CASE REPORT

Unusual Cause of Horner Syndrome 13 Years After In Situ Ductal Carcinoma

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ABSTRACT

Horner syndrome can be caused by a wide range of pathologies along the sympathetic nerve chain, from the hypothalamus to the orbit. Imaging workup of Horner syndrome is necessary given the potential for deadly lesions, especially in a patient with a previous cancer history. The authors report a case of a woman who presented with a preganglionic Horner syndrome secondary to vertebral metastasis from previously diagnosed breast cancer that involved the neural foramina at T1 and T2.

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Case report

A 68-year-old woman was referred for evaluation of possible Horner syndrome. She complained of the sudden painless onset of right upper eyelid ptosis for 1 month. Past medical history was significant for ductal carcinoma in situ (DCIS) of the left breast, which was treated with left mastectomy and chemotherapy over 10 years prior. Review of systems was positive for vague thoracic back pain of 3 months' duration. She denied any visual symptoms.

On examination, best-corrected visual acuity was 20/20 bilaterally with normal colour vision. She had right upper eyelid ptosis with pseudoeophthalmos. The right pupil was smaller than the left by 1.5 mm in room light. Dilation lag was present on the right. Apraclonidine 0.5% administration to both eyes resulted in resolution of ptosis and reversal of anisocoria on the right. This result was consistent with Horner syndrome. The rest of the neuro-ophthalmic examination was unremarkable.

Initial magnetic resonance imaging (MRI) of brain and brainstem was unremarkable. Chest x-ray was also read as normal.

The patient subsequently underwent MRI of cervical and thoracic spine. There was evidence of neoplastic infiltration of the vertebrae from

T1 through T6 levels. The infiltration completely filled the right-sided neural foramina starting at T1–T2 through T3–T4 levels, with slight infiltration of the paraspinal soft tissues (Figures 1 and 2).

Subsequently, the patient underwent a positron emission tomography (PET) scan for further assessment of the remainder axial and appendicular skeleton. PET scan showed hypermetabolic adenopathy within the chest and widespread hypermetabolic lesions throughout the spine, most prominently involving the upper thoracic vertebrae, the sacrum, both iliac bones, humeri, and femurs. The patient then underwent needle biopsy of the right iliac bone lesion. The pathology was consistent with metastatic ductal adenocarcinoma.

Discussion

This case illustrates an unusual cause of second-order Horner syndrome. The second-order or preganglionic neurons originate in the ciliospinal centre of the spinal cord between C8 and T2.^{1,2} The second-order neurons exit the ventral root of the spinal cord at the level of T1, arch over the apex of the lung, and ultimately synapse with the postganglionic neurons in the superior cervical

Figure 1. Unenhanced sagittal T1-weighted image demonstrating abnormal T1 hypointensity of the T1 and T2 vertebrae, in keeping with neoplastic bone marrow replacement. There is neoplastic infiltration of the right neural foramina at C7–T1 and T1–T2 levels (arrows). Normal appearing neural foramen at C6–C7 level (arrowhead).

ganglion. We propose our patient's Horner syndrome was secondary to metastatic involvement of the neural foramina noted above (Figures 1, 2A, B), since there was no MRI or PET scan evidence of other lesions to explain it.

Typically, second-order Horner syndrome is caused by tumours in the chest or neck, or surgery or other invasive procedures performed on the

chest or neck.³ Horner syndrome from metastatic disease of the spine is exceedingly rare, but has been reported in the instance of primary lung cancer causing C8–T1 radiculopathy.⁴ Horner syndrome due to primary osseous lesions and nerve tumours of the spine also have been reported.^{5–7} There have been two other cases of Horner syndrome secondary to metastatic breast cancer. Kovacic et al. reported a case of Horner syndrome from pleural metastatic breast cancer causing Pancoast-like syndrome without lung involvement.⁸ Vitale et al. reported a case of Horner syndrome due to left lateral cervical and supraclavicular lymph nodal mass involving the cervical sympathetic chain secondary to metastatic breast cancer.⁹ There has been one reported case of metastatic testicular seminoma that spread to the superior thoracic vertebrae causing Horner syndrome.¹⁰

Our patient presented with Horner syndrome due to metastatic recurrence of previously resected DCIS breast cancer over 10 years ago. This case demonstrates the necessity of a comprehensive imaging evaluation of Horner syndrome in a patient with a past history of cancer. Although surgical trauma was the most common cause of Horner syndrome in one retrospective cohort study,¹ our case illustrates that vertebral metastasis could cause compression of the postganglionic fibres of the second-order neurons, resulting in Horner syndrome. As ophthalmologists, timely patient referral for comprehensive imaging is essential in life-threatening lesions such as this patient.

Figure 2. Fat-saturated, enhanced axial T1-weighted image at (A) C7–T1 and (B) T1–T2 disc levels. There is neoplastic infiltration filling the right neural foramen and involving the right paraspinal soft tissues (arrows) in the expected region of (A) the stellate ganglion and (B) the ciliospinal spinal centre. Compare with normal-appearing nerve root in the left neural foramen (arrowhead) with surrounding enhancing venous plexus.

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Declaration of interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

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