



## CASE REPORT

# Diagnostic pitfall in a large cell lung cancer with testicular metastasis synchronous malignant pleural mesothelioma patient: A case report

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## Abstract

Large cell lung cancer metastases to the testis are scarce, although it is the most common malignancy and the most common site of metastases for breast, colorectal and kidney cancers. We hereby report a 28-year-old male patient admitted to our hospital with a chief complaint of scrotal enlargement, accompanied by chest pain and progressive dyspnea. The definite diagnosis was malignant pleural mesothelioma with the synchronous occurrence of large cell lung cancer with testicular metastasis. Sophisticated clinical manifestation of symptoms led to a time-consuming diagnosis, while the patient's condition deteriorated rapidly. Herein, we present this case to share our hard-learned experience to increase clinician awareness and contribute to the information in the literature.

## KEYWORDS

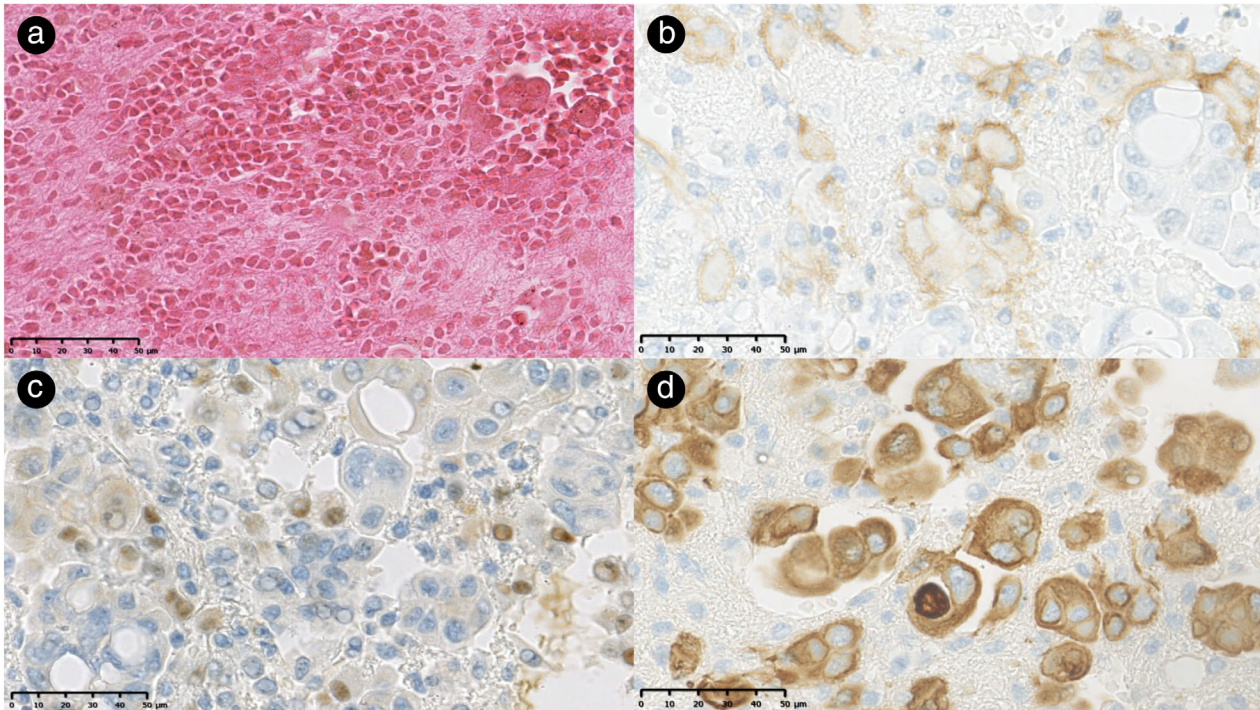
large cell lung cancer, malignant pleural mesothelioma, testicular metastasis

