Pancreatic Metastasis from Prostate Cancer: A Case Report

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Case report

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Abstract

Background: The most common site of prostate cancer metastasesis the bone, followed by the lung, bladder, liver, and adrenal gland. Metastasis from other primary tumours to the pancreas is relatively rare. Here, we report a case of pancreatic metastasis from the prostate.

Case presentation:A 52-year-old man was admitted to the hospital with pain in his upper abdomen that had persisted for 20 days. Positron emission tomography/computed tomography examination revealed malignant lesions in the head and tail of the pancreas and a possibility of prostate cancer. Biopsy of the prostate and pancreas were performed,the resultsof which indicated pancreatic metastasis of prostate cancer. After undergoing androgen deprivation therapy and docetaxel chemotherapy for 6 cycles, re-examination revealed that the pancreatic metastases had disappeared.

Conclusion: Pancreatic metastatic cancer usually has a poor prognosis, while prostate cancer generally has better outcomes.In this case, the pancreatic metastases disappeared completely following endocrine therapy and chemotherapy. We hope this case will provide a reference for the treatment of similar cases in the future.

Background:

In general, the most common primary tumour of pancreatic metastasis is renal cell carcinoma, followed by colorectal cancer, melanoma, breast cancer, lung cancer, and sarcoma [1]. However, as reported by Adsay et al., the most common primary source of pancreatic metastasis was lung cancer, followed by gastrointestinal tumours and lymphomas [2]. Metastasis from other primary tumours to the pancreas is relatively rare. Here, we report the case of an adult male diagnosed with prostate cancer that had metastasized to multiple sites within the bone and pancreas. We present the following case in accordance with the CARE reporting checklist [3].

Case Presentation:

The patient, a 52-year-old man, came to the Department of Hepatobiliary Surgery because of epigastric pain that had persisted for 20 days. Upon physical examination, the patient had mild tenderness in the upper abdomen with no other clinical abnormalities. His serum tumour marker levels were assessed: prostate specific antigen (PSA), 12.62 ng/ml; neuron specific enolase, 22.02 ng/ml. Epigastric magnetic resonance imaging (MRI) highlighted a possibility of malignant lesions in the pancreatic head and tail; multiple swollen lymph nodes observed in the retroperitoneum were likely metastases. Positron emission tomography/computed tomography (PET-CT) examination showed the following: metabolism was active at the head and tail of the pancreas with increases in local avidity, suggesting a high possibility of malignant; prostate malignancy; and multiple lymph node and bone metastases (Fig. 1). As these results suggested metastatic prostate cancer, the patient was transferred to the Department of Urinary Surgery. The patient underwent a digital rectal examination with the following results: prostate □ ° swelling, normal

contour, tenacity, tenderness (+), shallow central sulcus, and no blood stain on the finger. Single-photon emission tomography/computed tomography indicated that bone metastasis was possible. Pelvic MRI showed abnormal signals in the peripheral zone of the prostate alongside invasion of the seminal vesicle glands and the posterior wall of the bladder, consistent with a diagnosis of prostate cancer; further, multiple lymph node and bone metastases were found. After perfecting the bowel preparations, a transrectal ultrasound-guided prostate biopsy was performed. Histopathology indicated prostate adenocarcinoma with a Gleason score of 5 + 4. Immunohistochemistry results were as follows: B / E / F / L: P63 myoepithelial (+); I: 34BE12 (−); P504S weak (+); D / G / M: P504S Weak (+), CK (+), and PSA (−) (Fig. 2). In order to clarify the nature of the pancreatic lesions, an endoscopic ultrasound-guided fine-needle aspiration was performed. This investigation revealed a pancreatic tail with hypoechoic lesions, which were approximately 24 × 14 mm in size. The echo was still uniform, had a boundary that was slightly blurred, and little blood flow signal inside. Multiple lymph nodes were seen in the head of the pancreas and beside the bile duct, the largest around 9 mm. Immunohistochemistry showed atypical cells. cytokeratin (CK) (AE1 / AE3), CK19, PSAP and Smad4 were found to be positive, whilst KI67 was approximately 20% positive. Pathological results showed a small amount of pancreatic tissue and a small amount of heterotypic epithelial cell nests in the background of a massive haemorrhage. These results, combined with the immunohistochemistry results, were consistent with an adenocarcinoma. This supported the diagnosis of a pancreatic metastasis from a prostate adenocarcinoma (Fig. 3; the patient was subsequently diagnosed with multiple metastatic prostate cancer (cT4N1M1c). The patient was otherwise in good physical condition and was treated for metastatic hormone-sensitive prostate cancer (mHSPC) with a high tumour burden using systemic chemotherapy and androgen deprivation therapy (ADT). The patient underwent systemic chemotherapy with docetaxel and prednisone for six cycles, while receiving androgen deprivation therapy with Goserelin and Bicalutamide. His PSA was reviewed after the sixth cycle of chemotherapy and was found to have to 0.01 ng/ml. Patient re-examination using enhanced computed tomography (CT) showed that the pancreatic metastases had disappeared (Fig. 4). This response also suggested that the patient suffered from metastatic prostate cancer.

