

Retroperitoneal metastatic poorly differentiated carcinoma with β -human chorionic gonadotropin secretion presenting as a psoas abscess

A case report and review of the literature

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Abstract

Rationale: Psoas abscesses generally arise from a contiguous intra-abdominal or pelvic infectious process or hematogenous spreading of bacteria. The serum β -human chorionic gonadotropin has been used to detect normal or ectopic pregnancy. It also can be utilized in following up carcinomas.

Patient concerns: Here, we reported a case of a 47-year-old woman who presented with a left psoas mass presumptively diagnosed as an abscess secondary to lumbar tuberculosis. In addition, the patient had abnormal increase of β -human chorionic gonadotropin. The computed tomography (CT) scan and magnetic resonance imaging (MRI) showed that the 5th lumbar vertebral infection or tuberculosis with left psoas abscess. CT-guided percutaneous biopsy, surgical exploration and biopsy, and ¹⁸F-FDG (fluorodeoxyglucose) positron emission tomography-CT (PET-CT) were used to make a definite diagnosis. The sigmoidoscopy and biopsy were used to further diagnose.

Diagnoses: The biopsy of left psoas demonstrated metastatic or infiltrating poorly differentiated carcinoma with secretion of β -human chorionic gonadotropin. The subsequent pathological examination of neoplasm showed the same pathologic morphology.

Interventions: Appropriate treatment of infected retroperitoneal mass, systematic chemotherapy and cancer biotherapy for metastatic poorly differentiated carcinoma were taken.

Outcomes: Interventions provided little help until the patient died of secondary infection and multiple organ failure.

Lessons: This case represents an extremely unusual clinical presentation of metastatic poorly differentiated carcinoma with secretion of β -human chorionic gonadotropin presenting as a psoas abscess. Physicians also need to sharpen their awareness of the potential malignant carcinomas mimicking psoas abscess.

Abbreviations: β -HCG = β -human chorionic gonadotropin, CT = computed tomography, MRI = Magnetic Resonance Imaging, NSE = neuron specific enolase, PET-CT = Positron Emission Tomography - Computed Tomography, SCC = squamous cell carcinoma antigen.

Keywords: β -human chorionic gonadotropin, biopsy, malignant carcinoma, metastasis, psoas abscess

1. Introduction

Psoas diseases are usually caused by bacterial, fungal, parasitic, and viral inflammation, hematoma, and tumors.^[1–3] Primary psoas abscess has always been related to tuberculosis

infection and mainly caused by bacteria in hematogenous dissemination. Secondary psoas abscesses originate from perforated intestinal organs, intestinal neoplasms, and urogenital neoplasms.^[4–6] Moreover, the serum β -human chorionic gonadotropin (β -HCG) has been used to detect normal or ectopic pregnancy. It can also be utilized in diagnosing trophoblastic tumors.

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BW and WL have contributed equally to this work.

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2. Case presentation

A 47-year-old female presented to the clinic complaining of left buttock pain and swelling of left lower limb that had persisted for 2 weeks. She stated the only thing that alleviated the pain was lying on her right side or flexing her knees.

On physical examination, she demonstrated local tenderness of left costovertebral angle and a positive psoas sign. Her ultrasound examination of uterus and attachments showed adenomyosis. The biopsy of cervix demonstrated chronic cervicitis with squamous metaplasia and cervical intraepithelial neoplasia of grade 1. Laboratory tests, including sex hormone, white blood cell, erythrocyte sedimentation rate, C-reactive protein, and human leukocyte antigen B27, were within normal range. A computed tomography (CT) scan showed low density in the left of 5th lumbar vertebral and vertebral pedicle with local

