

## —Report on Experiments and Clinical Cases—

## A Case of Chronic Expanding Hematoma Presenting as a Huge Mass in the Pleural Cavity

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### Abstract

We report a case of a huge chronic expanding hematoma completely removed by surgery. A 71-year-old man was found to have a 3-cm-diameter round nodule in the posterior mediastinum seven years previously. He was not administered any treatment because he did not have any other serious symptoms. There was nothing in his history that could be related to his present condition, such as thoracic surgical treatment or tuberculosis. The massive tumor in the left pleural cavity grew, compressing the left lung and heart gradually in the past seven years. Cytological examination of a needle biopsy specimen showed only erythrocytes with a few infiltrating inflammatory cells. Moreover, his preoperative histopathological analysis did not reveal any significant findings. Therefore, he underwent complete resection of the hematoma including the fibrous capsule and left lower lobectomy. Severance of abundant new vascularizations caused massive bleeding. The postoperative course was uneventful. There was no recurrence in the two years. In cases of gradual growth of a mass without indications of malignancy, we should consider the existence of a chronic expanding hematoma even in patients without a history of thoracic operation or tuberculosis. (J Nippon Med Sch 2002; 69: 282–285)

**Key words:** hematoma etiology, hematoma surgery, thoracic tumor

### Introduction

Chronic expanding hematomas first advocated by Reid et al.<sup>1</sup> occur in various locations. In most cases, the hematoma continues growing slowly as a space-occupying mass for long periods after surgical treatment or injury. There are some reports of a huge mass presenting as chronic expanding hematoma in the pleural cavity after thoracic injury, thoracic surgery or tuberculous pleuritis<sup>2,3</sup>. In general, the first choice of treatment is complete removal, but it is not

easy because of abundant new vascularizations beneath the capsule and the presence of a fibrous hard adhesion to the chest wall, diaphragm and lungs. Massive bleeding during separation of adhesion is occasionally dangerous to patients. Therefore, it is necessary to resect affected neighboring organs in some cases. Moreover, in some cases, operative therapy has serious effects on cardiac and pulmonary function due to compression of the mediastinum and lungs<sup>4</sup> and on coagulation systems<sup>5</sup> due to chronic repeated bleeding. Evaluation of whether a patient's condition permits invasive surgery is important.

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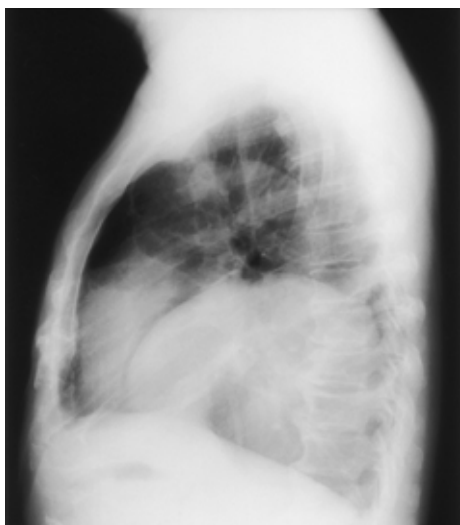


Fig. 1 Chest X-ray on admission. The huge mass occupies the left pleural cavity with the silhouette visible in the mediastinum.

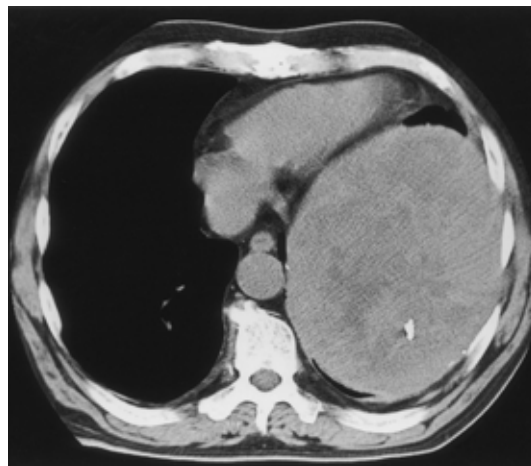


Fig. 2 Chest computed tomography shows a clear bordered round mass. Inside are two mixed densities extending to the parietal pleura with calcification, and the mass of 17.2×13×12 cm in size in the left pleural cavity compressed the left lung parenchyma and heart.

