IMJ
Official Journal of the Irish Medical Organisation

Ir Med J; February 2025; Vol 118; No. 2; P24
February 20th, 2025

Clival metastasis presenting with oculomotor nerve palsy in a patient with a prior history of breast cancer

E. Visser[1], K. Elmusharaf[1], A. Ryan[2], M. O'Connor[3].

1. University Hospital Waterford, Waterford Regional Hospital, Dunmore Rd., Co. Waterford, Ireland.
2. Department of Radiology, University Hospital Waterford, Waterford Regional Hospital, Dunmore Rd., Co. Waterford, Ireland.
3. Department of Oncology, University Hospital Waterford, Waterford Regional Hospital, Dunmore Rd., Co. Waterford, Ireland.

Abstract

Presentation
A 77-year-old female patient presented with a short history of left sided ptosis, temporal headache, retro-orbital pain and diplopia having had a history of Stage IIA ($T_{1mf}N_1$) right breast cancer two years previously.

Diagnosis
CT-brain imaging documented an enhancing clival lesion and no other sites of disease. Histopathology via endoscopic transsphenoidal craniotomy debulking confirmed metastatic breast cancer.

Treatment
Transsphenoidal craniotomy debulking resulted in symptomatic relief and resolved the ptosis and diplopia. She received stereotactic radiosurgery (SRS). She was commenced on bisphosphonate and systemic chemotherapy.

Discussion
Clival metastases have been reported in association with a myriad of cancers; however, there are limited cases of solitary clival metastasis in the literature, none of which have presented with an oculomotor nerve palsy.

IMJ
Official Journal of the Irish Medical Organisation

Ir Med J; February 2025; Vol 118; No. 2; P24
February 20th, 2025

Introduction

Clival metastases represent approximately 0.02% of intracranial tumours[1]. They have been reported amongst various cancers including prostate, lung, hepatocellular, melanoma, and renal cell carcinoma[1-3]. They are exceptionally rare in breast cancer[2,4,5]. There are limited cases of patients with breast cancer presenting with a solitary clival metastasis, none of which in the current literature (Pubmed and EMBASE) have presented with an oculomotor nerve palsy. The close anatomic relationship between the clivus and the cavernous sinus contributes to clinical palsies; most commonly of the abducens or hypoglossal nerves[1-6]. This report highlights the unusual case of a solitary clival metastasis, presenting as an oculomotor nerve palsy; treated radically with neurosurgery and adjuvant concomitant chemoradiotherapy.

Case Report

A 77 year-old-female patient was diagnosed with Stage IIA ($T_{1mf}N_1$) right breast cancer in December 2021. She underwent a right sided mastectomy and sentinel node biopsy, followed by right axillary clearance; the immunohistochemistry was Luminal B, ER weakly positive, PR- and HER2- stains. She received adjuvant chemotherapy (CMF – cyclophosphamide, methotrexate, and fluorouracil) and radiotherapy of 40.05Gy in 15 fractions to the right chest wall, right undissected axilla and right supraclavicular fossa. She was commenced on anastrozole and was on surveillance.

In July 2023, she presented to the emergency department reporting a five-day history of left sided ptosis, temporal headache, retro-orbital pain and diplopia. A CT-brain demonstrated an enhancing lytic bone lesion centred at the left superior portion of the clivus, suspicious for osseous metastasis. Subsequent restaging CT-TAP with contrast demonstrated no concerning lesions within the thorax, abdomen or pelvis. An MRI head further characterised the clival lesion as being a 3.0 x 2.5 x 2.5cm expansile soft tissue mass with destruction of the sella turcica, the posterior aspect of the left sphenoid sinus, and displacement and encasement of the internal carotid artery (ICA). There was no other signal abnormality or concerning enhancement within the brain parenchyma detected.

