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Primary solitary fibrous tumor of kidney: A case report and literature review

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ABSTRACT

Primary solitary fibrous tumors of kidney are rare in clinical practice. In literature, only eleven reported cases originated from renal pelvis. We report a case of a 45 year old middle-aged woman who was the first report that a small number of heterosexual cells have been found in urine. Definite diagnosis of this disease still depends on pathological examination, If preoperative puncture or other pathological examination supports the diagnosis of SFTs, the preferred treatment plan for it is surgical resection.

Introduction

According to previous research data, most solitary fibrous tumors (SFTs) originated in mesothelial tissue. SFT was first found in pleural cavity. With the development of imaging and pathology, some cases of SFT were found in urinary system and reproductive system. However, cases of SFT were particularly rare. There were 25 cases of SFT in China, and 97cases in other countries according to literature review. 11 cases were located in the renal pelvis. Due to the lack of cases, diagnosis and treatment for patients with SFT were analyzed through case report independently. SFT in the renal pelvis was easily diagnosed to be epithelioma of renal pelvis or urinary tract mistakenly, which might affect scope of surgical resection, increase the cost of patients and the risk of operation.

Case report

A 45-year-old female patient was admitted to hospital because of space-occupying lesions of the left kidney for 2 days. She had no complaints of low back pain, abdominal pain, frequent micturition, urgent micturition, hematuria or any other discomforts. Before admission, urological ultrasound suggested that the patient had solid masses in the left kidney. For further diagnosis, the patient was received by Department of Urology of the Affiliated Hospital of North Sichuan Medical College.

Before admission, urological ultrasound suggested a regular-shaped echoic mass (4.7*2.7cm) in the left renal hilus and the connection part of kidney and ureter. Blood flow signals were detected in the echoic mass, and boundaries of mass and surrounding tissues were clear (Fig. 1). Abdominal CT showed a soft tissue nodule of the left renal pelvis (about 3.8*2.4cm). Contrast-enhanced CT showed that heterogeneous enhancement of the focus was strong in cortical phase obviously, while there were increase and decrease of enhancement in different parts of the focus (Fig. 1). During corticomedullary phase, enhancement of the focus was reduced. According to renal ECT, abnormal imaging agent was found in defect area of the left renal pelvis (the left kidney GFR43.86ml/min, and the right kidney GFR47.45ml/min).

Three times of examination of urine's exfoliative cytology were performed to the patient before operation, but a very small number of atypical lymphocytes were found only once. During operation, a mass (4.0*2.5*2.0cm) was found in the left renal pelvis by specimen examination. After dissection of specimens, the solid surfaces of tumor were grayish-white, fishlike/fusiform, hard, and tumor cells were separated from surrounding renal tissues (Fig. 2). According to postoperative microscopic examination of paraffin sections, tumor cells were fusiform and irregular, boundaries of tumor cells were clear, cytoplasms were lightly stained, nuclei were orbicular-ovate, and mitotic counts were rare. Relevant immunohistochemistry results were as follows: S-100 (−), MelanA (−), HMB45 (−), SMA (−), STAT6 (+), CD34 (+), CD99 (+) and Ki67 (+, 5%) (Fig. 3).

Discussion

SFTs mainly derives from fibroblasts and primitive mesenchymal cells.[1] Extrapleural SFTs are mainly found in orbit, thyroid, liver, pancreas, retroperitoneal space, skin and so on. SFTs that originated from kidneys are particularly rare.[2] According to ultrasound detection,

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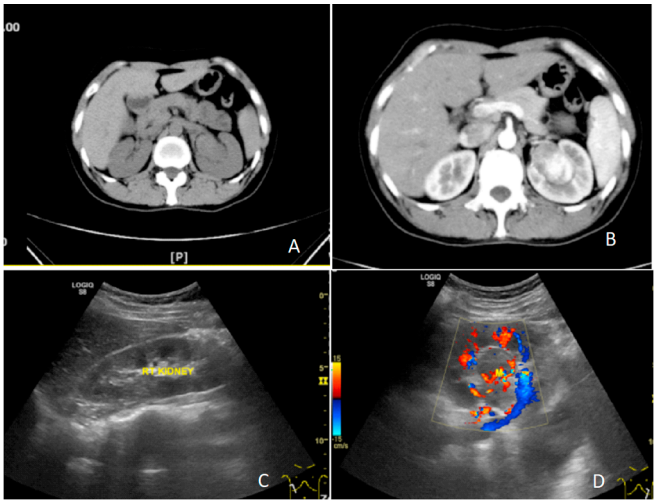

Fig. 1. Preoperative transabdominal ultrasound and Doppler examination, preoperative CT and contrast-enhanced CT, and renal ECT examination. A:Renal CT, B:Renal contrast-enhanced CT, C:Abdominal ultrasound, and D:abdominal Doppler ultrasound.

