

Lung Adenocarcinoma Presenting as a Bleeding Sternal Mass

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ABSTRACT

A 53-year-old man with bleeding from a sternal mass associated with a toxic syndrome. Computed tomography (CT) revealed a destructive sternal mass, bilateral pleural effusion and an endobronchial lesion in the right middle lobe bronchus. Immunohistopathological study of an incisional biopsy confirmed metastatic lung adenocarcinoma.

Keywords: Chest Wall; Lung-Cancer; Sternal Tumors; Chest Wall Tumors

1. Introduction

Tumors of the chest wall are uncommon and consequently are not seen frequently in clinical practice [1]. Malignant chest wall masses arising from a primary focus in the lung (metastatic lung cancer) are rare [2]. Metastatic tumors typically occur in patients with advanced stages of the disease [3].

2. Case Report

A 53-year-old man presented with a 3-week history of dyspnea and an ulcerated bleeding lesion on the anterior chest wall, accompanied by weight loss and fatigue. The lesion had appeared a year earlier and it had been continuously growing. The patient was a heavy drinker and smoker of 1000 cigarettes/year. Physical examination revealed a well-defined polilobulated sternal lesion of approximately 10 cm diameter, hard and painless on palpation, attached to the deep planes, with active bleeding **Figure 1**.

Pulmonary auscultation detected diminished breath sounds in the left hemithorax. Cardiac auscultation was normal. Painless hepatomegaly (4 - 5 cm, soft) was found during the abdominal examination. The blood test results showed hyponatremia (116 mEq/L) with a plasma osmolality of 243 mOsm/kg.

The urine test identified a sodium level of 34 mmol/l with an osmolality of 295 mOsm/kg.

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Chest X-ray **Figure 2** showed bilateral pleural effusion.



Figure 1. Macroscopic image of the bleeding sternal mass.



Figure 2. Chest X-ray-Bilateral pleural effusion.

Based on the above-mentioned results the study was completed as follows:

Thoracentesis: negative for malignant cells.

CT scan of the chest and abdomen **Figure 3**: it confirmed a large sternal mass of $11 \times 8 \times 10$ cm with bone destruction and signs of soft tissue involvement. There were enlarged supraclavicular, axillary and mediastinal lymph nodes, together with bilateral pleural effusion and endobronchial lesion in the middle lobe bronchus.

Fiber-optic bronchoscopy: no endobronchial lesions were identified and cytology was negative for malignancy.

Positron emission tomography (PET): abnormal uptake in the sternal mass and supraclavicular and cervical lymph nodes. There were multiple regions with abnormal uptakes: in the right iliac crest, the left inferior pubic ramus, apophysis L5, the bilateral scapular region, the posterior costal ribs, the femur, the right tibia and the cortical femoral diaphyses suggestive of metastasis.

Biopsy of the chest wall mass **Figure 4**: an opened biopsy was performed under local anesthesia. Pathological diagnosis was metastatic adenocarcinoma. The immunohistochemistry results were consistent with the

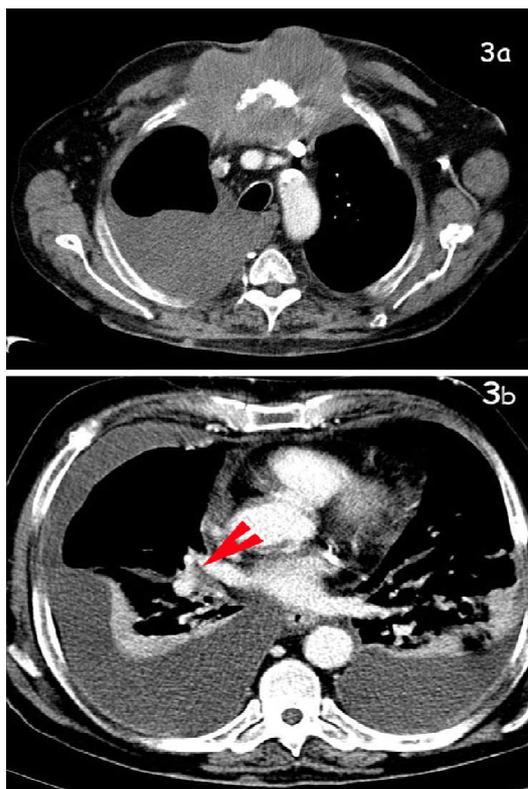


Figure 3. Axial CT scan. (a) A large sternal mass with destructive pattern and involvement of soft tissue associated with bilateral pleural effusion; (b) Endobronchial lesion at the origin of the middle lobe bronchus caused by hypodense mass which is compatible with neoplastic process (red arrow).

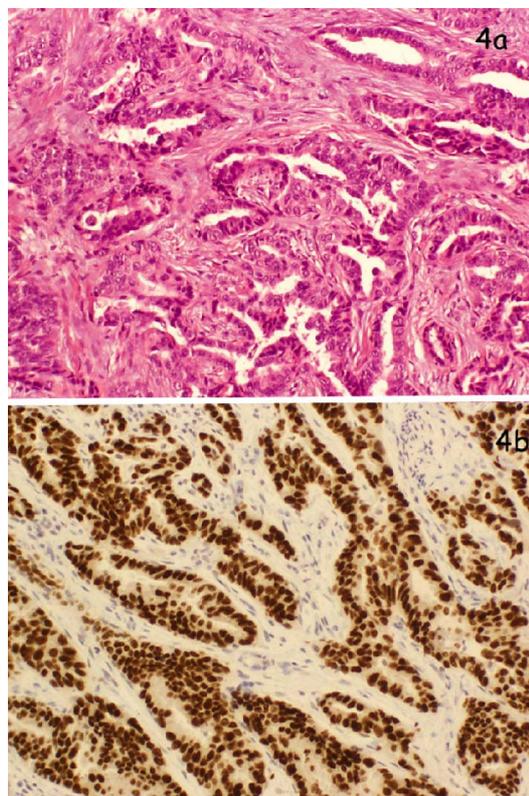


Figure 4. (a) Well differentiated adenocarcinoma showing a predominantly acinar pattern (H/E, 20 \times); (b) Immunohistochemical study was positive for TTF-1 (Thyroid Transcription Factor) (H/E, 20 \times).

pulmonary origin of the tumor.

