



Case Report

Spinal metastasis of breast cancer presenting after 25 years: An extremely rare presentation

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Abstract

Breast cancer is the most frequently diagnosed cancer in females of the developed world and is gradually becoming the leading cause in the developing world as well. The innate biology of breast cancer is marked by varied presentations, characteristics, response, recurrence and metastatic phenomenon.

Even an early stage breast cancer has the potential to recur and/or metastasize after extremely long duration and this possibility should be borne in the clinician's mind.

Keywords:

Breast cancer, Delayed metastases, Radiotherapy.

Introduction

Regular follow-up duration for patients with breast cancer (BC) is 6–10 years. Metastases discovered 10 or more years after the initial diagnosis of BC are defined as late metastases and present as a rare event.⁽¹⁾ Metastasis to the spine is a common manifestation of BC leading to considerable reduction in the patient's quality of life. Physicians must consider the different treatments available to decrease pain, reduce tumor burden, and ensure spinal stability in order to prevent neurologic compromises.⁽²⁾ Published data on incidence rates of bone metastases (BM) and skeletal related events (SRE) after primary diagnosis of BC and subsequent bone metastasis are few. A Canadian study has postulated the pattern of metastatic disease in 180 patients with triple-negative BC compared with other subgroups of BC patients (N = 1,428) and estimated the risk of developing BM within 10 years after diagnosis as 7%–9% for all subgroups.⁽³⁾

Case presentation

A female in her sixth decade, with a positive family history of cancer was diagnosed as a case of invasive ductal carcinoma and ductal carcinoma in situ of the right breast in 1986. She was treated with Modified Patey's Mastectomy and, as the nodal status was

negative, did not receive any adjuvant radiotherapy (RT), chemotherapy or hormonal therapy and remained controlled loco-regionally. In mid-2013, she complained of persistent pain in the upper back that radiated to the flanks and around the chest. A Magnetic Resonance (MR) scan of the dorso-lumbar spine showed abnormal marrow signal involving T4 to T7 vertebral bodies with extension to the pedicles and post spinous processes. She was subjected to an ultrasound guided thoracic spine biopsy that revealed invasive carcinoma with Indian file growth pattern. Her estrogen and progesterone receptor status was positive while Her 2 neu receptor status was negative. She presented to us for evaluation of the feasibility of RT to the metastatic foci seen in the upper thoracic spine to relieve pain and minimize the possibility of local cord compression to improve her quality of life (QOL).

At presentation, she was in a fair general condition with no pallor, icterus, cyanosis, clubbing or any palpable peripheral lymphadenopathy. The right chest wall showed evidence of a mastectomy with healed

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scar but no palpable nodules underneath. The left breast was normal with no palpable intramammary nodule. Both axillae and supraclavicular fossae did not show any palpable nodes. Abdomen was soft with no palpable liver, spleen or any other mass. Spinal examination showed evidence of kyphoscoliosis with deep tenderness at the T6–T7 vertebral level and a small punctuate scar of a recent biopsy at T8 level. Neurological examination showed no sensorimotor or cranial nerve deficit.

Investigations

An MR Scan of the thoraco–lumbar spine showed scoliosis of the upper lumbar spine with concavity to the left with well aligned thoracic vertebrae. An abnormal marrows signal was seen involving T4 to T7 vertebral bodies with extension to the pedicles and post spinous processes especially at T3–T4 more on left side. There was no vertebral collapse seen and the spinal canal was well maintained at this level with no evidence of cord compression. The exiting left sided T4 and T5 nerve roots seemed

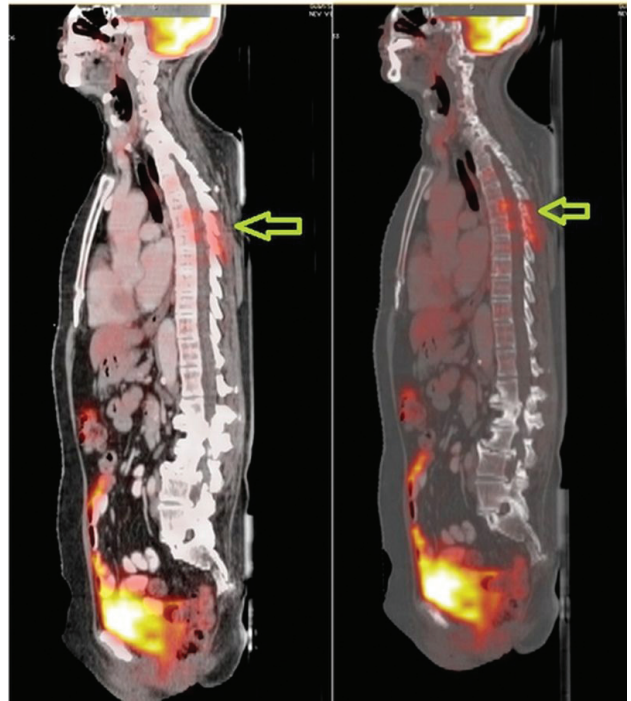


Figure 1: FDG avid lesions involving the bodies, pedicles, transverse processes and laminae of D–6 and D–7 vertebrae and body of D–3, D–5, D–8 vertebrae (yellow arrow)

