A Huge Non-Invasive Thymoma Causing Acute Dyspnea

NORIAKI TSUBOTA, AKIHIRO MURATANI and MASAHIRO YOSHIMURA

Department of Thoracic Surgery, Hyogo Medical Center, Akashi 673


We report a patient with an extra-ordinarily huge thymoma weighing 1,930 g and measuring 21 × 20 × 15 cm that filled almost the entire hemithorax. The tumor was successfully removed and the patient made a good recovery. Despite of its large size, the tumor was benign both clinically and histologically, and the pathological diagnosis was epithelial thymoma of non-invasive type. The perioperative changes of this patient’s lung function are discussed in detail.

giant thymoma; non-invasive thymoma; lung collapse

Thymoma is considered to be a potentially malignant tumor and its staging is defined by the extent of invasion into the surrounding tissues (Bernatz et al. 1961; Masaoka et al. 1981). We report a patient with a very large thymoma that severely compressed the left lung and mediastinum, and almost completely filled the left hemithorax. Despite its large size, this tumor was benign.

CASE

A 48-year-old woman was admitted to a hospital with severe dyspnea. She had not been subjected to clinical examination for many years. A chest x-ray film and magnetic resonance imaging revealed a large tumor in the left hemithorax, severely compressing the left lung (Figs. 1, 2). A tentative diagnosis of malignant mesothelioma was made by percutaneous needle biopsy. Subsequently, chemotherapy with 100 mg of cisplatin was delivered via a bronchial artery. She was introduced to our clinic for exploratory thoracotomy, because there was no improvement after this therapy.

On admission, she looked critically ill and the pulse rate was 99 at rest. The vital capacity was 870 ml and the FEV₁₀ was 610 ml. Blood gas analysis revealed PaO₂ of 68.7 mmHg and PaCO₂ of 48.2 mmHg on room air.

Total resection of the tumor was accomplished via median sternotomy with anterolateral thoracotomy, and the intraoperative blood loss was 4,500 ml. The tumor was shown arising from the left lobe of the thymus and was densely adherent to the surrounding structures but was not invasive. It measured 21 × 20 × 15 cm and weighed 1,930 g. Histological examination revealed that it was an epithelial thymoma (Fig. 3). The left

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Address for reprints: Noriaki Tsubota, M.D., General Thoracic Department, Hyogo Medical Center, 13-70 Kitaokji, Akashi, Hyogo 673, Japan.

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lung, collapsed and edematous would not respond to positive pressure ventilation, but it was not removed in some expectation of eventual functional recovery.

She recovered smoothly after the operation. At the time of discharge one month later, the vital capacity was 1,300 ml, the FEV₁₀ was 1,210 ml, and the DLco was 10.3 ml/min/mmHg. However scintiscanning revealed only 1.0% ventilation and 1.3% perfusion on the affected side. However, the lung function gradually improved; the vital capacity rose to 1,620 ml, the FEV₁₀ to 1,330 ml, and the DLco to 19.58 ml/min/mmHg by the fourth

Fig. 1. Preoperative chest x-ray film shows a mass filling almost the entire left hemithorax with mediastinal shift.

Fig. 2. MR imaging reveals a tumor, which is solid and potentially resectable. a, frontal plane; b, sagittal plane.
Fig. 3. Photomicrograph showing a typical epithelial thymoma.

Fig. 4. A chest x-ray film obtained in the 4th postoperative year reveals good re-expansion of the left lung.
postoperative year. Re-expansion of the left lung was evident on chest x-ray film (Fig. 4) and ventilation ratio of the left lung on scintiscanning increased to 18.3% with 15.9% perfusion.

DISCUSSION

Thymoma has a variety of unique clinical and pathological features. In a report from the Mayo Clinic, one of the largest series of thymoma in the literature, a total of 283 patients were studied (Lewis et al. 1987), where the size of the tumors ranged from 1.7 cm to 20 cm. The maximum weight reported in other studies was 920 g in 51 patients (Legg and Brady 1965), 1,200 g in 63 patients (Wilkins et al. 1966) and 918 g in 138 patients (Bernatz et al. 1961). The largest thymoma recorded in the literature had dimensions of $34 \times 18 \times 16$ cm and weighed 5,700 g, it arose in a 15-year-old boy, but remained non-invasive like our patient's tumor (Smith et al. 1970).

Microscopically, thymoma is classified as lymphatic, epithelial or mixed types (Masaoka et al. 1981). The epithelial type is considered to be more invasive than the lymphatic type. Generally, the larger the thymomas, the more invasive it does become.

However, our patient's tumor remained non-invasive despite its huge size. Also the largest case cited above was also reported to be of epithelial type.

Another interesting aspect of our case is concerned with the affected lung which during the operation did not respond to positive pressure ventilation. However, it regained function after a very long time, as revealed by scintigraphy in the 4th postoperative year. Concerning the restoration of function of a collapsed lung, there have been several interesting reports. Logeais et al. (1970) reported a case whose lung restored function eight years after collapse. We have also experienced one case in which the middle and lower lobes collapsed for 2 months due to tuberculosis of the right main bronchus unfolded following right upper sleeve lobectomy (Tsubota et al. 1988). The reconstructed lobes almost fully re-expanded and began to function even during the operation, unlike the very slow recovery in the present case. The involved lobes in the previous case of us had no inflammatory or fibrotic changes, while in the present case there appeared to be fibrosis in the collapsed lung, since stiffness was noted during intraoperative positive pressure ventilation. We think however, that the minimal inflammation of the lung allowed slow functional recovery to occur. In the case in Smith's report, decortication had to be added for restoration of the lung on the 13th days after the initial operation.

References