IMJ
Official Journal of the Irish Medical Organisation

Ir Med J; February 2025; Vol 118; No. 2; P24
February 20th, 2025

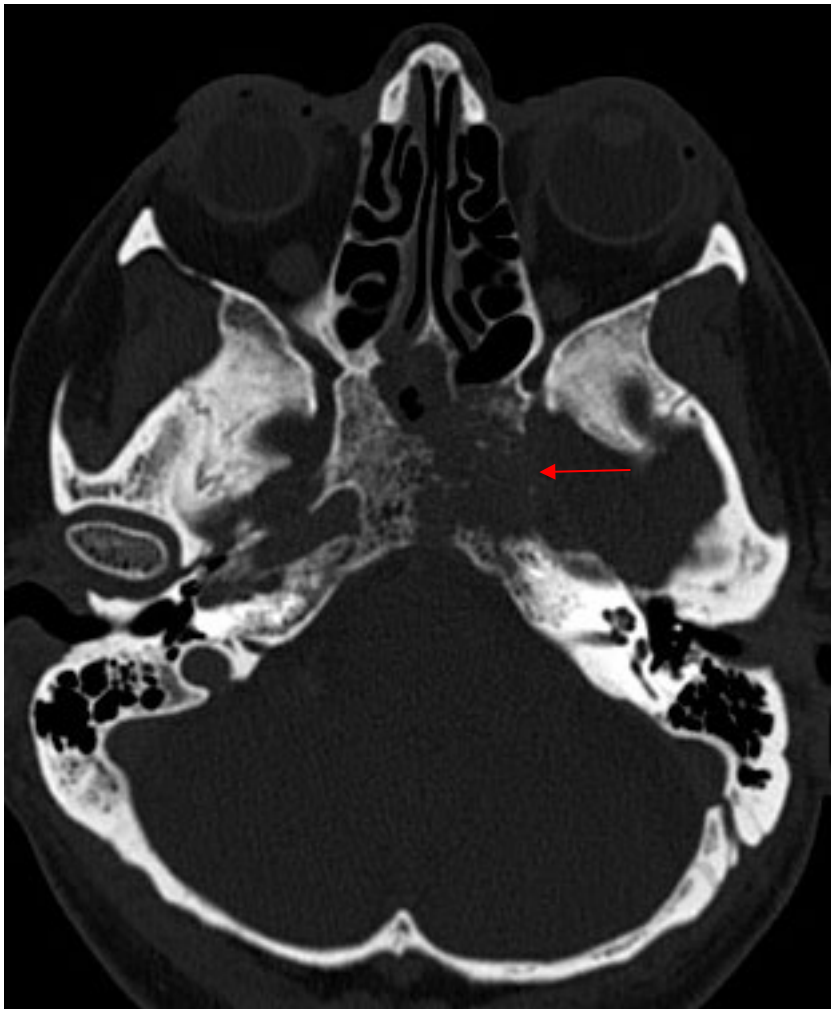

Figure 1a: Transaxial CT image showing extensive clival destruction.

Following discussion with neurosurgery, she was referred for trans-sphenoidal craniotomy debulking where 85% of the tumour was removed. The microscopic features were in keeping with a metastasis from breast cancer with one change from the prior immunohistochemistry in that ER, PR and HER2 were now all negative. She experienced good symptomatic relief of her ptosis and diplopia postoperatively. Examination of ocular movements and the facial nerve were normal. No sensory abnormalities were detected.

Postoperative MRI brain demonstrated residual enhancing and diffusion restricted tissue in the cavernous sinus, extending towards the left pterygopalatine fossa and encasing the lacerum, cavernous and clinoid ICA, measuring approximately 20 x 6.0mm in axial dimensions.

In the following weeks, the patient underwent fractional SRS (25Gy in 5 fractions) and was commenced on systemic chemotherapy (CAELYX).

