



Perirenal fat metastasis of prostate cancer

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ABSTRACT

A 72-year-old male underwent an abdominal CT scan, which revealed a 17-mm nodular incidentaloma in fat tissue in the left perirenal space. Retroperitoneoscopic surgery was performed to remove the tumor and histopathological results revealed a PSA-positive adenocarcinoma, which was diagnosed as a metastatic lesion associated with prostate cancer. PSA was high at 30.083 ng/ml and MRI findings showed extracapsular extension of prostate cancer in the left peripheral zone of the prostate gland. Biopsy results with a Gleason score of 4 + 4 confirmed the diagnosis of prostate cancer. The case was diagnosed as prostate cancer metastasis in perirenal fat tissue.

Introduction

It is unusual for mass lesions to occur in retroperitoneal space and those can be related to rarely encountered diseases, such as myelolipoma, liposarcoma, leiomyosarcoma, and metastatic tumors.¹ Differentiation is often difficult with imaging findings alone, thus histological diagnosis based on fine needle biopsy, or open or laparoscopic surgery results is often required. Prostate cancer metastasis is most often found in bone, followed by lymph node, liver, and lung tissues.² However, to the best of our knowledge, there have been no reports of prostate cancer metastasis to perirenal fat tissue and present the first known case here.

Case presentation

A 72-year-old male underwent coronary CT scanning for cardiac disease, which revealed a 5-mm diameter nodule in fatty tissue in the left perineal space and two nodules, each 5 mm in diameter, in the lower lobe of the right lung. Thereafter, he visited our hospital for a thorough examination of the nodule in the left perirenal space. An abdominal CT scan was performed six months later, which showed that the perirenal fatty tissue nodule had enlarged to 17 mm, suggesting malignant disease. Additionally, contrast-enhanced CT revealed slight contrast from the early to late phase (Fig. 1). An MRI examination was also performed, though did not show typical findings indicative of a specific disease.

For accurate diagnosis, a retroperitoneoscopic tumor resection was performed. Fat from the left perirenal space was removed, in which a

hard tumor with a slightly grey circumferential surface and diameter of approximately 2 cm was found (Fig. 2a). Histopathology revealed a moderately differentiated adenocarcinoma composed of gland ducts that was positive for PSA in immunohistochemical results, leading to a diagnosis of prostate cancer (Fig. 2b and c). PSA was high at 30.083 ng/ml, MRI showed suspected extracapsular invasion of prostate cancer in the left peripheral zone, and prostate biopsy results revealed prostate cancer with a Gleason score of 4 + 4. The patient had no history of PSA test or digital rectal examination findings.

A chest CT examination was also performed, which showed enlarged nodules in the lower lobe of the right lung (Fig. 3) and a new nodular shadow in the left lung, thought to be lung metastasis. There were no significant bone scintigraphy findings. Combined androgen blockade therapy was started and the PSA level gradually decreased. After approximately six months, PSA was reduced to 0.061 ng/ml and there was no imaging evidence of a metastatic lung tumor.

Discussion

Imaging findings in the present case led to a differential diagnosis of leiomyosarcoma, liposarcoma, RCC metastasis, or malignant lymphoma. Image-guided fine needle aspiration cytology (FNAC) and biopsy procedures are advantageous due to minimal complications, cost-effectiveness, and lower levels of invasiveness as compared to surgical methods. Das et al. reported an overall diagnostic accuracy rate for image-guided FNAC of 94.12%, though 28 inadequate specimens

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Fig. 1. Contrast-enhanced CT showed a 17-mm diameter nodule in fatty tissue in the left perineal space (arrowhead).

encountered in 338 cases and 37 cases needed repeat aspirations.² Perirenal fat mass in our patient was low (17 mm), thus it was considered that an adequate sample might not be fully obtained with a fine needle biopsy procedure and the patient requested a more reliable method of diagnosis. As a result, retroperitoneoscopic tumor resection was chosen, which led to the final diagnosis of prostate cancer.

Gandaglia et al. analyzed metastatic sites in 74,826 patients with metastatic prostate cancer and found that bone metastasis was the most common (84.4%), followed by distant lymph node, liver, and lung and pleural metastasis (~10% for each).³ The prevalence of retroperitoneal metastasis was rare at 1.8%, but those did not include any cases of metastasis in perirenal fat. Other reports of metastasis to perirenal fat also noted a very low frequency, with malignant melanoma and gastrointestinal cancer cases the most common.⁴ However, no known reports of prostate cancer metastasis to perirenal fat tissue have been presented, making the clinical findings in the present case extremely rare.

Bubendorf et al. analyzed autopsy results of 1589 prostate cancer patients and reported three pathways of metastasis, (1) from the paravertebral or Batson's plexus to lower spine, (2) dissemination to other organs via metastasis from the vena cava to a lung, and (3) from the vena cava to internal organs without lung involvement.⁵ Most cases of bone metastasis from prostate cancer occur via a pathway from the paravertebral plexus or Batson's plexus to lower spine. A metastatic pathway to perirenal fatty tissue could be both hematogenous and lymphogenous, since blood and lymphatic vessels of the renal capsule penetrate that tissue. As for the present case, we speculated that the pathway of metastasis in our patient was likely hematogenous via the vena cava, because of the absence of lymph node or bone metastasis, and presence of lung metastasis.

