Lung Adenocarcinoma Metastatic to an Indirect Inguinal Hernia Sac: A Case Report and Literature Review

Hui-Yu Lin¹ Chun-Hou Liao¹,² Yu-Wei Chou¹,*

An inguinal hernia is a common medical condition in daily practice. Indeed, the lifetime prevalence of inguinal hernias is 47% in patients > 75 years of age, but it is rare to have metastatic cancer of an inguinal hernia sac. Most cases of intraperitoneal malignant inguinal hernias arise from the gastrointestinal tract. Extraperitoneal inguinal metastases most commonly occur in males with testicular cancer; there have been no reported cases that have metastasized from lung adenocarcinoma. Here we report a 77-year-old male with possible cancerous peritonitis that led to the finding of metastases in a hernia sac. The patient presented with disease progression after chemo-radiation therapy with multiple metastases to the liver and bone. This report highlights the importance of a pathologic evaluation of the inguinal hernia sac in preventing misdiagnosis.

Key words: Adenocarcinoma metastasis, Hernia sac, Inguinal hernia, Lung cancer

INTRODUCTION

Inguinal hernias are one of the most common medical conditions in surgical practice, but it is rare to have metastatic cancer in an inguinal hernia sac. Although few cases of metastatic cancer in an inguinal hernia sac have reported in review articles, no metastases from lung adenocarcinoma have been reported. Based on the report herein, lung adenocarcinoma metastasis should be considered when a patient has a clear history of lung cancer, even when the origin is distant from the inguinal area.

Case report

A 77-year-old Asian male with type II diabetes mellitus and essential hypertension for decades presented with a right inguinal painless mass for > 1 year. He reported no change in bowel habits. He also reported right groin pain and right lower abdomen tenderness, which first developed 1 week prior to an evaluation by a urologist. The physical examination revealed a painful, regularly-shaped, fixed, non-reducible bulging mass in the right inguinal area. The tentative diagnosis was an inguinal hernia. To rule out an incarcerated inguinal hernia, an abdominal CT was arranged, which...
showed a hepatic hemangioma and right inguinal hernia with a small segment of small bowel in the herniation sac (Fig. 1). Intra-operatively, indirect hernia sac should be smooth in texture, but this case with multiple pieces of yellow granule-like tissue seeding the internal ring were noted, it feels grainy and which originated from the abdomen and was confirmed by opening the sac, The opened sac extruded ascites in the form of turbid, serous fluid.

Surprisingly, special immunostaining of the sac showed the following: thyroid transcription factor (TTF)-1 and cytokeratin (CK)-7 were strongly positive; CK-20 was focally positive; CDX-2 was negative; and PAS and mucin staining were also positive.

Further study showed that among tumor markers, only CEA was elevated. Stool occult blood testing was negative. PSA was within the normal range. Plain chest films showed a patch with faint opacity over the right upper lung. Chest computed tomography revealed a 7 x 4.4 cm mass in the right lung. Bronchoscopy demonstrated stenosis of the orifice of the right B2 bronchus due to external compression. Biopsy and brushing were performed over the mucosa. The patient underwent video-assisted thoracic surgery (VATS) decortication with a pleural biopsy, and the pathology showed poorly differentiated adenocarcinoma metastatic to the pleura. The pathologist reviewed the microscopic slides of the bronchial brushing and biopsy, and found extreme similarity between the morphology of adenocarcinoma and the ingunal hernia sac. Based on medical history of the patient and clinical findings, the metastatic adenocarcinoma was thought to originate from the right lung. Although peritoneal signs were limited to the right lower quadrant, the final diagnosis was right lung adenocarcinoma with metastasis (stage T4N0M1). The patient presented with disease progression after chemo-radiation therapy with multiple metastases to the liver and bone. The patient died after 3 years of follow-up.
Lung adenocarcinoma in inguinal hernia sac

Discussion

An inguinal hernia is a common medical condition with a lifetime prevalence as high as 47% in patients > 75 years of age[8]. Malignant masses in the inguinal canal appear in < 0.5% of excised sacs[1]. Accordingly, the metastatic tumor described in this case can be classified as a saccular hernia sac tumor[10]. The most common cause of saccular tumors is metastases from abdominal malignancies[1]. Malignant mesotheliomas, cecal adenocarcinomas, colon cancer, prostate cancer, adult granulosa cell tumors, gastric cancer, and retroperitoneal liposarcomas have been diagnosed incidentally within the inguinal canal based on published reports[1,7,10]. Most intraperitoneal malignant inguinal hernias arise from cancers of the gastrointestinal tract; it is not uncommon to find advanced sigmoid colon cancer metastases within an inguinal hernia sac[2]. In extraperitoneal cancers, testicular cancer is the most common origin of extraperitoneal inguinal metastases in males, while ovarian cancer is the origin of most common extraperitoneal inguinal metastases in females[9]. Prostate adenocarcinoma with metastases to the inguinal sac after radical prostatectomy have also been reported[16]. These cancers have direct contact with the posterior wall of the inguinal canal, which made local tissue invasion more likely[5]. Distal lung metastases to the inguinal canal has not been reported, thus this is the first reported case of metastatic lung cancer to the inguinal canal. In this case, the use of CK7/CK20 and TTF-1 may be helpful in distinguishing between primary and metastatic pulmonary adenocarcinoma[11]. Primary pulmonary adenocarcinoma would be expected to show CK7+/CK20-/TTF-1+[3,6]. TTF-1 is very important in distinguishing between primary and metastatic lung adenocarcinoma because most primary lung adenocarcinomas are TTF-1-positive[4,11-13].

The patient might have had cancerous peritonitis, which would enable the cancer cells to spread to the hernia sac. To distinguish cancerous peritonitis from gastrointestinal adenocarcinoma, CDX-2 was stained and was shown to be negative. Therefore, origin from the lung was a greater possibility[6].

The systemic therapy is the primary approach to the management of metastatic lung cancer, and therapy directed against specific sites of disease.

Figure 4. Special staining of lung adenocarcinoma metastatic to the inguinal area was CDX-2-negative (400x).

Figure 5. Special staining of lung adenocarcinoma metastatic to the inguinal area was TTF-1-positive (400x).
may also play an important role. In this situation, surgical resection or definitive radiation therapy of the metastatic disease may produce durable benefit\[17\]. The most frequent sites of such metastases are the brain and the adrenal gland\[18\]. The final outcomes in the treatment of patients with lung cancer depends upon the cell type (non-small cell versus small cell), tumor stage, molecular characteristics, and an assessment of the patient's overall medical condition\[19\]. This report highlights the importance of evaluation of inguinal hernia sacs in aiding the correct diagnosis and preventing misdiagnosis.

**Reference**

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肺腺癌轉移至腹股溝疝氣：病例報告及文獻回顧

林惠鈺 1  廖俊厚 1,2  周有偉 1,*

腹股溝疝是在我們醫療工作中，是一種相當常見的疾病。在患者的年齡超過了75歲的族群中，其終生患病率約為47%，但其病因非常罕見的是由癌症轉移所致。而大多數腹膜惡性腫瘤轉移至腹股溝疝多是來自胃腸道。在非腹膜惡性腫瘤轉移中，睾丸癌是最常見的腹膜外腹股溝轉移，但是從來沒有一例報告是從肺腺癌轉移。患者可能有惡性腫瘤轉移而引發腹股溝疝氣。這份報告提醒我們的腹股溝疝病理評價的重要性。否則，潛在的病理可能被錯過。

關鍵字：肺癌轉移，腹股溝疝氣