Discussion:

The most common metastatic site for prostate cancer is the bone, followed by the lung, bladder, liver, and adrenal gland; the pancreas is a very rare site of metastases. An autopsy study of 1,589 men with prostate cancer by Bubendorf et al. showed that 35% (556) of patients had haematogenous metastases, and pancreatic metastases accounted for only 1.4% of patients with hematologic metastases [4]. Clinically, pancreatic metastatic malignant tumours are also very unusual, accounting for only around 2 to 5% of all pancreatic malignancies [5]. Patients with pancreatic metastasis from prostate cancer are even rarer; to our knowledge less than 10 cases have been previously reported.

The head of the pancreas (41.8%) is the most common site of pancreatic metastases, followed by the body and tail of the pancreas (34.9%) and the ampulla area (8.9%) [6]. More than half of patients with pancreatic metastases are usually asymptomatic, and most metastases are found during a follow-up treatment of the primary tumour [7]. Patients that are symptomatic often have nonspecific complaints,

such as abdominal pain, anaemia, weight loss, vomiting, jaundice, or bleeding in the digestive tract. In the case reported here, the tumour was located in the head and tail of the pancreas, and the patient came to the hospital with abdominal pain as the first symptom. Imaging is helpful for the diagnosis of pancreatic metastases, but histological examination is still necessary to confirm the diagnosis. As the treatment and prognosis of pancreatic metastatic tumours arising from prostate cancer are different from those of primary pancreatic cancer, a biopsy of the pancreatic mass is particularly important when the patient has, or has had, prostate cancer.

Common pathways for pancreatic metastatic tumours include direct spread from adjacent organs, haematogenous metastasis, lymphatic metastasis, and seed dissemination. In this patient, multiple systemic metastases – including metastases to the pancreas – were present. However, considering that the PET-CT suggested multiple lymph node metastases in the abdominal cavity, between the liver and stomach around the pancreas and retroperitoneum, we cannot rule out the possibility that the lymph nodes around the pancreas directly invaded the pancreas parenchyma, leading to metastasis.

It remains controversial as to whether surgery is the preferred treatment for pancreatic metastatic cancer. However, for patients with a single pancreatic metastasis, resection of the metastasis is often an important condition for long-term survival of the patient [6]. At present, ADT therapy combined with docetaxel chemotherapy has been recommended by the National Comprehensive Cancer Network guidelines and the European Association of Urology guidelines as the first-line treatment for untreated metastatic prostate cancer that can tolerate chemotherapy [8]. This patient had multiple bone metastases and pancreatic metastases, which are in line with mHSPC with a high tumour burden [9]. Previous studies have shown that ADT combined with docetaxel chemotherapy can improve the overall survival of patients compared to ADT alone, and the survival benefit is more obvious in patients with a high tumour burden, so docetaxel chemotherapy was added to the ADT regimen in this patient [10, 11].

Pancreatic metastatic cancer usually has a poor prognosis, while prostate cancer generally has better outcomes. As this patient had only been treated for a short time, further observation and follow-up are still needed. Few reports of pancreatic metastasis of prostate cancer currently exist in the literature, and the long-term efficacy of this therapeutic regimen is unknown. Therefore, further research on effective treatment of this disease is needed.

