

CASE REPORT

Pathological Spinal Fracture Due to Metastasis of Mucinous Breast Carcinoma

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Summary

Spinal metastases represent a common event in oncological patient. Such tumour spread can reduce the life quality significantly due to pain, pathological fracture and spinal cord compression. Breast cancer is among the most common primary sources. However, certain histological types of breast cancer, including mucinous carcinoma, are known for less aggressive behaviour. Here we present a clinical case of 44-year-old female affected by mucinous carcinoma in left mammary gland, resulting in regional lymph node involvement and multiple remote metastases in left lung and Th7 vertebra. This case is notable as mucinous breast carcinoma rarely develops at such age and infrequently shows wide metastatic spread.

Key words: mucinous carcinoma, breast cancer, spinal metastasis, pulmonary metastasis, multiple metastases

AIM OF THE DEMONSTRATION

The aim of the demonstration is to present a rare clinical case of mucinous breast carcinoma showing such unusual features as the occurrence in a young female and wide metastatic spread.

CASE REPORT

A 44-year-old female was admitted to the hospital because of lower paraparesis. The patient complained about increasing back pain in previous 2 weeks and progression of leg weakness within preceding 4 days. Four days before the present admission, she experienced acute thoracic back pain and approached the nearest hospital abroad. Physical examination, thoracic spine X-ray, abdominal and mammary gland ultrasonography (US) were performed. During physical examination, obvious left breast enlargement with ulcerations, skin oedema and multiple palpable masses were evident. The X-ray revealed Th7 vertebral metastases. Symptomatic therapy was provided.

At present, general condition was estimated as average. The Glasgow coma scale score was 15, arterial pressure – 220/146 mm Hg, heart rate – 90 beats per minute. Urinary retention was observed. Neurological examination revealed decreased muscle strength in both legs (left 3 – 4/5, right 2 – 3/5) and superficial sensory disturbance below Th5. Thoracic computed tomography (CT) showed pathological compression fracture of Th7 vertebra with spinal canal compression and impression in spinal cord 2/3rd deep (Fig. 1A). An emergency spinal Th7 decompression and laminectomy was performed in 60 minutes. Motor and sensory functions improved after surgery. The postoperative period was smooth.

After surgery, contrast-enhanced thoracic CT and native abdominal CT were performed. Chest CT showed large pathological mass in the left mammary gland (Fig. 1B). The mass reached 15 cm in diameter and was surrounded with multiple smaller nodules having average diameter 2.6 cm. Multiple pathological nodules were found in left axilla, measuring up to 3.2 cm in diameter.

Multiple nodules were also evident in mediastinum located paratracheally and below left hilum (largest 1.8 cm). Multiple metastases were detected in left lung measuring up to 0.3 cm. Abdominal CT showed no evidence of metastatic spread. Both histology of neurosurgical operation material and punch biopsy of left mammary gland yielded invasive mucinous carcinoma characterised by marked accumulation of mucus and low nuclear grade (Fig.2). The molecular type was luminal A (Fig.2). The local oncology council recommended symptomatic treatment only.

DISCUSSION

Spinal metastases are frequent in oncological patients. The spine is estimated to be the third most commonly affected site, following only lungs and liver. Almost 5 – 30% of patients affected by metastatic cancer have spinal metastasis. Higher rates, reaching even 30 – 70%, have been reported from autopsy studies. However, only 10% of these metastases are symptomatic. About 70% of symptomatic metastases are found in the thoracic vertebrae, mostly Th4 – 7. Breast cancer is among the most frequent (24%) primary sources (Tse, 2014).

Breast cancer is the most common malignant tumour in females worldwide. As shown in the World Health Organization Detailed Mortality Database (<http://data.euro.who.int/dmdb/>; accessed 16.11.2014.), the most recent age-standardized death rate estimates due to breast cancer in Europe range from 9.22 per 100 000 in Spain to 18.84 in Armenia reaching 13.80 in Latvia. In 2012, 15% of cancer-related deaths in Latvian females were caused by breast cancer. Breast cancer show high occurrence of bone metastases that has remained almost unchanged over long time reaching 73.1% in historical autopsy studies (Abrams *et al.*, 1950) and cumulative incidence 54.2% at 24 months by recent estimates (Oster *et al.*, 2013).