## INTRODUCTION

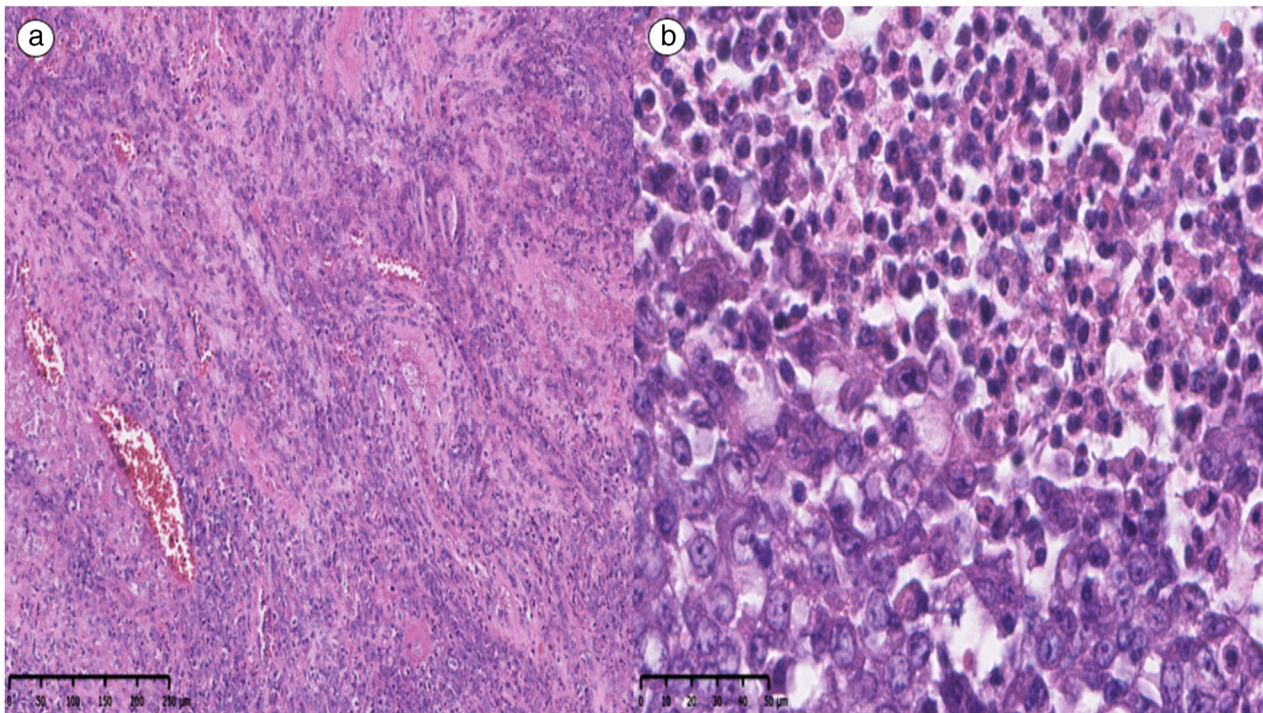
Lung cancer is responsible for approximately a quarter of all cancer-related deaths.<sup>1,2</sup> Metastasis to the brain, bones, adrenal glands, and liver are thought to be more common sites of non-small cell lung cancer (NSCLC), whereas some rare sites of metastases have been reported to be the spleen and mandibular bone,<sup>3-5</sup> testicular metastasis from NSCLC is quite unusual. To date, few cases of lung cancer with metastasis to the testis and synchronous malignant pleural mesothelioma have been reported. Here, we present a case of a large cell carcinoma of the lung manifested as metastasis to the testis and synchronous malignant pleural mesothelioma. To our knowledge, this case is quite rare, and the first of its type reported in the literature.

## CASE REPORT

A 28-year-old male presented to our Urology Clinic with a complaint of enlargement and discomfort of the right scrotum for 6 months, accompanied by chest pain and dyspnea. Six months earlier, he had discovered a mass over his right scrotum of the size of about 1 × 1 cm. He was admitted to a local hospital as he had experienced intermittent stabbing pain over the chest region and shortness of breath. The symptoms of dyspnea had been aggravated while he was participating in an antituberculosis treatment trial for 1 month. He had neither a history of smoking nor any comorbidities. Initial physical examination revealed an enlarged and swollen right scrotum and a palpable and tender mass of size 5 × 6 cm as well as an immobilized nodule in the right