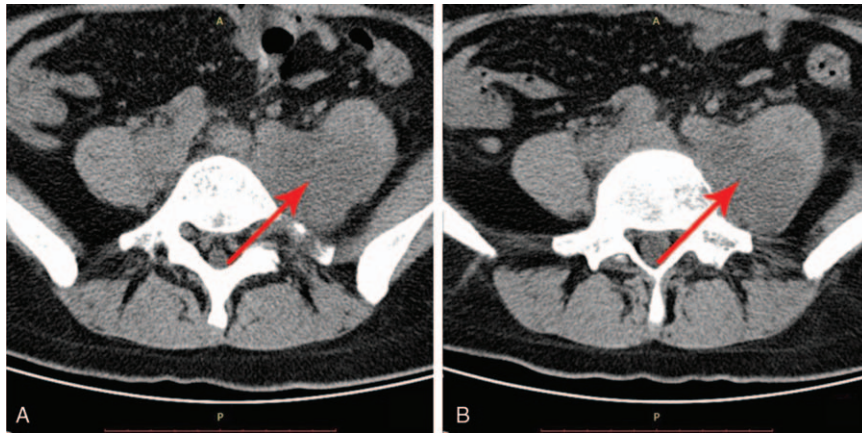


Figure 1. Lumbar computerized tomography shows mass in left psoas. The arrow of image A and image B showed low density in the left of 5th lumbar vertebral and vertebral pedicle with local destruction of the adjacent cortex and swelling of the left psoas with ill-defined low-density mass. (CT attenuation value 16HU, maximum cross-section: 5.4 cm × 4.0 cm). The differential diagnosis of the CT scan findings was the 5th lumbar vertebral infection or tuberculosis (TB) with left psoas abscess.

destruction of the adjacent cortex and swelling of the left psoas with ill-defined low density mass (CT attenuation value 16 HU, maximum cross-section: 5.4 cm × 4.0 cm). The differential diagnosis of the CT scan findings was the 5th lumbar vertebral infection or tuberculosis with left psoas abscess (Fig. 1). On magnetic resonance imaging (MRI), long T1 and T2 signal was displayed in the left of 5th lumbar vertebral, and a mass (6.9 cm × 4.1 cm) with soft tissue signal was shown in the left psoas. The diagnosis of the MRI scan findings might be the tuberculosis infection with cold abscess (Fig. 2). So, she was presumptively diagnosed as an abscess secondary to lumbar tuberculosis.

But further examination revealed that erythrocyte sedimentation rate and C-reactive protein, the *Mycobacterium tuberculosis* antigens (LAM, 38 kDa and 16 kDa), and T-spot were negative. Her laboratory workup showed the following results: ferroprotein was 287.7 μg/L, β-HCG was 1076.6 international units per liter, squamous cell carcinoma antigen (SCC) was 2.0 ng/mL, CYFRA21-1 was 9.20 ng/mL, and neuron-specific enolase (NSE) was 17.77 μg/L. So, pregnancy was considered, but the ultrasound

examination of uterus and attachments in menopause 37 and 47 days showed no gestational sac.

CT-guided percutaneous biopsy extracted 10 mL of sterile purulent/serous fluid. Microbiological examination revealed no general bacterial or *M. tuberculosis*. The failure of medical therapy and percutaneous drainage necessitated surgical exploration and biopsy. The subsequent pathological examination of the necrotic muscle demonstrated metastatic or infiltrating poorly differentiated carcinoma with secretion of β-HCG and large necrosis (Fig. 3A and B). Higher magnification showed the poorly differentiated neoplastic cells with hyperchromatic nuclei, epithelioid feature, and secretion of β-HCG. Even though a large number of immunohistochemical results were carried out [PCK(+); CK8/18(+); CK5/6(+); Vim(+); EMA(±); HCG-β(+); CDX2(±); INI-1(+); CD30(-); S-100(-); LCA(-); CK7(-); CK20(-); Villin(-); TTF-1(-); HMB45(-); MelanA(-); PAX8(-); PAX-2(-); GATA-3(-); ER(-); PR(-); HER2(-); P40(-); SALL4(-); SMA(-); Des(-); CD34(-); P63(-); Inhibin-α(-); Hpl(-); ERG(-); Calretinin (-)], the poorly differentiated neoplastic cell could hardly be distinguished the source of those cells.

