Diffuse unresolving pulmonary nodules in a patient with a history of cervical carcinoma

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DESCRIPTION

A 33-year-old woman with a history of cervical carcinoma status post total abdominal hysterectomy and bilateral salpingo-oophorectomy in 2006 presented to the emergency department with acute-onset, sharp, pleuritic chest pain associated with shortness of breath and fever up to 39.9°C. Physical examination revealed a patient in severe respiratory distress with a rate of 54 breaths/min, heart rate of 154 bpm and blood pressure of 104/64 mm Hg. She was intubated emergently and placed on mechanical ventilation. Chest auscultation revealed decreased breath sounds and crackles bilaterally. A CT of the chest with intravenous contrast revealed innumerable nodules throughout both lung fields with scattered central necrosis (figure 1A). A blood clot obstructing the inferior vena cava (IVC) was visualised incidentally, and percutaneous extraction was performed. The patient went into septic shock rapidly and empiric broad-spectrum antibiotics were initiated. Blood, sputum and clot cultures grew Gram positive cocci identified as methicillin-resistant *Staphylococcus aureus* (MRSA). The clinical picture coupled with the presence of diffuse pulmonary nodules was consistent with a diagnosis of septic pulmonary emboli (SPE) from MRSA seeding the IVC clot.

The patient had multiple complications from the severe inflammatory response over the ensuing month, including acute respiratory distress syndrome and acute kidney injury requiring renal replacement therapy. The acute period was also complicated by multiple pneumothoraces requiring chest tube placement. A repeat CT of the chest on day 30 failed to show significant improvement in size or quantity of pulmonary nodules despite 4 weeks of directed antibiotic therapy (figure 1B). The concern was that the patient may have had these nodules prior to this acute illness and that they may represent metastatic disease from her history of cervical carcinoma. The theory would have explained the IVC clot in a patient without known hypercoagulable disorders. To determine definitively the nature of these nodules, a transthoracic biopsy was undertaken, which showed alveolar lung parenchyma with abundant acute and chronic inflammation, and areas of consolidation and necrosis consistent with focal necrotising pneumonia. There was no evidence of malignancy.

An approach to the differential diagnosis of diffuse pulmonary nodules is described in figure 2. The present case had lesions of different sizes, some with central necrosis, involving the pleural surfaces, in a random distribution, which made malignancy and infection the only possible aetiologies.^{1 2} The feeding vessel sign, which consists of a

Figure 1 CT of the chest on day 1 depicting diffuse pulmonary nodules in a random distribution with a feeding vessel sign (arrow) (A). CT of the chest on day 30 showing persistence of nodules with interval development of pneumothoraces (B). CT of the chest on day 50 showing improvement in the size and quantity of nodular lesions with scattered cavitation (arrows) (C).

distinct vessel leading directly to a nodule, has been considered highly suggestive of septic pulmonary embolism. Cavitation within the nodule is another finding that reflects local necrosis and infarction,

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Figure 2 Chart depicting basic approach to the nodular pattern on chest imaging. SPE, septic pulmonary emboli; TB, tuberculosis.

and the development of pneumothoraces is a recognised complication associated with septic pulmonary emboli. All of which were seen in the patient.¹

Learning points

- ▶ The differential diagnosis of diffuse pulmonary nodules should always include malignancy, but the unresolving nature should not deter physicians from a diagnosis of septic pulmonary emboli (SPE) in the proper clinical setting as these lesions can take up to 8 weeks to show signs of resolution.
- ▶ A basic approach that involves determining the distribution of diffuse pulmonary nodules can help narrow down the differential diagnosis, as shown in the figure.
- ▶ Random distribution, involvement of the pleurae, central necrosis and/or cavitation within nodules, and the feeding vessel sign, are all findings consistent with SPE.

The unusual finding was the unresolving nature of these infectious nodules in a patient with a history of cancer. The radiographic evolution of SPE has not been well described in the literature, and there is an expectation that infection should resolve rapidly. Levent *et al*³ described a single case of SPE from septic arthritis in which nodular lesions showed marked improvement after 3 weeks of antibiotic therapy. The nodular lesions in the present case persisted up to 8 weeks until mild improvement was visualised (figure 1C).

Competing interests None.

Patient consent Obtained.

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