However, breast cancer is a highly heterogeneous disease. Mucinous carcinoma represents a rare histologic type comprising 0.7 – 6% of all breast cancers (Bae

et al., 2011; Sas-Korczynska *et al.*, 2014). In Western populations, it usually develops in elderly ladies. The median age is 67 – 71 years (Di Saverio *et al.*, 2008; Sas-Korczynska *et al.*, 2014). Mucinous breast carcinoma is known for relatively indolent course. Recent studies suggest that mucinous carcinoma is a separate molecular entity (Bae *et al.*, 2011). In a huge long-term follow-up of 11422 mucinous breast carcinoma patients, only 2% had distant metastases and 12% had lymph node metastases. Thus, the specific 10-year survival rate was 89%, 15-year: 85% and 20-year: 81% (Di Saverio *et al.*, 2008). During the treatment, 5.3% of patients developed distant metastases, including bone lesions in 1.1% of patients (Sas-Korczynska *et al.*, 2014). The most significant prognostic factors were nodal status, tumour size, age, nuclear grade and progesterone receptor status (Di Saverio *et al.*, 2008).

The treatment guidelines by European Society of Medical Oncology recommend emergency neurosurgical treatment in case of spinal cord compression. The applied neurosurgical approach was in accordance with these guidelines and lead to clinical improvement. Bone modifying agents such as bisphosphonates or denosumab are recommended along with systemic treatment (Cardoso *et al.*, 2014).

In conclusion, we present mucinous breast carcinoma in an unusually young patient. The case is characterised by wide metastatic spread despite the typical low nuclear grade retained in the metastases along with pure mucinous histology and luminal A molecular type. The case should alert attention to personalised approach for each patient as even tumours that are considered indolent occasionally show adverse clinical course.

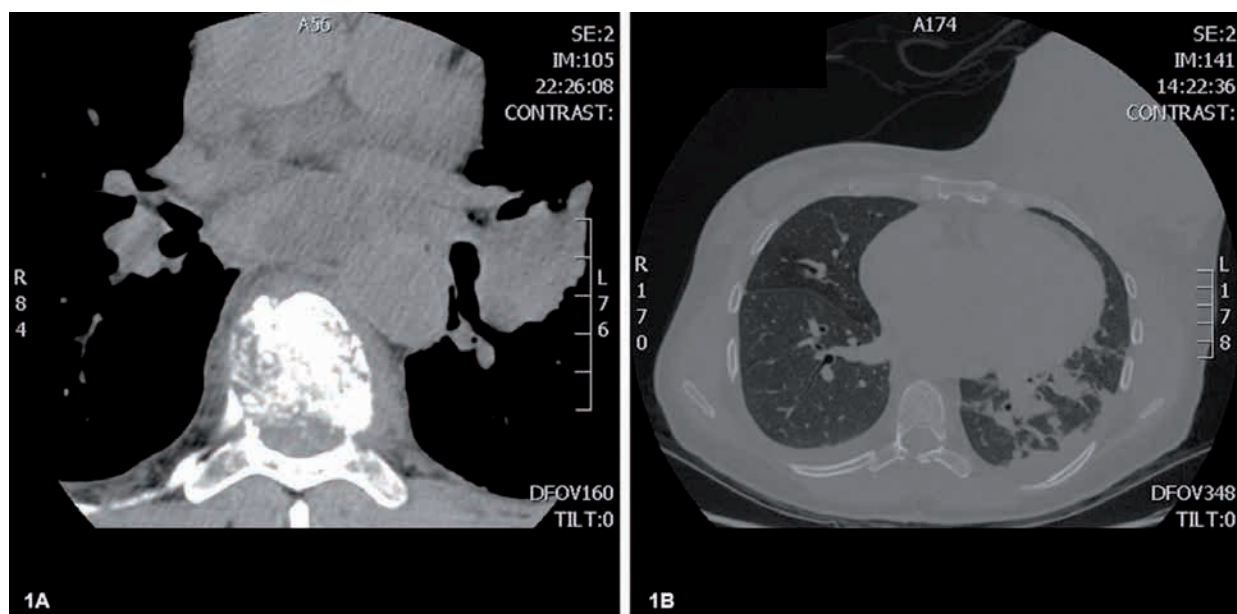


Fig. 1. The computed tomography findings of spine and chest. 1A, Destruction of the Th7 vertebra. Note the compression of the spinal cord. 1B, Large mass of the left breast and pathological changes in the left lung.