Based on the diagnosis of metastatic lung adenocarcinoma, the multidisciplinary team agreed not to proceed with the resection. Due to continuous bleeding from the sternal mass, hemostatic radiotherapy (40 Gy) was applied to the tumor bed. The patient did not evolve favorably and died after two months from diagnosis.

3. Discussion

There are several types of sternal masses: primary tumors, 1% (chondrosarcoma, osteogenic sarcoma, Ewing's sarcoma); metastatic tumors, 60% - 70% (breast, lung, kidney and thyroid); direct invasion, 5% - 10% (lymphoma, bronchogenic carcinoma); and benign tumors, 2% - 3% (osteomyelitis, sternal fractures with hyperostosis and eosinophilic granuloma) [4].

The sternal metastases are usually caused by hematological dissemination or by direct extension due to parasternal lymph node involvement, being the most common breast cancer [1,4].

The clinical history is the most important means to differentiate benign and malignant lesions [1]. Clinically speaking the patient showed acute localized pain on breathing and on pressing the tumor area. Bleeding of the

sternal tumor was due to ulceration and also to local hypervascularity.

Radiographic findings in the sternal abnormalities are often nonspecific. A specific diagnosis of sternal abnormalities can be suggested on the basis of CT and MR characteristics [5]. Imaging studies were useful to assess local tumor extension and mediastinal lymph node involvement. Sometimes these tumors may display an iceberg effect, with an internal component bigger than the external one [1].

The treatment plan will depend on pathological diagnosis [6], tumor extent and involvement of adjacent structures. Treatment may include surgery, chemotherapy and radiotherapy or their combination. For localized primary tumors of the sternum, partial or total resection provides good results [7]. The choice of surgical technique depends on a number of factors, of which the most important is the size and the site of lesions [8]. Myocutaneous flaps and prosthetic materials greatly facilitate reconstruction after massive chest wall resection [7,8]. On the other side, the preferred treatment for hematological tumors, like malignant lymphoma, is chemotherapy, however surgical intervention is required for diagnosis and treatment in cases where the diagnosis is not obvious [9].

REFERENCES

- [1] D. B. Groff III and P. C. Adkins, "Chest Wall Tumors," *The Annals of Thoracic Surgery*, Vol. 4, No. 3, 1967, pp. 260-281. [doi:10.1016/S0003-4975\(10\)66510-1](https://doi.org/10.1016/S0003-4975(10)66510-1)
- [2] E Toussiot, E. Gallinet, B. Auge, L. Voillat and D. Wendling, "Anterior Chest Wall Malignancies. A Review of Ten Cases," *Revue du Rhumatisme*, Vol. 65, No. 6, 1998, pp. 397-405.
- [3] Y. S. Hyun, H. S. Choi, J. H. Bae, D. W. Jun, H. L. Lee, O. Y. Lee, B. C. Yoon, M. H. Lee, D. H. Lee, C. S. Kee, J. H. Kang and M. H. Park, "Chest Wall Metastasis from Unknown Primary Site of Hepatocellular Carcinoma," *World Journal of Gastroenterology*, Vol. 12, No. 13, 2006, pp. 2139-2142.
- [4] M. Martínez-Galdámez, C. González-Hernando, P. Fraga-Rivas and y M. Martínez-Ruiz, "Tumoración Esternal y Dolor Torácico. Sternal Mass and Chest Pain," *Medicina Aeroespacial y Ambiental*, Vol. 2, No. 6, 2007, pp. 77-79.
- [5] T. Franquet, A. Giménez, X. Alegret, E. Sanchís and A. Rivas, "Imaging Findings of Sternal Abnormalities," *European Journal of Radiology*, Vol. 7, No. 4, 1997, pp. 492-497. [doi:10.1007/s003300050190](https://doi.org/10.1007/s003300050190)
- [6] S. Haraguchi, M. Hioki, M. Takushima, K. Yanagimoto, K. Koizumi and K. Shimizu, "Metastatic Chest Wall Tumor Suspected to Be of Lung Origin by Immunoreactivity for Cytokeratin 7 and 20," *Japanese Journal of Thoracic and Cardiovascular Surgery*, Vol. 54, No. 3, 2006, pp. 132-136. [doi:10.1007/BF02744878](https://doi.org/10.1007/BF02744878)
- [7] R. O. Dingman and L. C. Argenta, "Reconstruction of the Chest Wall," *The Annals of Thoracic Surgery*, Vol. 32, No. 2, 1981, pp. 202-208.
- [8] S. I. Daliakopoulos, M. N. Klimatsidas and R. Korfer, "Solitary Metastatic Adenocarcinoma of the Sternum Treated by Total Sternectomy and Chest Wall Reconstruction Using a Gore-Tex Patch and Myocutaneous Flap: A Case Report," *Journal of Medical Case Reports*, Vol. 4, 2010, p. 75. [doi:10.1186/1752-1947-4-75](https://doi.org/10.1186/1752-1947-4-75)
- [9] N. Nishiyama, K. Inoue, S. Nakatani, H. Hamba and H. Kinoshita, "Malignant Lymphoma Presenting as a Large Mass in the Anterior Chest Wall," *Osaka City Medical Journal*, Vol. 46. No. 2, 2000, pp. 105-110.