Herein, we report a case of chronic expanding hematoma presenting as a huge mass surgically removed completely.

### Case Report

A 71-year-old man, who had been a heavy smoker, was found to have a 3-cm-diameter round nodule in the posterior mediastinum suspected to be a diaphragmatic hernia seven years ago. He had taken some medications for hypertension and diabetes as secondary diseases for fifteen years. He had no history of thoracic surgical treatment and at 18 years old he had an unknown pleuritis without tuberculosis. No special treatment had been administered for

this nodule, but he had had left chest dull pain recently. This time at a hospital near his house he was suspected of having a renal stone, and for the purpose of more detailed examination, he was transferred to our hospital. He was diagnosed as having right renal carcinoma, 4 cm in diameter. In a preoperative survey he was found to have a huge mass of 17.2×13×12 cm in size in the left pleural cavity, compressing the left lung parenchyma and heart by chest X-ray (Fig. 1) and chest computed tomography (CT). Chest CT (Fig. 2) showed a clear bordered round mass, and inside there were two mixed densities extending to the parietal pleura with calcification. By means of CT-guided needle biopsy, it was found that there was only a fibrous connective tissue with

fibrin infiltrated with a few small lymphocytes and neutrophils. Cytological examination of the biopsy specimen revealed only erythrocytes with a few inflammatory cells. Routine laboratory results and levels of tumor markers were within the normal range. There were no signs of infection or malignancy. Although we could not reach a conclusive diagnosis despite the detailed examinations, our preoperative diagnosis was as follows: chronic empyema, teratoma, or aneurysmal bone cyst. With the permissible values of hemodynamics and respiratory functions, his general condition also indicated that he could tolerate the operation. He initially underwent nephrectomy of the right kidney. Pathological diagnosis was clear cell renal cell carcinoma without vascular invasion. Atypical grading was grade 1 (G1). Pathological stage was T1N0M0, stage I. About three weeks later, he underwent extirpation of the huge mass. A posterolateral thoracotomy along the 6<sup>th</sup> intercostal space with combined partial resection of the 6<sup>th</sup>, 7<sup>th</sup> and 8<sup>th</sup> anterior rib was performed for the purpose of obtaining a wide operative field. A thickened and hard capsule covered the entire mass. Severance of abundant new vascularizations caused massive bleeding. The total blood loss was 4,480 ml. Fortunately, we were able to find a layer at which we could separate and free the huge mass from the parietal pleura in one procedure. The site of contact of the mass was of an amorphous and brownish material with ossification. Moreover, the diaphragm appeared to be functional, which could be very beneficial during the perioperative course and the postoperative recovery with respect to pulmonary function. Subsequently, a left lower lobectomy was performed revealing organizing atelectasis of the left lower lobe due to compression by the huge mass for long periods. We could resect the huge mass including the capsule completely. The total operation time was 392 minutes. Macroscopic observations showed that the resected mass (**Fig. 3**) was a white-brownish fragile tissue covered with partial fibrous capsule containing ossiform materials. Pathological examination showed a hematoma with calcification surrounded by dense fibrous tissues and the center of the hematoma was consisted of fresh and old hemorrhages, necrotic debris and fibrin. But microvessels beneath

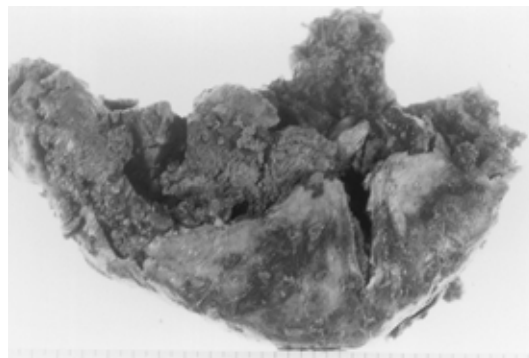


Fig. 3 Macroscopic findings of the tumor. White-brownish huge fragile necrotic encapsulated mass with hemorrhagic and ossified materials

the fibrous capsule were not clear. There was no evidence of bacterial and tuberculous infection or malignancy. His postoperative course was uneventful without any complications. About two years post-operation, there is no sign of recurrence.