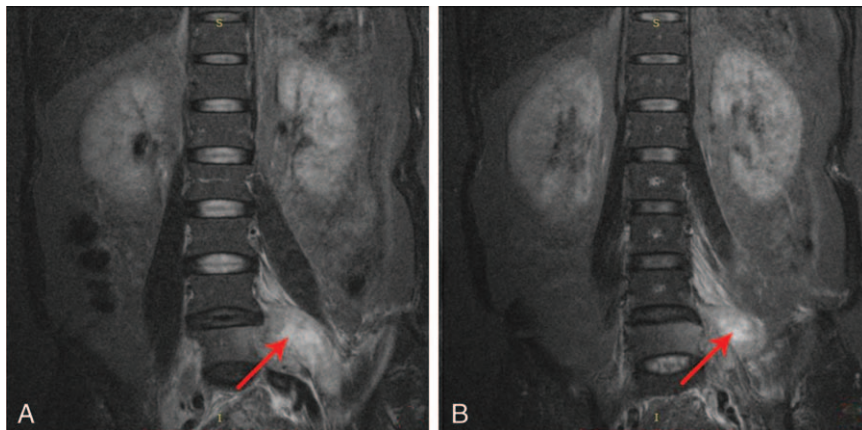


Figure 2. Magnetic resonance imaging shows mass in left psoas. The arrow of image A and image B showed a mass with soft tissue signal in the left psoas. Long T1 and T2 signal was displayed in the left of 5th lumbar vertebral, and a mass (6.9 cm × 4.1 cm) with soft tissue signal was shown in the left psoas. The diagnosis of the MRI scan findings maybe the TB infection with cold abscess.

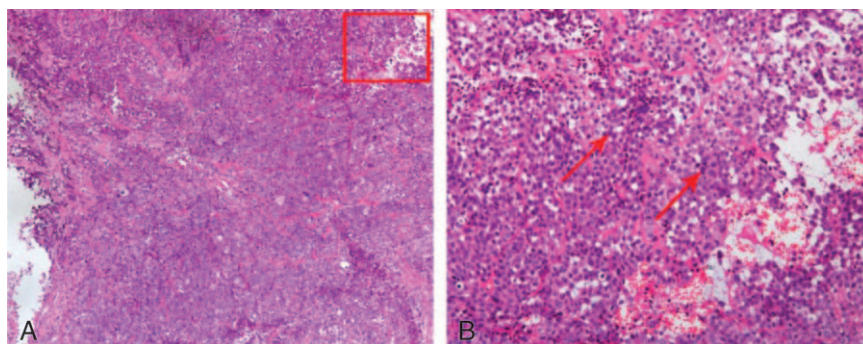


Figure 3. The pathological examination of the necrotic muscle. (A) Poorly differentiated neoplastic cell, hematoxylin and eosin stain; original magnification $\times 40$; (B) The arrows showed the poorly differentiated neoplastic cells with hyperchromatic nuclei and a high nucleocytoplasmic ratio. Hematoxylin and eosin stain; original magnification $\times 100$. Immunohistochemical: PCK(+*); CK8/18(+); CK5/6(+); Vim(+); EMA(\pm *); HCG- β (+);CDX2(\pm); INI-1(+); CD30(-*); S-100(-); LCA(-); CK7(-); CK20(-); Villin(-); TTF-1(-); HMB45(-); MelanA(-); PAX8(-); PAX-2(-); GATA-3(-); ER(-); PR(-); HER2(-); P40(-); SALL4(-); SMA(-); Des(-); CD34(-); P63(-); Inhibin- α (-); Hpl(-); ERG(-); Calretinin(-) * +=positive, \pm =slight positive, - =negative.

The β -HCG follow-up in menopause 42 and 48 days were 2499.2 and 10,279.8IU/L, respectively. In addition, ^{18}F -FDG (fluorodeoxyglucose) positron emission tomography-CT (PET-CT) showed that the left sigmoid colon wall thickening with hypermetabolic foci, indicating a possibility of underlying malignant tumor (Fig. 4A). Multiple lymph nodes in pelvic cavity and internal iliac with hypermetabolic foci and bone destruction of left extremitas sternalis clavaculaeta with locally hypermetabolic foci indicated a metastatic lesion (Fig. 4B and C). Moreover, PET-CT showed left psoas and iliopsoas were swelling with low density and heterogeneous hypermetabolic foci, and the differential diagnosis of PET-CT findings was infection, malignant lesions, or a combination of both (Fig. 4D).