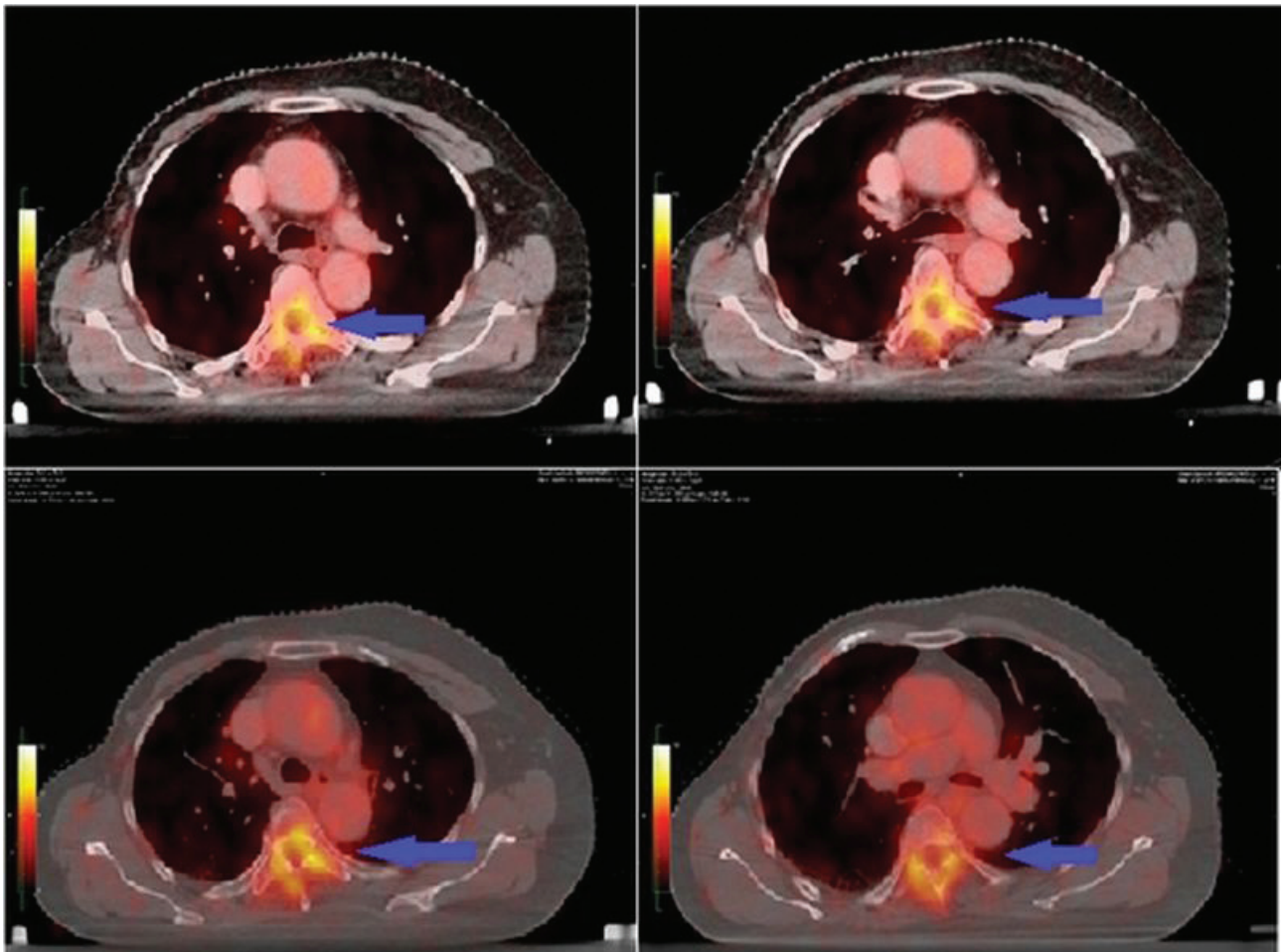


Figure 2: Intraspinal extradural extension in D–6 and D–7 vertebrae (blue arrow)

compromised within the neural foraminae with some extraosseous signal abnormality at level of the T3/T4 spinous processes. Rest of the spinal marrow signal was normal. There also was background multilevel disc degenerative disease at the mid to lower lumbar spine and cord signals were normal. Following this, she was subjected to a USG Guided Thoracic Spine biopsy that was reported as Invasive Carcinoma with Indian File growth pattern. ER; PR positive, e-cadherin positive and HER2 negative. Among Tumor Markers, CA19.9 (7.6), CA125 (5.5) and CEA (2.0) were normal while CA153 breast antigen was significantly raised at 122.9 (Normal = <35).