Conclusion

Metastatic disease from prostate cancer should be considered in male patients with a tumor mass in perirenal fat.

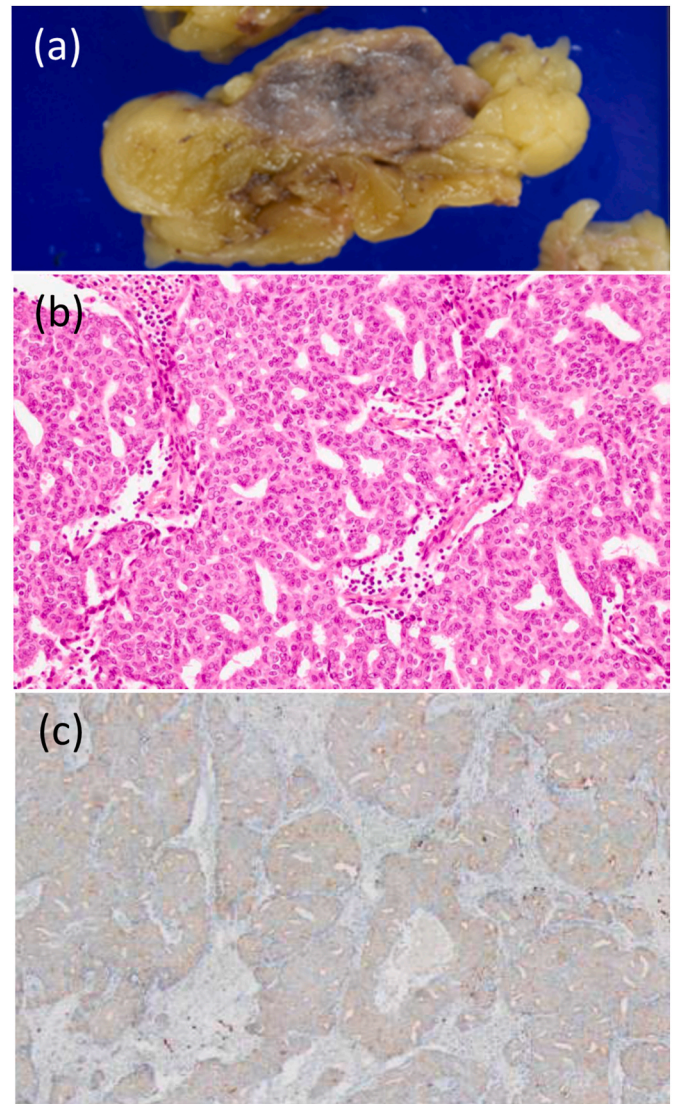


Fig. 2. a. a hard tumor with a slightly grey circumferential surface and diameter of approximately 2 cm was found in the left peritoneal fatty tissue, b. a moderately differentiated adenocarcinoma composed of gland ducts was revealed in Hematoxylin and Eosin staining, c. PSA was positive in immunohistochemical staining.

Author statement

Teppey Wakita: Investigation, Data curation, Visualization, Writing-Original draft preparation.

Kazuaki Yamanaka: Conceptualization, Project administration, Writing- Reviewing and Editing.

Akihiro Yoshimura: Writing- Reviewing and Editing.

Shota Fukae: Writing- Reviewing and Editing.

Takahiro Yoshida: Writing- Reviewing and Editing.

Hidefumi Kishikawa: Writing- Reviewing and Editing.

Consent for publication

Informed consent was obtained from the patient for publication of the case details.

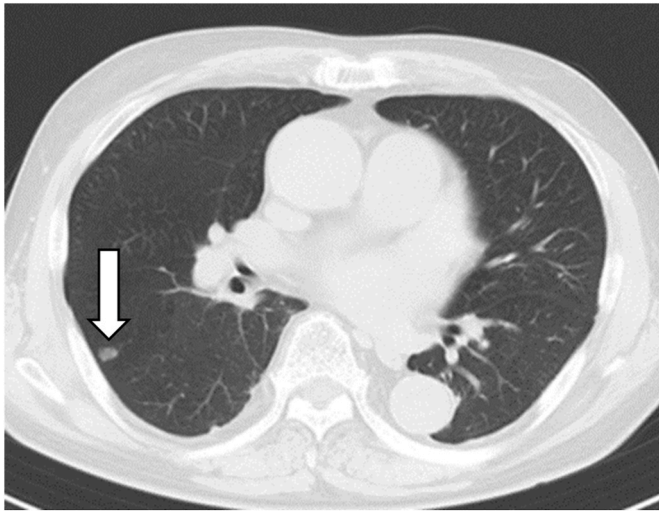


Fig. 3. A chest CT examination showed lung metastasis in the lower lobe of the right lung (arrow).

Declaration of competing interest

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