# Non-small cell lung cancer presenting as "psoas muscle syndrome": A case report

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## Abstract

Lung cancer is the leading cause of cancer-related death worldwide and majority of patients are diagnosed in advanced/metastatic disease stage. Sites of distant metastases mainly include contralateral lung, lymph nodes, brain, bones, adrenal glands and liver; skeletal muscles metastases (SMMs) are less common. Psoas muscle and diaphragm metastases are mainly found during autopsy, as their involvement commonly is asymptomatic. We report a case of a 60-year-old female, suffering from non-small cell lung cancer (NSCLC), with refractory lower back pain, as expression of malignant psoas syndrome (MPS). MPS is a rare and difficult-to-treat cancer-pain syndrome, unresponsive to majority of analgesic therapy, related to psoas muscle metastasis; it is usually caused by different tumors such as uterus, ovary, bladder, prostate, colon-rectum, lymphoma, melanoma and sarcoma and represents an uncommon finding in NSCLC patients.

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## Introduction

Worldwide, lung cancer is the primary cause of cancer-related death for both women and men. Major risk factors for development of lung cancer include tobacco smoking and environmental pollution [1,2]. Despite progresses in diagnostic procedures [3-9], early diagnosis is difficult to achieve due to the absence of a screening program and poor specificity of symptoms mimicking other respiratory disease. As a result, lung cancer often presents as a metastatic disease and surgical treatments are offered in a minority of patients [10-12]. The most common sites of metastatic spread are: regional lymph nodes, brain, bones, adrenal glands and liver. Hematogenous skeletal muscles metastases ($SMM_s$) are less common. $SMM_s$ are generally painful [13,14] and represent a not rare finding during autoptic detection, with an estimate prevalence ranging from 0.8 to 16% [15,16]. Psoas muscle and diaphragm metastases are commonly silent in patients and therefore mainly found on autopsy [17]. Psoas muscle involvement may exhibit a broad range of clinical presentations: from asymptomatic forms to malignant psoas syndrome (MPS), a devastating cancer-pain syndrome, unresponsive to multimodal treatment. MPS is caused by different tumors such as uterus, ovary, bladder, prostate, colon-rectum, lymphoma, melanoma and sarcoma [18]. Clinical presentation of MPS caused by NSCLC is very uncommon [19]. We describe a case of a 60-year-old woman admitted to our Department for progressive dyspnea and left leg pain.

## Case Report

A 60-year-old female patient was admitted in our hospital with refractory lower back and left leg pain and progressive dyspnea. She was a heavy smoker (40 pks/year) with a clinical history of uterine fibroid, microcytic anemia and surgical resection of a benign right breast nodule. Chest x-ray and contrast-enhanced CT scan revealed a solid inhomogeneous mass at right hilum, occluding the right upper and middle bronchus (Figure 1). At the presentation, the tumor showed regional spread causing mediastinal lymphadenopathy and pericardial effusion. Metastatic spread also involved adrenal glands, kidneys and pancreas. Multiple SMMs were detected and affected anterior dentate muscle, bilateral paraspinal muscles, left femoral rectus muscle, bilateral minor gluteus muscle; left psoas muscle was completely substituted by an enormous metastasis measuring about 20 cm of diameter (Figure 2). Bronchial biopsy confirmed NSCLC, large cells

anaplastic type (Figure 3). To manage lower back pain, high doses of analgesics and opioids (morphine up to 60mg/die) were used with little relief due to recurrent breakthrough pain episodes. A continuous intravenous infusion of morphine, through elastomeric pump, was introduced, gaining a mild pain control. As the patient's general conditions rapidly deteriorated (P.S.ECOG=4), active cancer treatment, such as systemic chemotherapy or radiotherapy, resulted unfeasible. The patient died after 30 days from admission in our hospital.

## Discussion

Lung cancer survival in metastatic disease remains poor despite therapies [20-22]. Understanding key signaling pathways involved in lung cancer growth and malignant progression [23-29] is crucial for development of innovative treatment options. Skeletal muscles are a hostile environment for metastatic cells and for this reason muscular metastasis are not so common and usually discovered at autopsy. Several mechanisms counteract the metastatic muscular spread, such as fibers contraction, lactic metabolism and temperature, blood flow and pH variations [30]. At presentation, SMMs appear like nodules or masses with clinical and radiological features similar to abscess, soft tissue neoplasms, infection and hemorrhage [31]. According to retrospective case series [13,17,32], most frequently involved sites are diaphragm, psoas, buttock muscles and the intercostal muscles. Within lung tumors, NSCLC is the most frequent histotypes [13,14].

Our report shows a rare case of large cell carcinoma presenting with MPS. This syndrome was first recognized as a distinct cancer pain syndrome in 1990 by Stevens and Gonet [33]. It refers to a proximal lumbosacral plexopathy, painful fixed flexion of the ipsilateral hip, associated with malignant involvement of the psoas major muscle by metastatic cancer by TC or biopsy. About 30 cases of MPS are reported in literature. MPS is a rare and challenging cancer pain state that is often refractory to polymodal analgesic therapy due to its double nature, being both neuropathic and nociceptive. The diagnosis is postulated in presence of one or more diagnostic criteria (ipsilateral nociceptive pain, ipsilateral proximal neuropathic pain, psoas muscle spasm) in association with psoas major muscle involvement detected by CT scan. Several agents have been proposed to control neuropathic and nociceptive pain such as drugs (opioids, neuropathic and anti-inflammatory

**Figure 2. Left psoas muscle metastatic mass.**

**Figure 1. Solid mass at right hilum with irregular outline; right upper and middle bronchus obstruction with atelectasis.**

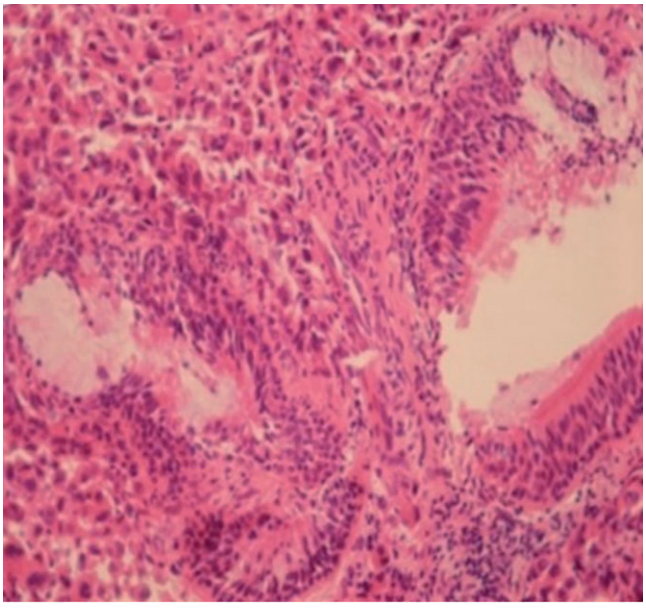

**Figure 3. Lung biopsy showing anaplastic large-cell carcinoma.**

agents, muscle relaxant), radiotherapy, nerve blocks or spinal analgesia and surgery [19,34]. Douglas *et al*. [34] using boluses of anesthetic *via* a psoas sheath catheter and Takase [35], using methadone, obtained a dramatic improvement of pain state. However, the correct management is still unclear due to the lack of recommendations or guidelines on treatment of the symptoms and further studies are required.

## Conclusions

The occurrence of a psoas metastasis represents an event which may worsen prognosis in cancer patients including lung cancer. When SMMs lead to MPS, as in our case, pain control may be difficult to achieve and the clinical picture becomes dominated by unbearable pain.

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