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CASE REPORT

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Intrathoracic giant solitary fibrous tumor

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Data Interpretation D
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Background: Solitary fibrous tumor of the pleura is a rare, usually benign, and slow-growing neoplasm. Complete surgical resection for giant tumor of the pleura is challenging because of poor exposure and a large blood supply. We report the case of a giant hypervascular fibrous tumor that filled nearly the entire left hemithorax and anterior mediastinum, and its preoperative management.

Case Report: A 59-year-old woman presented to us with exertional dyspnea and chest pain. A chest radiograph showed the right hemithorax completely opaque and a mediastinal shift to the left hemithorax. A tomography scan of the thorax showed a giant mass that almost completely filled the right hemithorax and compressed the mediastinum to the left. Because of excessive bleeding during dissection, the operation was terminated after a biopsy specimen was obtained. The biopsy was diagnosed as a benign fibrous tumour. A thoracic computed tomography angiogram showed that the mass was supplied by multiple intercostal arteries as well as an aberrant artery that branches off the celiac trunk in the subdiaphragmatic region. Due to the many arteries that needed to be embolized, the final decision was to control the bleeding following resection by inducing total circulatory arrest with the help of cardiopulmonary bypass. The bleeding could not be controlled under cardiopulmonary bypass and the patient's death was confirmed.

Conclusions: We report this case to emphasize the necessity of preoperative embolization; the use of cardiopulmonary bypass and total circulatory arrest is not a valid alternative method to control the bleeding.

Key words: benign • intrathoracic • fibrous • giant tumor • benign tumors • solitary fibrous • tumors • therapy

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Background

Solitary fibrous tumor of the pleura is a rare intrathoracic neoplasm; about 80% originate in the visceral pleura and 20% in the parietal pleura. Many are pedunculated on pleural-based pedicles that contain in a large number feeding arteries and draining veins. They present as an asymptomatic mass, are usually large, and are benign in about 80% of patients [1]. The initial evaluation and surgical treatment are main topics in management. The tumor is fatal in 12% of cases due to its extensive intrathoracic growth [2]. Complete en bloc surgical resection is a commonly used treatment of this tumor.

Case Report

A 59-year-old woman presented to our clinic complaining of exercise dyspnea, chest pain, and inability to lie on her left side. On posterior-anterior chest X-ray, the right hemithorax was completely opaque and there was a mediastinal shift towards the left side. On the thoracic computed tomography (CT) image, there was a giant heterogeneous mass that almost completely filled the right hemithorax and pushed the heart to the left and the diaphragm downwards (Figure 1). Routine chemistry and hematology lab test results were normal. Arterial blood gas analysis results were PaO2 65 mmHg and PaCO2 42 mmHg. Lung function test results were forced expiratory volume in 1 second 37% and forced vital capacity 36%. The decision was to surgically manage the patient, thus median sternotomy was performed. Due to excessive bleeding, the surgery was terminated after a biopsy specimen was obtained. The pathology exam revealed a benign fibrous tumor. The thoracic CT angiogram showed that the mass was supplied by multiple intercostal arteries, as well as an aberrant artery that branches off the celiac trunk in the subdiaphragmatic region (Figure 2). The initial plan was to interrupt the arterial supply by embolization to control the bleeding during the operation. Due to of the many arteries that needed to be embolized, the final decision was to control bleeding following resection by inducing total circulatory arrest with the help of cardiopulmonary bypass.

Following femoral artery and vein catheterization in the supine position, the thorax and mediastinum were exposed

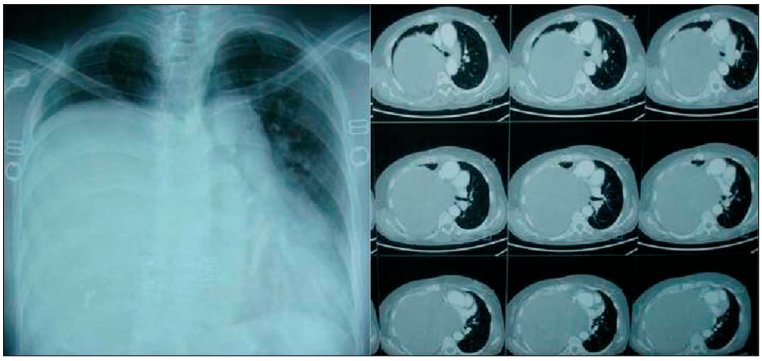

Figure 1. Initial chest radiograpy showing, the right hemithorax was completely opaque and there was a mediastinal shift towards the left side. On the thoracic computed tomography (CT) image, there was a giant heterogeneous mass that filled the right hemithorax almost completely and pushed the heart to the left and the diaphragm downwards.

