Computed tomography manifestations of a malignant solitary fibrous tumour of the pleura with distinct blood supply from celiac trunk

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Abstract

Solitary fibrous tumours of the pleura (SFTPs) are rare and roughly 80% of them have a benign course. Malignant SFTPs are seldom reported, as are their computed tomography (CT) manifestations. We report the case of a 45-year old male patient who presented with coughing for over 2 months. A large lesion in his right hemithorax was found by chest X-ray. CT scan showed patchy areas and a sharp time-attenuation curve. CT angiography reconstruction revealed a distinct feeding vessel from celiac trunk. After surgery, the tumour was confirmed to be a malignant SFTP by immunochemistry.

Keywords: Chest • Pleura • Tumour

INTRODUCTION

Solitary fibrous tumours of the pleura (SFTPs) are rare neoplasms, roughly 80% of which are benign, that originate from mesenchymal cells [1]. They grow slowly, and usually present no symptoms other than local compression in late stages [2]. Often SFTPs are found incidentally by chest X-ray, and treated most prevalently with surgical resection [3]. We report a case of malignant SFTP with distinct blood supply from the celiac trunk, and particular computed tomography (CT) findings.

CASE REPORT

A 45-year old male was admitted to our Hospital with coughing for >2 months, and a large mass lesion in the right chest discovered (Fig. 1A and B) on X-ray. By CT, the lesion measured 13.1 × 10.3 × 7.8 cm and demonstrated mass effect on the adjacent lung (Fig. 1C and D). Local invasion was absent, as was lymphadenopathy. On plain CT, there were areas of relatively low attenuation (24–30 Hu) as well as other regions (33–40 Hu) located centrally and peripherally without calcification or haemorrhage (Fig. 1D). With enhancement, the heterogeneity was more apparent. The net increased CT values of relatively high attenuation areas of the lesion in 30, 65 and 180 s were, respectively, 39–42, 67–82 and 42–52 Hu, while no enhancement of the low attenuation areas on the plain scan occurred (Fig. 1E–G). Furthermore, on maximum intensity projection (MIP), convoluted vessels were seen within the tumour (Fig. 1H). To view the tumour coronally, multiplanar reconstruction (MPR) was applied. Mass effect on the adjacent liver was observed and the tumour was bean-shaped (Fig. 2A). Interestingly, coronal MIP revealed a feeding artery arising from the celiac trunk (Fig. 2B), and further CT angiography reconstruction (30 s after contrast injection) showed that a distinct large artery from the celiac trunk and a small artery from the hepatic artery were responsible for the blood supply (Fig. 2C). Posterolateral thoracotomy was performed, which revealed that the tumour was sessile, arising from the parietal pleura, and widely adhered to the thorax (the right lower lung, pericardium and esophagus) with a lobular surface. After dividing these adhesions, the tumour was en bloc resected completely. Histological examination revealed that the tumour consisted of spindle-shaped cells of low-grade neoplasm (Fig. 2D). Immuno-histochemical results showed CD34 negative, CD99 positive and bcl-2 positive. After surgery, the patient’s coughing was resolved. The patient declined adjuvant therapy and was discharged 9 days after surgery and advised to have a repeat CT scan 1 month later.

DISCUSSION

At first, the lesion was thought to be a bronchopulmonary sequestration for its particular coeliac blood supply; however, intralobar sequestrations are usually accompanied by pulmonary infection, while extralobar sequestrations are often accompanied by other congenital malformations, such as diaphragmatic hernia. In this case, not much evidence supported this consideration.

SFTPs are rare, mostly benign and asymptomatic [2]. However, malignant SFTPs may have unfavourable prognosis, with complications as metastasis and higher possibility of local recurrences [1].

To differentiate benign and malignant SFTPs, clinical presentation, pathological features and immunohistochemistry are often
referred [1]; immunohistochemistry in this case was CD34 negative and bcl-2 positive, which support the diagnosis of a malignant SFTP [2]. However, so far, CT appearance of malignant SFTPs has been rarely reported and often described as indistinguishable from benign SFTPs [1]. Typically, heterogeneity of enhancement appears in central areas with lower attenuation, which correlates with myxoid change, haemorrhage, necrosis or cystic degeneration [1]. However, in our patient, plain CT scan showed a lesion, in which low attenuation areas were found both centrally and peripherally, with or without enhancement (Fig. 1D and E). So we think this particular patchy appearance (both central and peripheral areas) of this tumour may be suggestive of its malignancy. In addition, malignant tumours usually grow so fast that they may have uneven growth speeds in different directions, leading to lobular surfaces.
Thus, the bean-shaped lesion we saw by MPR might also be suggestive of malignancy of this tumour (Fig. 2A).

Blood supplies of SFTPs are rarely reported, and it is the very first time we found SFTP blood supply from celiac trunk and hepatic artery (Fig. 2B and C). CT angiography reconstruction was invaluable in detecting blood supplies of tumours, especially vessels from distant area, and it contributes to preoperative preparations, such as preoperative embolization. Therefore, preoperative CT angiography, especially in case of tumours of great dimensions, which are heterogeneous at contrast-enhanced CT, should be considered by clinical physicians.

On contrast-enhanced CT scan, the net increased CT value was 39–42 Hu in arterial phase, suggesting blood supply from the aorta, which was confirmed by the following CTA reconstruction. In delayed phase, the net increased CT value was 42–52 Hu, suggesting rapid depletion of contrast materials. The net increased value of over 15 Hu is indicative of malignancy [4], and the narrow contrast wash-in/wash-out time window, resulting in a sharp time-attenuation curve, is a typical feature of hepatocellular carcinoma [5]. Thus, we believe the enhanced CT appearance in this case is also indicative of malignancy.

CONCLUSION

We report a malignant solitary fibrous tumour with a distinct feeding vessel from the celiac trunk. The particular patchy CT appearance (both centrally and peripherally) of this tumour and the sharp time-attenuation curve might be suggestive of its malignancy. More research in this area is needed.

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REFERENCES