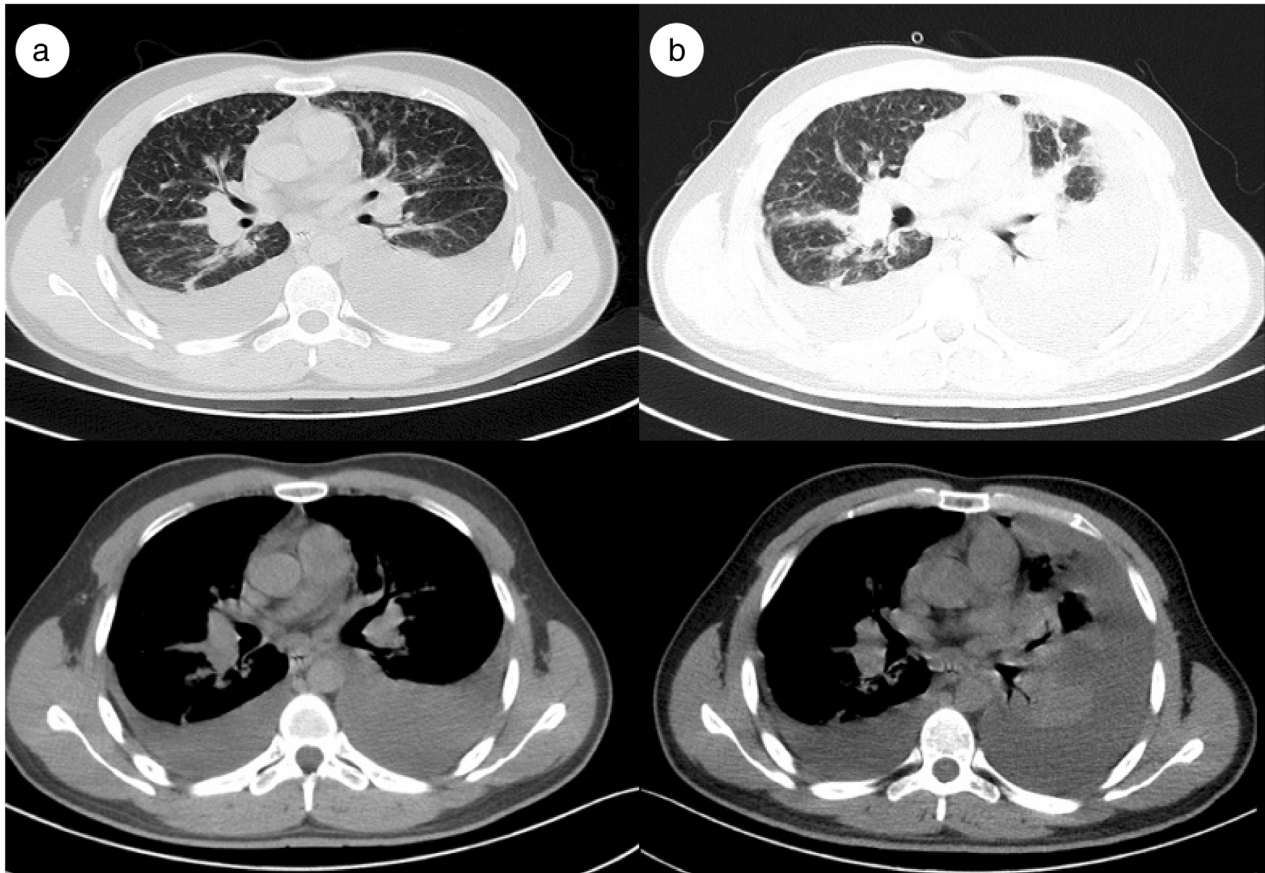
**FIGURE 1** (a) Nest of malignant pleural mesothelioma, hematoxylin and eosin (H&E). Figures 1b to d show representative immunohistochemistry images of malignant pleural mesothelioma cytology sections were positive, (b) D2-40/podoplanin, (c) Wilms tumor-1, WT-1 and (d) pancytokeratin (PCK) (original magnification, 40x).



**FIGURE 2** Histology of testicular metastasis (a) hematoxylin and eosin (H&E), 10x, (b) H&E, 40x.

inguinal canal region. Baseline thoracic computed tomography (CT) scan showed bilateral hydrothorax, segmental atelectasis, and mediastinal lymph node enlargement. Ultrasound showed

that the right testis was enlarged (size  $5.0 \times 3.5 \times 3.4$  cm) possessing enriched blood flow. Tumor markers were AFP 1.57 ng/ml, CEA 13.00 ng/ml, CA-125 1437 U/ml, CA74-4



**FIGURE 3** Perioperative thoracic computed tomography scan. (a) Baseline thoracic computed tomography (CT) scan showing bilateral hydrothorax, atelectasis and obstructive pneumonia. (b) Postoperative thoracic CT scan indicating bilateral hydrothorax increased.