Upon further sigmoidoscopy, sigmoid colon neoplasm was found in 20 to 22 cm from the anus. The subsequent pathological

examination of neoplasm showed the undifferentiated or poorly differentiated carcinoma with secretion of β -HCG and large necrosis (Fig. 5). The immunohistochemical study showed that PCK (+); CK8/18 (+); HCG- β (+); CK20 (\pm); Vilin (+); CDX-2 (-); CK7 (-); CgA (-); CD56 (-); Syn (-); CD117 (-); Dog-1 (-). Taking the PET-CT, clinical features, the pathological examination of sigmoid colon neoplasm and immunohistochemical study into account, this undifferentiated or poorly differentiated neoplastic probably originated from colon. Moreover, the image of the pathological examination of sigmoid colon neoplasm showed some poorly differentiated pancreatic structures.

After appropriate treatment of her infected retroperitoneal mass, this patient underwent systematic chemotherapy for metastatic poorly differentiated carcinoma. After 2 weeks of systematic chemotherapy, the neoplastic cells were not sensitive

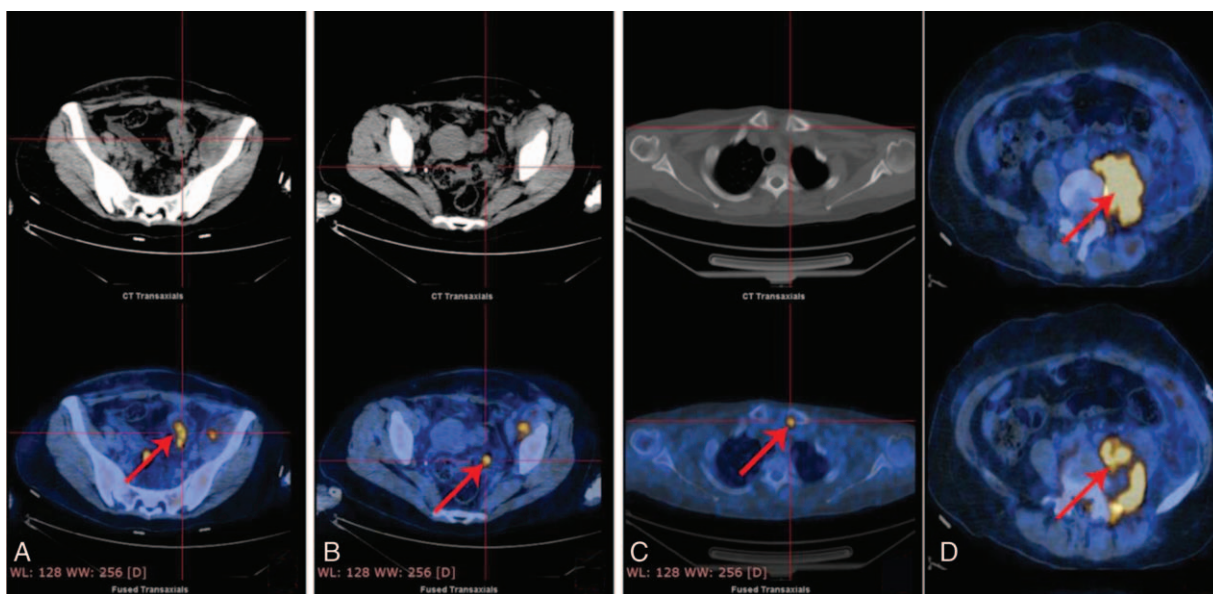


Figure 4. ^{18}F -FDG (fluorodeoxyglucose) positron emission tomography - computed tomography. (A) The arrow showed the sigmoid colon wall thickening with hypermetabolic foci and abnormal radioactivity concentration. (B) The arrow showed the multiple lymph nodes in pelvic cavity with hypermetabolic foci and abnormal radioactivity concentration. (C) The arrow showed the bone destruction of left extremitas sternalis clavaculaeta with locally hypermetabolic foci and abnormal radioactivity concentration. (D) The arrows showed the swelling psoas and iliopsoas with low density, heterogeneous hypermetabolic foci, and abnormal radioactivity concentration.