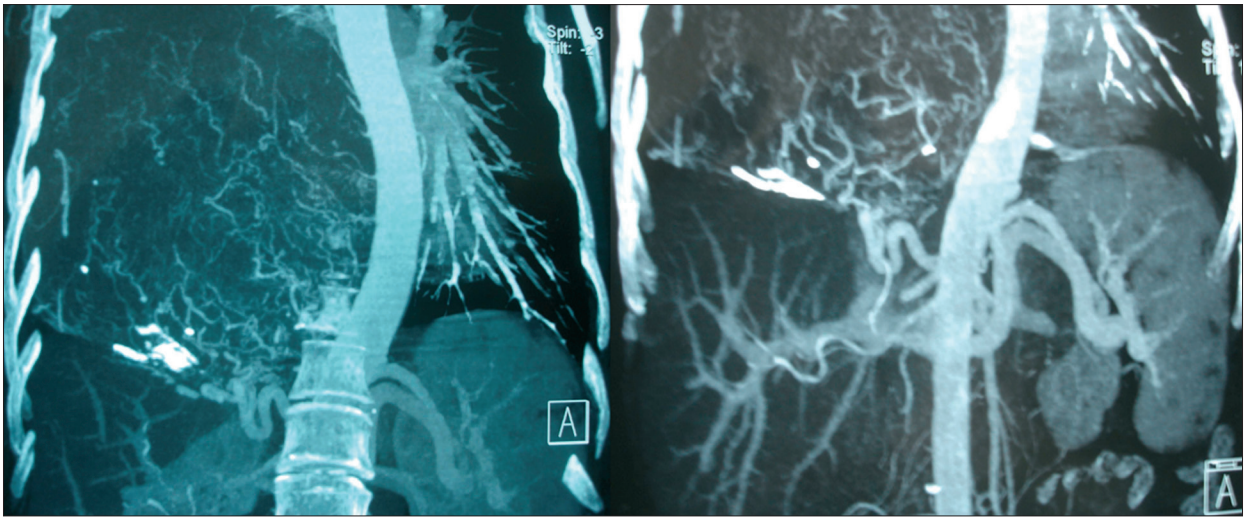

Figure 2. The thoracic CT angiogram showing that the mass was supplied by multiple intercostal arteries as well as aberrant artery that branches off the celiac trunk in the subdiaphragmatic region.

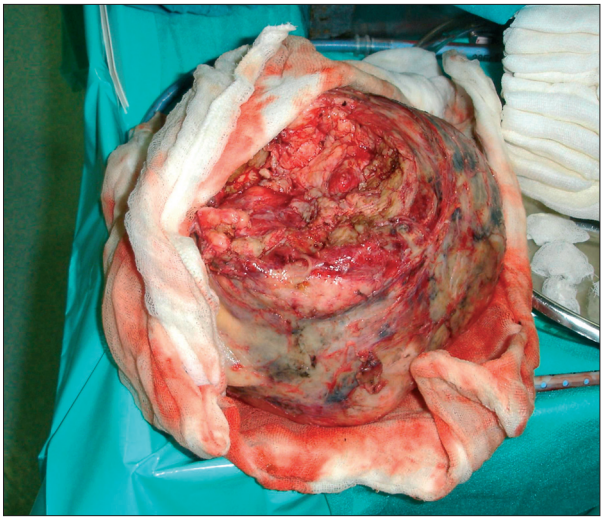

Figure 3. The gigantic encapsulated solitary tumor of the pleura, weighed 2870 g and measured 25×18×15 cm

using a Clamshell incision. Cardiopulmonary bypass was initiated and the cooling process was started. At 32°C, a cross-clamp was placed on the ascending aorta and cardiac arrest was induced by antegrade cold-blood cardioplegia. The patient was cooled to 17°C. The hypervascular tumor that invaded the mediastinum was completely removed under low-flow total circulatory arrest. There was blood leakage from the entire thoracic and diaphragmatic surface but no vascular supply was identified. Bleeding was controlled using electrocautery. After the patient was warmed and separated from the total circulatory arrest, the entire thoracic and diaphragmatic surfaces started to bleed profusely. The bleeding could not be controlled under cardiopulmonary bypass. Patient death was confirmed. The resected specimen was 25×18×15 cm and 2.870 g (Figure 3).

Discussion

Solitary fibrous tumor of the pleura may have grown to giant size by the time of diagnosis. About 80% of these tumors originate in the visceral pleura and 20% arise from parietal pleura. Tumors more than 8 cm are more likely to have a parietal pleural origin and have a vascular pedicle [1–3]. Identifying the vascularity of the giant intrathoracic mass using a CT angiogram can be useful in the surgical management. For intrathoracic hypervascular tumors, interrupting the vascularity using embolization may decrease the amount of intraoperative bleeding and improve the safety of the procedure in suitable cases [4–6].Total circulatory arrest is routinely used in open-heart surgeries today. This technique has also been used to decrease the risk of massive bleeding in the treatment of patients who have an intracranial aneurysm, resection of a major hepatic artery, or other tumors [7–10].Our decision to perform the resection under circulatory arrest was made on the basis of 2 facts: risk of uncontrollable bleeding, and the many arteries that needed to be embolized.

Conclusions

Highly vascular tumors should be resected after interrupting the vascularity using embolization. The use of cardiopulmonary bypass and total circulatory arrest is not a valid alternative method to control bleeding in cases such as ours.

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