68.37 U/ml, CYFRA21-1 13.57 ng/ml, NSE 16.83 ng/ml,  $\beta$ -HCG 7.19 mIU/ml. Thoracentesis was performed for the purposes of relief of dyspnea and cytological examination. Hydrothorax cytopathology showed the beta-HCG value was 7.19 mIU/ml, CEA 3.90 ng/ml, NSE 34.89 ng/ml, and CYFRA21-1 ng/ml. Hydrothorax immunohistochemistry (IHC) analysis (Figure 1) showed that the tumor cells were positive for calretinin, D2-40, WT1, EMA, pancytokeratin (PCK), glut-1, desmin, but negative for P16, carcinoembryonic antigen (CEA), GPC-3, CD117, CD30, AFP, HCG, PLAP, OCT3/4, SALL-4. Periodic acid-Schiff stain (PAS) and Alcian blue stain (AB) stain was negative for differential diagnosis of tuberculosis. A diagnosis of malignant pleural mesothelioma was made. In addition, the testicular mass was a suspicious metastasis which made the treatment a dilemma. Due to the rapid growth of the right testicular mass, orchiectomy was suggested after a multidisciplinary meeting for further diagnosis and treatment purposes. Sectioning examination found that the testis, epididymis and spermatic cord had a fish-meat appearance. IHC revealed that the tumor cells were positive for PCK, CK7, EMA, VIM, CEA, Syna, CgA, SALL4, Ki-67/MIBI, negative for p63, INI-1, TTF-1, napsin A, OCT3/4, CD30, CD117, inhibin, PLAP, HCG, AFP, WT1, CR, D2-40, GPC-3, CD45, HMB-45, S-100 and desmin (Figure 2). A definite diagnosis of large cell lung cancer with testicular metastasis and malignant pleural mesothelioma was made.

Unfortunately, the patient passed away due to respiratory failure caused by two malignant cancer-related atelectasis, pneumonia, and hydrothorax (Figure 3).

## DISCUSSION

Metastatic cancer of the testis is rare and the incidence of testicular cancer in young males is scarce but fatal.<sup>6</sup> Over 90% of testicular neoplasms are derived from the mature testis epithelium forming germ cell tumors, and of the remainder, only about 5% are derived from cells that assist in the development and maturation of sperm forming gonadal stromal tumors.<sup>7</sup> Epididymitis and testicular torsion account for the most common cases with organic causes in emergencies and urological clinics.<sup>8</sup> Differentiation of diagnosis between active pleural tuberculosis and thoracic malignancy has always been tricky, as over 60% of patients initially misdiagnosed with cancer had focal pulmonary tuberculosis. The case for comorbidities of tuberculosis and cancer has also been previously reported.<sup>9-11</sup>

The initial treatment for this patient was based on diagnostic and treatment purposes, to resolve the progressive right testicular enlargement and shortness of breath. Multiple pathology tests from pleural fluid indicated malignant mesothelioma, and a postoperative pathological biopsy of

the right testicle revealed it was large cell lung cancer with testicular metastasis. However, the possibility of both types of mixed tumors should be considered. While making differential diagnoses for testicular masses in patients, the rare possibility of metastatic tumors to the testis should also be considered, particularly if serum germ cell tumor markers are normal or mildly deranged.<sup>12</sup> This complication in diagnostic testing calls for a thorough investigation in males with unidentified scrotum and testicular abnormalities. The first impression of this patient was enlargement of the scrotum, which was subsequently overwhelmed by the emerging dyspnea. At the first visit, the patient limited his complaint to the scrotum and testicles, which restricted the physician's thorough investigation, and thus misled them to miss a better opportunity for an overall inspection and early diagnosis. Malignant pleural mesothelioma is a common cause of unilateral pleural effusion, lung cancer should also be considered, and early diagnosis is of great significance for the treatment of patients and improving their quality of life.<sup>13</sup>

In conclusion, we report a rare case of large cell lung cancer with testicular metastasis and malignant pleural mesothelioma. Physicians should be aware of the possibility of multiple malignant tumors in young and adult patients who present with pleural effusion. It should also be noted that in cases involving lung cancer, a multidisciplinary approach is necessary to achieve optimal survival and quality of life for patients.<sup>14</sup> As the differentiation between tumors and TB yield great challenges, decisions of diagnostic treatment should be made with prudence and merit close attention.<sup>15</sup>

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#### CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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