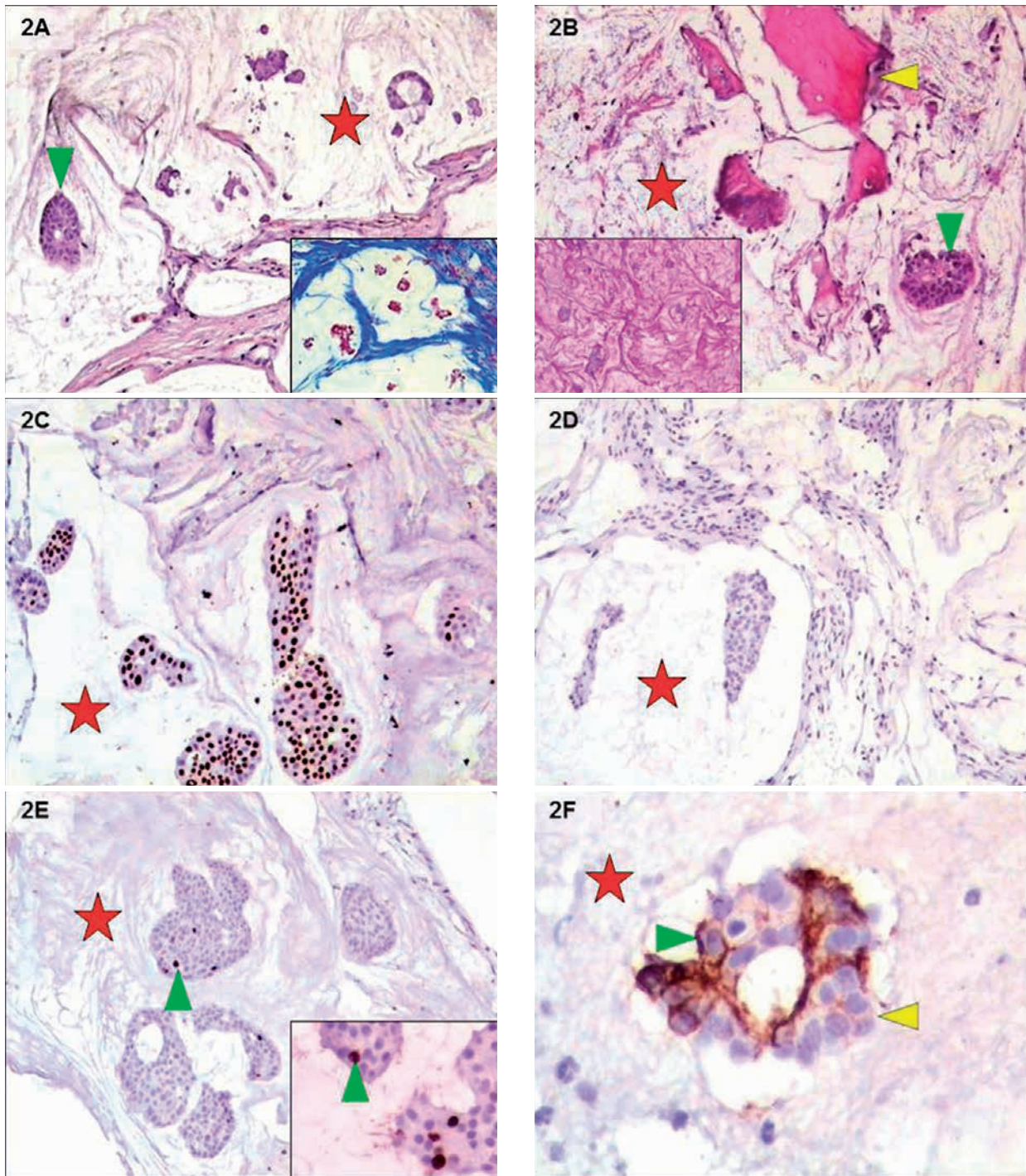


Fig. 2. Tissue structure of the breast tumour and spinal metastasis. 2A, Mucinous carcinoma of the breast. Note the tiny cluster of malignant cells (green arrowhead) and wide accumulations of mucus (red star). Haematoxylin-eosin (HE), original magnification (OM) 50x. Inset: Low amount of desmoplastic stroma. Masson's trichrome, OM 50x. 2B, Spinal metastasis of mucinous carcinoma. Note the fractured bone trabecula (yellow arrowhead), small cluster of malignant cells (green arrowhead) and mucus lakes (red star). HE, OM 50x. Inset: Mucus highlighted by PAS stain, 50x. 2C, Nuclear expression of oestrogen receptors. Immunoperoxidase (IP), OM 100x. 2D, Lack of HER2 protein. Hercep test, OM 50x. 2E, Low proliferation fraction (3.8%) by Ki-67. This parameter along with presence of oestrogen receptors and lack of HER2 overexpression defines the cancer as belonging to Luminal A molecular type. Representative proliferating, Ki-67-positive cells are shown with green arrows. IP, OM 50x. Inset: 400x. 2F, Focal loss (yellow arrowhead) of adhesion protein E-cadherin. The green arrowhead points towards a neoplastic cell with retained membranous reactivity. IP, OM 400x. 2A – 2F, The mucus lakes are highlighted by red stars.

Conflict of interest: None

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