Abbreviations

PSA: prostate specific antigen. MRI: magnetic resonance imaging. PET-CT: Positron emission tomography/computed tomography. CK: cytokeratin. mHSPC: metastatic hormone-sensitive prostate cancer. ADT: androgen deprivation therapy. CT: computed tomography

Declarations

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Not applicable.

Authors' contributions

Zhengyu Zhou and Yimu Zhang collected the patient's clinical data, and drafted the manuscript. Jiyan Bai helped in the management of the patient. Zhengyu Zhou, Pengcheng Zhao, and Dong Yang collected the patient's clinical data. Yazhen Hong and Chaohong He made revision and supervision of the study. All authors read and approved the final manuscript. Zhengyu Zhou and Yimu Zhang contributed equally to this work.

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Availability of data and materials

All data obtained is available within the manuscript.

Ethics approval and consent to participate

The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. Written informed consent was obtained from the patient for publication of this manuscript and any accompanying images.

Consent for publication

Written informed consent was obtained from the patient for publication of this manuscript and any accompanying images.

Competing interests

The authors declare that they have no competing interests.

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Figures

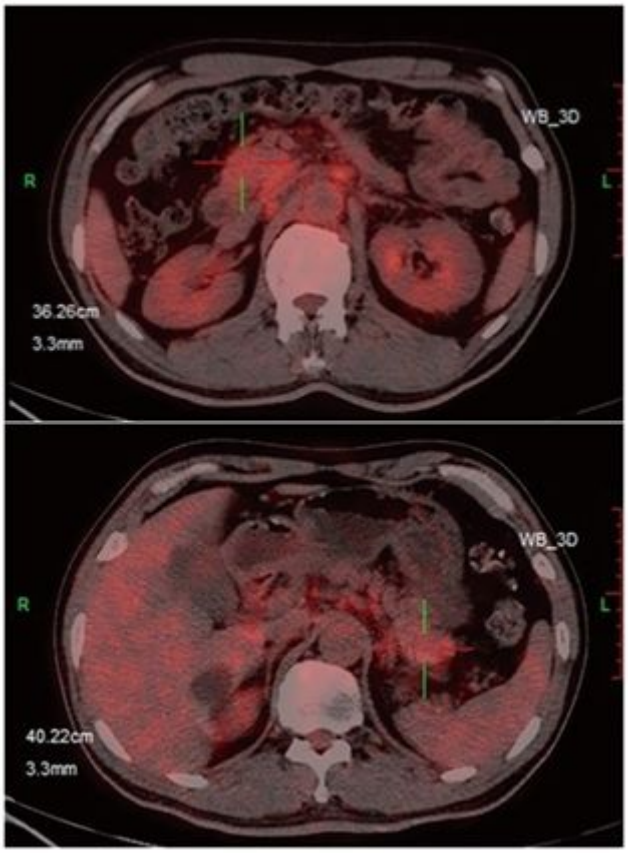

Figure 1

Positron emission tomography/computed tomography (PET-CT) indicated metabolic activity at the head and tail of the pancreas.

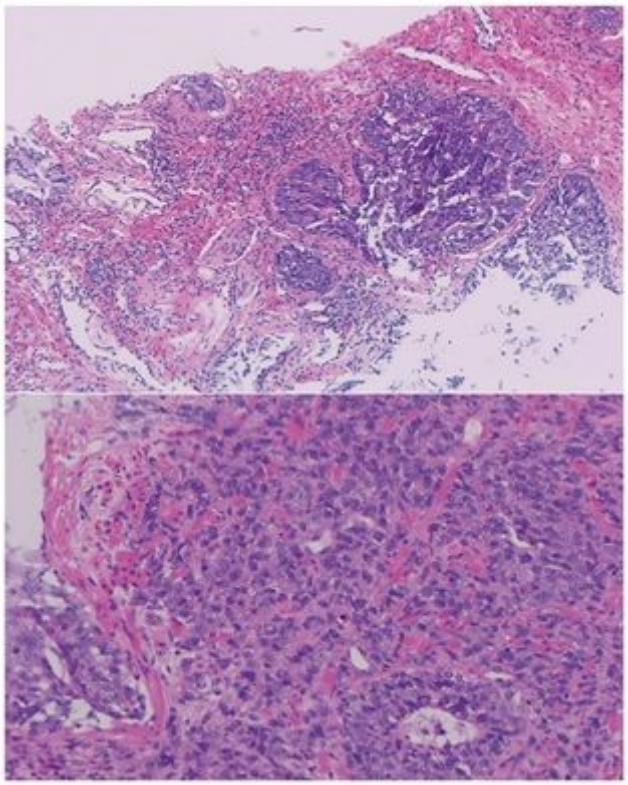

Figure 2

Pathological findings from the prostate biopsy (×20).