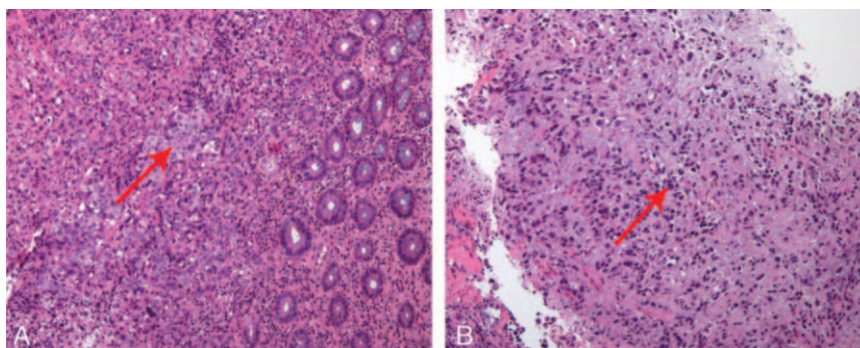


Figure 5. The pathological examination of the sigmoid colon neoplasm. (A,B) The arrows showed the poorly differentiated tumor cells, hematoxylin and eosin stain; original magnification $\times 100$. Immunohistochemical: PCK(+); CK8/18(+); HCG- β (+); CK20(\pm); Villin(+); CDX-2(-); CK7(-); CgA(-); CD56(-); Syn(-); CD117(-); Dog-1(-).

to chemotherapeutic drugs. Cancer biotherapy was chosen, but it provided little help until the patient died of secondary infection and multiple organ failure.

This research was approved by the Institutional Review Board (IRB) of Union Hospital, Tongji Medical College, Huazhong University of Science and Technology. All procedures in the retrospective study were in accordance with the ethical standards of the IRB of Union Hospital and with the Helsinki Declaration.

3. Discussion

This case represented an extremely unusual clinical presentation of metastatic poorly differentiated carcinoma presenting as a psoas abscess. Retroperitoneal tumors are hard to diagnose before surgery because of the adjacent anatomical structures. Awareness of this case presentation can prevent a delay in diagnosis.

In this case, retroperitoneal malignant carcinoma mimicked a psoas abscess and presented the same symptoms. According to the literature interview, primary neoplasms causing metastases to the psoas include carcinoma of the cervix,^[3] colorectal cancer,^[5] renal cell carcinoma,^[7] and lung cancer.^[8] There have also been reports of schwannoma and malignant fibrous histiocytoma arising from psoas, and retroperitoneal schwannoma or malignant fibrous histiocytoma initially misdiagnosed as a psoas abscess.^[9–12] Our extensive literature review indicates that retroperitoneal metastatic germ cell tumor can also present with psoas abscess.^[13,14]

It has been reported that the level of serum β -HCG is elevated in different kinds of tumors, including renal cell carcinoma,^[15] cervical squamous carcinoma,^[16] ovarian cancer,^[17] choriocarcinoma,^[18] endometrial carcinoma,^[19] sigmoid carcinoma,^[20] lung cancer,^[21] and so on.

It can be difficult to distinguish psoas diseases whether resulting from inflammation, hematoma, or tumors, especially with no specific symptoms. The clinical presentation of psoas abscess is variable, only 30% of patients complicating with fever, back pain, and limp.^[22] Several diagnostic approaches such as ultrasound, X-ray, CT, MRI, and CT-guided percutaneous drainage have been established. CT scans of psoas abscess include low-density compared with normal muscle and some are hyperdense and ring-enhancing.^[23] CT almost provides a definite diagnosis and is regarded as gold standard. MRI is considered more sensitive than CT scan. But the CT scan and MRI of a case report revealed no abnormalities, suggesting that very early psoas abscess might be undetectable by those methods.^[24] CT-guided percutaneous drainage is considered as a safe and effective

diagnostic approach, and surgical drainage should be used for failure of percutaneous drainage or in the existence of contraindications of percutaneous drainage.^[25]

Analyzing the course of the case retrospectively, the poorly differentiated carcinoma with secretion of β -HCG metastasizes to psoas and has the symptoms like a psoas abscess. The diagnosis of the case is influenced by some misleading results such as the CT and MRI of the lesion as being tuberculosis with psoas abscess. This case confirmed and reiterated the complexity of psoas abscess regarding diagnosis and therapy. The pathological examination, PET-CT, and sigmoidoscopy helped to make definitive diagnosis. In order to be successful in the diagnosis and treatment of malignant abscesses, an adequate tissue specimen is very important. Therefore, correct and early diagnosis is essential.

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