidence for a local relapse. The sixth nerve palsy could be the revealing mode of clivus metastasis in breast cancer patients. Cranial nerve examination is needed for early diagnosis of clival metastasis because survival and quality of life were improved.

## Conflicts of interest

All authors declare NO conflicts of interest.

## REFERENCES

- Atik, A. F., Akpınar, T. S., & Seker, A. (2016). Rapid Effect of Gamma Knife Radiosurgery on Clivus Metastasis: A Case Report. *Indian Journal of Neurosurgery*, 5(01), 025-027.
- Kapoor, A., Beniwal, V., Beniwal, S., Mathur, H., & Kumar, H. S. (2015). Isolated clival metastasis as the cause of abducens nerve palsy in a patient of breast carcinoma: a rare case report. *Indian journal of ophthalmology*, 63(4), 354.
- Kimura, F., Kim, K. S., Friedman, H., Russell, E. J., & Breit, R. (1990). MR imaging of the normal and abnormal clivus. *AJR. American journal of roentgenology*, 155(6), 1285-1291.
- Pallini, R., Sabatino, G., Doglietto, F., Lauretti, L., Fernandez, E., & Maira, G. (2009). Clivus metastases: report of seven patients and literature review. *Acta neurochirurgica*, 151(4), 291-296.
- Amouzgar, H. F., Sardari, M., & Vakilha, M. (2005). An unusual metastatic breast cancer presentation; Report of a case.
- Reyes, K. B., Lee, H. Y., Ng, I., & Goh, K. Y. (2011). Abducens (sixth) nerve palsy presenting as a rare case of isolated brainstem metastasis from a primary breast carcinoma. *Singapore Med J*, 52(11), e220-e222.
- Han, S. B., Kim, J. H., & Hwang, J. M. (2010). Presumed metastasis of breast cancer to the abducens nucleus presenting as gaze palsy. *Korean Journal of Ophthalmology*, 24(3), 186-188.
- Dekker, S. E., Wasman, J., Yoo, K. K., Alonso, F., Tarr, R. W., Bambakidis, N. C., & Rodriguez, K. (2017). Clival metastasis of a duodenal

- adenocarcinoma: a case report and literature review. *World neurosurgery*, 100, 62-68.
9. Sturgis, R., Mack, A., Kim, S., Maier, J., & Heath, E. I. (2021). Symptom Outcomes of Cancer Patients With Clival Metastases Treated With Radiotherapy: A Study of 44 Patients. *Anticancer Research*, 41(10), 5001-5006.
  10. Buijs, J. T., & van der Pluijm, G. (2009). Osteotropic cancers: from primary tumor to bone. *Cancer letters*, 273(2), 177-193.
  11. Fisher, B., Kent, C., Osboprne, R., Margolise, G. (1997). Neoplasms of the breast. *Cancer Medicine*. 4th ed. Philadelphia, USA: Lippincott Williams and Wilkins, 2366-8.
  12. Brown, H.K., Healey, J.H. (2001). Metastatic cancer to bone. *Principles and Practice of Oncology*. 6th ed. Philadelphia, USA: Lippincott Williams and Wilkins ; 2713-27.
  13. Lodhia, V., & Puspanathan, T. (2017). Insidious enemy: downside to prolonged survival in prostate cancer. *Case Reports*, 2017, bcr-2017.
  14. McDermott, R. S., Anderson, P. R., Greenberg, R. E., Milestone, B. N., & Hudes, G. R. (2004). Cranial nerve deficits in patients with metastatic prostate carcinoma: clinical features and treatment outcomes. *Cancer*, 101(7), 1639-1643.
  15. Vellutini, E. D. A. S., Balsalobre, L., Hermann, D. R., & Stamm, A. C. (2014). The endoscopic endonasal approach for extradural and intradural clivus lesions. *World neurosurgery*, 82(6), S106-S115.
  16. Cathel, A., Khan, Y. R., Blais, D., Mahato, B., & Mahato, D. (2019). Metastatic disease to clivus: biopsy or not?. *Cureus*, 11(9).
  17. Marchese-Ragona, R., Maria Ferraro, S., Marioni, G., Staffieri, C., Manara, R., Restivo, D. A., & Staffieri, A. (2008). Abducent nerve paralysis: first clinical sign of clivus metastasis from tonsillar carcinoma. *Acta oto-laryngologica*, 128(6), 713-716.
  18. Joensuu, H. (2002). Treatment of locally advanced and metastatic breast cancer. *Oxford textbook of oncology*, 2, 1763-1786.