Cannonball shadow in the lungs and pulmonary embolism in a young man

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DESCRIPTION

A 20-year-old non-smoking man presented with a history of chest pain, cough, loss of weight and appetite for a 3-month duration. Prior to presentation, he was diagnosed at a local hospital as having pneumonia and was treated with oral and intravenous antibiotics. Since the patient's symptoms did not abate with treatment, he was referred to our centre for further management.

On physical examination, his vital signs were within normal limits. He was not in obvious distress. There was a hard right-sided testicular swelling. His left testis was normal in consistency. There was no evidence of a hydrocele. The rest of the systemic examination was unremarkable.

Laboratory findings

His blood counts and routine serum biochemistries were normal. His serum lactate dehydrogenase (LDH) was elevated at 3492 IU/L (normal up to 160 IU/L), β -human chorionic gonadotropin (β -HCG) was 89.29 mIU/mL (normal up to 5) and α -fetoprotein was 14 IU/mL (normal up to 5.5). Serum antineutrophilic antibodies were not detected. The Mantoux test and sputum smear and culture for *Mycobacterium tuberculosis* bacilli were negative. His chest X-ray revealed multiple nodular lesions of varying sizes without air bronchogram (figure 1). CT showed large nodular discrete lung masses, the largest in the right upper lobe measuring 7.5×5 cm (figure 2). Some masses showed heterogeneous enhancement with areas of necrosis. There were filling defects suggestive of thrombus in the right pulmonary artery and the right descending pulmonary artery (figure 3). The differential diagnoses considered were metastatic tumour, infections like tuberculosis,¹ multisystem disorders like Wegener's granulomatosis^{1 2} and rheumatoid nodules with pulmonary embolism, multiple large, well-defined cannonballs (primarily with choriocarcinoma and seminoma). Thus, germ cell tumour was thought to be the most likely primary aetiology.³ Tumour emboli are not infrequent, but are often microscopic^{4 5} and are missed frequently even with a CT pulmonary angiogram.⁶

The tumours that are frequently associated with tumour emboli are hepatomas, breast and renal carcinoma, gastric and prostatic cancers and choriocarcinomas.^{4 5} Since one of the lung nodules on the left side was peripherally situated, adjacent to the chest wall, an ultrasound-guided biopsy was performed. The histopathology revealed pleural tissue infiltrated by a tumour composed of sheets and cords of polygonal cells exhibiting increased mitotic activity, moderate nuclear pleomorphism, hyperchromatic nuclei and moderate amounts of an

Figure 1 Prechemotherapy chest X-ray.

eosinophilic cytoplasm. Immunohistochemistry showed positivity for placental alkaline phosphatase, α -fetoprotein and CD30. The pathological diagnosis showed metastatic germ cell tumour with a predominantly embryonal carcinoma pattern. The patient received four cycles of chemotherapy with cisplatin and etoposide and also underwent right inguinal orchidectomy. He was also started on low molecular weight heparin for pulmonary embolism. A follow-up CT of the chest after four cycles showed that the masses had resolved or reduced significantly in size with areas of scarring and cavitations (figure 4).

DISCUSSION

Germ cell tumours of the testis occur very rarely. Their prevalence is about 1% of all malignant neoplasms. Although malignant extragonadal germ cell

Figure 2 Prechemotherapy CT of the chest with multiple cannonball lesions.

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Figure 3 Prechemotherapy CT of the chest with pulmonary embolism in the right pulmonary artery.

tumours of the lung are extremely rare, their recognition is of clinical importance because of their curability.

This is the role model treatable tumour, which is chemosensitive and curable. Its cure rate is about 80% in disseminated diseases and 98% in localised diseases. Malignancy in general is a risk factor for pulmonary embolism, and this association is more important with germ cell tumours. There are two risk factors described in the literature which can predispose to pulmonary embolism in germ cell tumour.⁷ The first is a high body surface area and the second, an elevated serum LDH before chemotherapy.⁷ In our patient, the LDH level was very high, but his body surface area was normal at 1.48 m². Participants with no adverse factors had a 4% risk of thromboembolism. On the other hand, those with at least one risk factor had a 26% chance of thrombosis.^{8,9}

Figure 4 CT of the chest post chemotherapy.

The serum β -HCG is reliable as well as being a useful assay in the diagnosis and management of seminoma.⁶ In our index patient, β -HCG was high, and after chemotherapy its value became normal. Choriocarcinoma is a rare malignant tumour developing after pregnancy, with frequent metastases to the lungs; however, when the tumours embolise into the pulmonary arteries, they resemble pulmonary thromboembolism, making correct diagnosis difficult. Physicians must suspect this disease in cases of pulmonary embolism in women.¹⁰

Learning points

- ▶ Multiple round lesions in a young patient is a rare, metastatic malignancy that should figure in the differential diagnosis.
- ▶ Testicular examination may give a clue to the diagnosis in such patients.
- ▶ Germ cell tumours present with multiple large, well-defined cannonball lesions in the lungs.
- ▶ It is important to diagnose germ cell tumours because of their good response to treatment and potential curability.
- ▶ Germ cell tumours are associated with pulmonary embolism.
- ▶ Patients with malignancy who develop pulmonary embolism need long-term anticoagulation.

Competing interests None.

Patient consent Obtained.

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