### Discussion

Chronic expanding hematoma can occur in various locations. Reid et al.<sup>1</sup> reported it as paracecal, scrotal, intramuscular, renal and rectus abdominis hematoma. There were seven cases of hematoma occurring in the pleural cavity after tuberculous pleuritis and empyema reported by Harada et al.<sup>3</sup> In most cases, hematoma in the pleural cavity occurs after thoracic surgery for long periods. This mass in the pleural cavity is considered to be a specific type of chronic empyema, or an organizing empyema<sup>6</sup>. The lesion is usually nonpurulent and has no evidence of bacterial infection. Our patient also showed fibrous encapsulated hematoma including organized tissue without signs of bacterial infection.

The growth mechanism of such hematomas is still unclear. One possible mechanism is that microscopic hematomas forming after the initial hemorrhage do not resolve naturally, and slowly grow due to repeated organization and hemorrhage from new fragile microvessels beneath the fibrous capsule. Various blood factors and degradation products that have inflammatory properties, including clotting factors, degraded leukocytes, platelets, fibrin, erythrocytes, and crystalline cholesterol, are possibly associated with repeated hemorrhage from fragile microvessels

resulting in inflammation<sup>17</sup>. Respiratory movements and constant coughing under a negative pleural pressure favor the growth of hematomas.

Generally, the first choice of treatment is complete surgical resection of the hematoma together with the capsule. Incomplete removal sometimes leads to recurrence<sup>4</sup>. However, abundance of new vascularizations and presence of a hard fibrous adhesion prevent complete removal. Even if preoperative treatment of thrombosis of the bronchial artery is performed, it can not successfully prevent massive bleeding (6,000 ml)<sup>4</sup>; the total blood loss in this case was 4,480 ml and a massive blood transfusion was required. Moreover, in some cases, in order to complete removal of hematoma, resection of affected neighboring organs is performed. Fortunately in our case, we were able to find a layer between the hematoma and the parietal pleura followed by the complete removal of the huge mass, but the left lower lobe, which showed organizing atelectasis due to compression for long periods, was also resected. The diaphragm was left intact. The residual lungs showed a good expansion postoperatively. Evaluation of the preoperative general condition is important. Some cases are reported to have decreased respiratory and cardiac functions due to compression and abnormality of the coagulation system due to repeated bleeding<sup>4,5</sup>. However, laboratory findings in our case were almost within the normal range. So we decided to perform extirpation of the huge mass because of his recent complaints and request for operation.

At this time it was difficult to make an accurate diagnosis of the condition. The huge tumor in our patient was at first considered to be a metastatic thoracic tumor from renal carcinoma. However, it could not be considered a metastatic tumor from pathological examinations of renal carcinoma, which showed clear cell carcinoma (G1) without vascular invasion, pT1N0M0. In general, the prognosis is favorable<sup>8,9</sup>. Moreover, preoperative pathological and cytological examinations of the huge tumor indicated no signs of malignancy. Cytological examination revealed mainly erythrocytes. We highly suspected chronic empyema including chronic expanding hematoma from a chest CT which showed two mixed

densities with calcification. The macroscopic features with ossification are indicative of chronic empyema, teratoma, or aneurysmal bone cyst<sup>10</sup>. However, microscopic observation revealed encapsulated mixed fresh and old hematoma with calcification. There was no signs of bacterial or tuberculous infections.

We assume that the hematoma of our patient was due to reactive pleural effusion of unknown cause. We should consider the existence of a chronic expanding hematoma even in patients without a history of thoracic surgical treatment and tuberculosis.

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