She was further subjected to a whole body Positron Emission Tomography (PET) Computerized Tomography (CT) scan to rule out any systemic metastases that revealed Fluoro Deoxy Glucose (FDG) avid (Standard Uptake Value max: 4.9) lytic lesions involving the bodies, pedicles, transverse processes and laminae of D-6 and D-7 vertebrae with intraspinal extradural extension, bodies of D-3, D-5 vertebrae, D-8, L-2 vertebrae, body of sacrum, left ala of sacrum and posterior pillar of right acetabulum. There was no evidence of FDG active disease elsewhere in the body. (Figures 1, 2)

Treatment

She was planned to receive palliative RT to the dose of 5000 cGy in 25 fractions covering D3 to D7 vertebrae with an aim to alleviate symptoms of neuralgic pain with relation to the dorsal vertebrae (Figure 3). She was also given steroid supplementation to ward off the possibility of radiation induced spinal cord oedema.

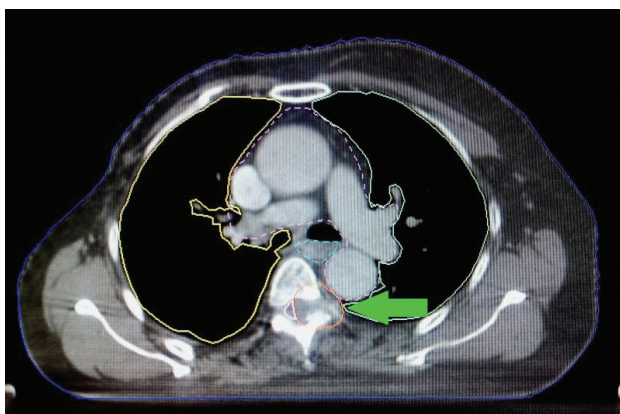


Figure 3: Radiation portal covering the tumor volume (Gross tumour volume depicted with green arrow).

Outcome and follow up

She tolerated the treatment well, reported good pain relief and was seen one month after the completion of her treatment when she had mild to moderate pain in the mid-back. The pain was not severe as previously and was resolving gradually. Her requirement for painkillers had reduced from 6 a day to an occasional tablet of paracetamol.

Discussion

Nearly all BC related deaths are caused by metastases rather than the primary tumor. ⁽⁴⁾ Different subtypes of BC show distinct metastasis behaviors in terms of the temporal kinetics and anatomic sites suggesting a dormant stage of metastasis progression wherein cancer cells either stay quiescent or proliferate very slowly. ⁽⁴⁾ The bone is the most common site of metastasis, with osseous metastases developing in 8% of all, and 69% of advanced BC patients. BM is predisposing to pathologic fractures, spinal cord compression, anemia, and hypercalcemia. BC has a particular affinity for the spine and one-third of these lesions become symptomatic causing pain, neurological deficits, disability and deterioration in QOL. BC metastases constitute the most common cause of symptomatic spine metastases. ⁽⁵⁾ Pain is the most common symptom and the presenting complaint in nearly 90% of patients with spinal metastases from BC. ⁽⁶⁾

Any patient with a known history of malignancy who presents with a new-onset back or neck pain should be promptly and thoroughly evaluated with a high suspicion for metastatic disease involving the spine. Common degenerative disorders less commonly affect the thoracic spine than the cervical or lumbar spine, hence pain in the thoracic spine warrants a high clinical suspicion for metastatic disease. ⁽⁷⁾ The available imaging modalities to evaluate for suspected BC metastatic to the spine include plain radiographs, skeletal scintigraphy, computed tomography (CT), MR imaging and PET-CT. These modalities carry varying sensitivities, degrees of information, and costs in evaluating for spinal metastases and each imaging technique may play a valuable role in the evaluation of the at-risk patient depending on the clinical situation. ⁽⁸⁾

RT is an effective treatment option in the treatment of spinal metastasis and can effectively control neurological pain symptoms. Prevention of skeletal events is one of the goals of palliative RT in patients with BM. Dose fractionation and the type of RT must be tailored to each patient individually keeping in mind the goals of treatment and started at the earliest.⁽⁶⁾

Conclusion

BC is a systemic rather than a local disease. About 20% to 40% of patients with BC eventually develop recurrences in distant organs, often not detected until years to decades after the primary tumor diagnosis. A thorough history and clinical examination aided with imaging and histopathology should be the diagnostic approach for metastatic BC. Radiotherapy is an effective tool in palliative treatment of spinal metastasis and is part of an interdisciplinary approach.

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