IMJ
Official Journal of the Irish Medical Organisation

Ir Med J; February 2025; Vol 118; No. 2; P24
February 20th, 2025

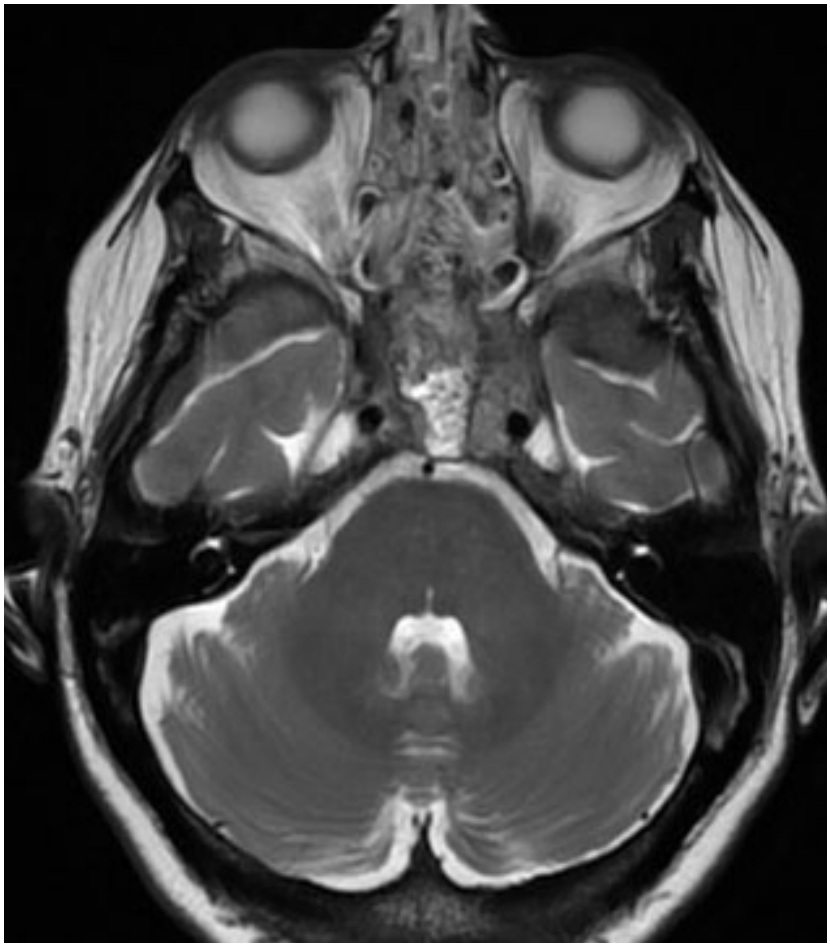

Figure 2: Transaxial T2 weighted MRI showing the high signal central defect in the central and posterior aspect of the tumour.

Discussion

In recent years, there have been marked improvements in breast cancer survival though approximately 25% of patients with early breast cancer will relapse. When metastases occur, they tend to be multifocal and commonly involve highly vascularised sites[1] such as the liver, lungs, bones or brain. Oligometastatic disease i.e. metastatic breast cancer with limited tumour burden is well described[7]. In the case of multisite and oligometastatic disease, it is important to clarify the pathology to ensure best outcomes with both local and or systemic therapies, given the significant improvements which have also been made in the therapy for metastatic disease.

Systematic review of PubMed and EMBASE delivered a limited number of cases of patients with breast cancer presenting with a solitary clival metastasis. Previous cases described clinical palsies of the abducens, vestibulocochlear, hypoglossal nerves[1-8]. Our case is unique

as we describe the first solitary clival metastasis presenting as an oculomotor nerve palsy in a patient with a history of multifocal breast cancer.

Declarations of Conflicts of Interest:
None declared.

Corresponding author:
Erin Visser,
University Hospital Waterford,
Waterford Regional Hospital,
Dunmore Rd.,
Co. Waterford,
Ireland.
E-Mail: visser967@gmail.com

References:

1. Jozsa F, Das JM. Metastatic Lesions of the Clivus: A Systematic Review. World Neurosurgery. 2022 Feb;158:190–204.
2. Sardari FAMVM. An unusual metastatic breast cancer presentation Report of a case . Iranian Journal of Radiation Research. 2005 Jun;3(1).
3. Pallini R, Sabatino G, Doglietto F, Lauretti L, Fernandez E, Maira G. Clivus metastases: Report of seven patients and literature review. Acta Neurochirurgica. 2009 Mar 4;151(4):291–6.
4. Kapoor A, Beniwal V, Beniwal S, Mathur H, Kumar H. Isolated clival metastasis as the cause of abducens nerve palsy in a patient of breast carcinoma: A rare case report. Indian Journal of Ophthalmology. 2015;63(4):354.
5. Han SB, Kim JH, Hwang JM. Presumed Metastasis of Breast Cancer to the Abducens Nucleus Presenting as Gaze Palsy. Korean Journal of Ophthalmology. 2010;24(3):186.
6. Khoo SG, Ullah I, Wallis F, Fenton JE. Isolated hypoglossal nerve palsy: a harbinger of malignancy. The Journal of Laryngology & Otology. 2007 Feb 13;121(8):803–5.
7. Miglietta F, Visani L, Marini S, Griguolo G, Vernaci GM, Bottosso M, et al. Oligometastatic breast cancer: Dissecting the clinical and biological uniqueness of this emerging entity. Can we pursue curability? Cancer Treatment Reviews. 2022 Nov;110:102462.
8. Tsunoda A, Tanaka Y, Sato T, Kirimura S, Kitamura K. Vertigo by Breast Cancer Metastasis 33 Years after Treatment. Internal Medicine. 2016;55(3):311–3.