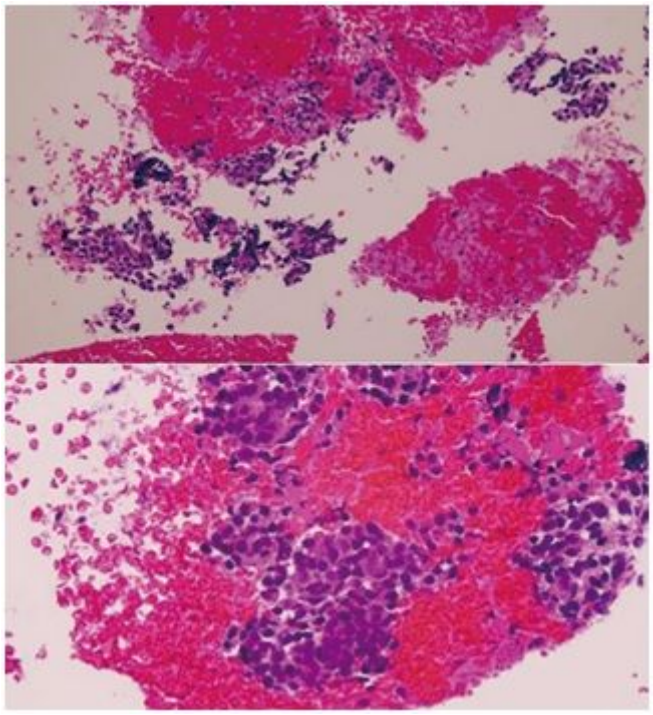

Figure 3

Pathological findings from the endoscopic ultrasound-guided fine-needle aspiration (×20).

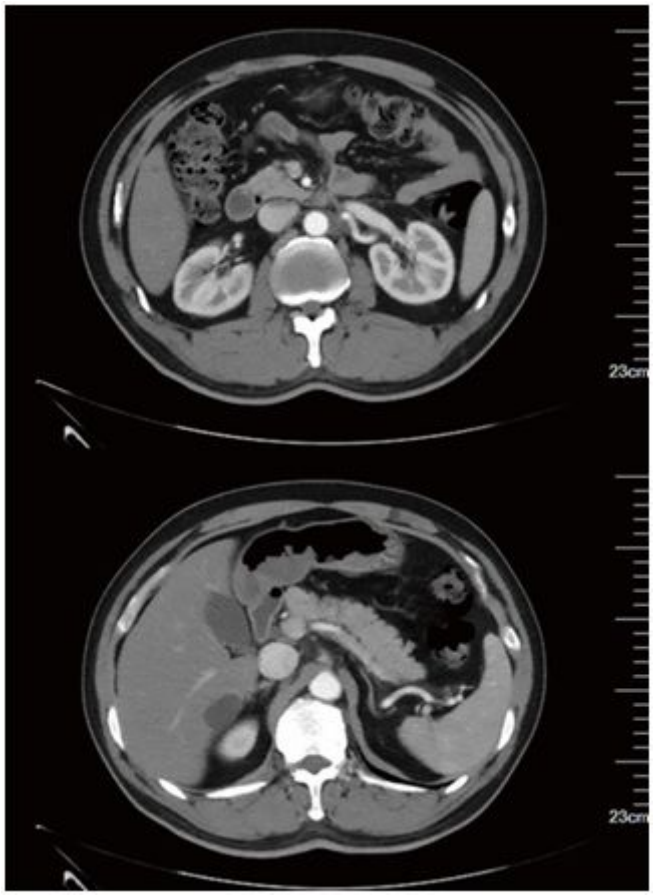

Figure 4

Enhanced computed tomography showed that the pancreatic metastases had disappeared.