CASE FOR DIAGNOSIS

A 53-year-old female with haemoptysis following breast cancer resection

R.S. Morehead*, W.J. Dale[#] and E.Y. Lee[†]

CASE REPORT

A 53-yr-old female presented with a 1-month history of cough productive of blood-flecked white sputum and right-sided chest pain. She had undergone a mastectomy 11 months previously for breast cancer. At surgery, the resection margins were free of tumour, lymph node sampling was negative, and no additional therapy was given. A chest radiograph at that time was normal. The patient's medical history was otherwise remarkable for a remote seizure disorder, migraine headaches, and a 15 pack-yr smoking history without known lung disease. There was no history of fever or chills, weight loss, dyspnoea, sinus complaints, voice change, renal disease, distant travel or other provocative exposures.

Examination disclosed a thin female in no distress. She was afebrile with a blood pressure of 130/70 mmHg, pulse of

104 beats·min⁻¹, and respirations of 20 breaths·min⁻¹. Apart from a left mastectomy scar, the examination was unremarkable with normal heart and lungs. There were no skin lesions, enlarged lymph nodes or abnormal neurological findings. Laboratory studies were remarkable for a leukocyte count of 10.2×10^9 cells·L⁻¹, and normal haematocrit, renal function and serum calcium. Antineutrophilic cytoplasmic antibody testing was negative. An abnormal chest radiograph was obtained (fig. 1).

The abnormal radiographic imaging prompted the present authors to perform bronchoscopy with transbronchial biopsy. There were no endobronchial abnormalities and the biopsy specimens were nondiagnostic. A transthoracic needle biopsy was performed (fig. 2), and subsequently, the original breast resection specimen was re-reviewed (fig. 3).

FIGURE 1. Chest radiograph showing a) posterior–anterior view and b) lateral view.

Depts of *Medicine, and [†]Pathology, University of Kentucky Medical Center, and [#]Veterans Affairs Medical Center, Lexington, KY, USA.

CORRESPONDENCE: R.S. Morehead, Division of Pulmonary and Critical Care Medicine, K-528 Kentucky Clinic, Lexington, KY 40536-0284, USA. Fax: 1 8592572418. E-mail: smore2@email.uky.edu

FIGURE 2. Fine-needle aspirate cytology (haematoxylin and eosin). Scale bar=50 μ m.

FIGURE 3. Original breast resection pathology. Scale bar=200 μ m.

BEFORE TURNING THE PAGE, INTERPRET THE CHEST RADIOGRAPHS, NEEDLE BIOPSY SPECIMEN AND ORIGINAL BREAST RESECTION SPECIMEN, AND SUGGEST A DIAGNOSIS.

INTERPRETATION

Chest radiography

Figure 1 reveals bilateral parenchymal masses with cavitation distributed throughout all lung fields. The heart and pleura appear normal, and there is no obvious lymphadenopathy. There is evidence of left mastectomy.

Needle biopsy specimen

Figure 2 shows poorly differentiated carcinomatous cells.

Original breast resection specimen

Figure 3 shows metaplastic carcinoma with a biphasic appearance. The arrows indicate overt carcinoma with chondrosarcoma-like matrix.

Diagnosis: Pulmonary metastases from metaplastic carcinoma of the breast.

CLINICAL COURSE

After review of the original breast resection, and in view of the negative lymph nodes and resection margins 11 months previously, a diagnosis of metaplastic carcinoma of the breast with metastasis was reached. The patient's clinical course rapidly worsened. Due to her rapidly declining performance, she was considered a poor candidate for chemotherapy and died <2 months later.

DISCUSSION

Metaplastic carcinoma of the breast, also referred to in the medical literature as spindle cell carcinoma, carcinosarcoma and carcinoma with sarcomatous differentiation, is a rare malignant neoplasm, accounting for <1% of all breast cancers [1]. The tumour contains elements of both epithelial and mesenchymal differentiation with a varied histological appearance. Patients with this tumour typically present with a breast mass, similar to usual breast cancer. As such, the diagnosis is usually made following primary breast resection where the characteristic pathological appearance is recognised. However, the diagnosis may be missed if the sarcomatous elements are not identified by thorough examination of the specimen, and pathologists without expertise in breast cancer may discount small metaplastic foci if perceived as an insignificant component of the tumour. Diagnosis by fine-needle biopsy is even more challenging as the foci of metaplastic differentiation may be missed, especially if proper immunostaining is not performed [2].

Distinguishing metaplastic breast carcinoma from usual epithelial breast cancer is important as there are important clinical differences in the natural history and management of this tumour. First, metaplastic breast carcinoma is a more aggressive malignancy with a poorer prognosis; the reported 5-yr survival rate is 43–49% [1, 3]. Secondly, the pattern of spread often resembles a sarcoma in its propensity for haematogenous spread to the lungs. In contrast to usual epithelial breast carcinoma, the likelihood of metastasis is not predicted by lymph node status at resection [4]. Finally, optimal therapy for this neoplasm is unclear due to its rarity and the consequent lack of well-performed therapeutic trials. Indeed, difficulty in predicting the tumour's behaviour is often an impediment to treatment, as it is unclear whether the presence of metaplastic elements demands that the tumour be treated aggressively despite what would be deemed a low surgical stage (*i.e.* negative resection margins and lymph node sampling). While

complete resection offers the best prospect for long-term survival [1, 5], available data suggest that combinations of surgery, radiotherapy and chemotherapy are superior to surgery alone in established metaplastic breast carcinoma, as was reported in a series of 50 patients seen at M.D. Anderson Cancer Center (Houston, TX, USA) [1].

The case presented in this report is notable for the unusual finding of multiple cavitory masses in the setting of resected breast cancer. The discovery of multiple cavitory lung masses should prompt diagnostic considerations, such as necrotising vasculitis, endemic fungal infection, septic embolisation, and necrotising sarcoid angiitis, in addition to metastatic disease. Cavitory lung metastases may occur in a number of tumours including lymphoma, squamous cell carcinoma of the head and neck, cervical carcinoma and sarcoma, but are rarely identified by chest radiography in usual epithelial breast carcinoma. However, with the more widespread use of computed tomography, cavitation of breast cancer metastases has become a recognised, if uncommon occurrence, often following chemotherapy [6, 7].

In the present patient, there was no evidence of systemic vasculitis or infection, and the patient's history of recent surgery with negative resection margins and lymph node survey made metastasis from epithelial breast cancer unlikely. Only after malignant cells were obtained by needle aspiration cytology was the original pathology report re-examined and the diagnosis of metastatic metaplastic breast carcinoma reached.

The rapid evolution of the lung masses, as presented in the present case, is quite characteristic of metaplastic breast carcinoma, and earlier recognition of the significance of the original breast resection pathology would have led to a more timely diagnosis. This neoplasm should be considered in the differential diagnosis of cavitory lung lesions, especially in patients with a history of breast cancer. In this context, reviewing original pathology may uncover unappreciated sarcomatous elements as it did in the present case. Early identification of metaplastic breast carcinoma is important as its identification has important implications for prognosis and treatment.

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