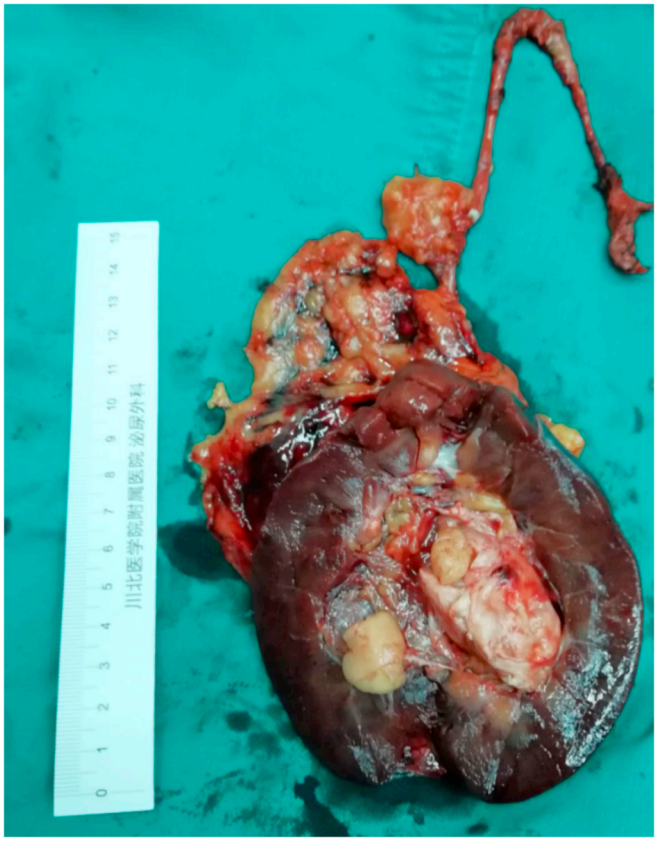

Fig. 2. Anatomy of tumor during operation.

solitary fibrous tumor had clear boundaries with surrounding tissues, the echo pattern of tumor was hypoechoic, and blood flow signals could be found in tumor. Part of tumor might be more visible after using contrast-enhanced CT. MRI showed signals of low to moderate intensities in both T1 and T2, which was mainly caused by different level of collagen fibers in tissues.

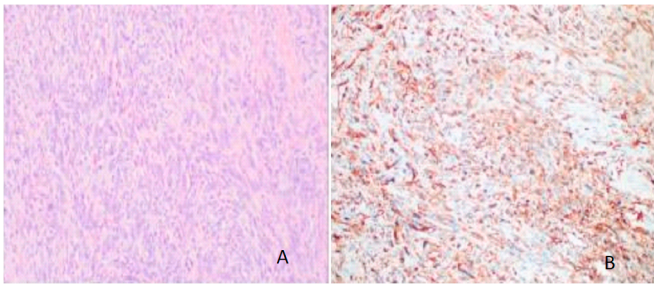

Fig. 3. Postoperative pathological examination and immunohistochemical staining. A: HE staining of tumor specimen, and B:immunohistochemical staining of CD34.

Specimens of benign SFTs showed that tumor was hard and grayish-white, and it had clear boundaries with other tissues. Under microscope, forms of tumor cells usually were fusiform, bunchy or otherwise irregular, and interstitial vessels were abundant, with some were hemangioma-like or hemangiopericytoma-like structures. The diagnostic criteria for malignant SFT were proposed by England in 1989: (1) mitotic count > 4/10HPF; (2) diversity of shapes of cells; (3) many focal points in cells; and (4) necrosis of some cells.[3] In the latest classification of SFTs formulated by WHO, the above criteria were still used for the diagnosis of extrapleural malignant SFTs.The high rates of positive expressions of CD34, CD99 and bcl-2 could accurately distinguish SFT from other tumors of fusiform cells. In SFTs, the positive expression rate of CD34 was about 90%–95%; CD99, about 70%; bcl-2, 20%–35%; epithelial membrane antigen, 20%–35%, and S100 and others had low rates of positive expression.[4] However, some data showed that with the further deterioration and metastasis of SFT, the positive expression rate of CD34 decreased, and the specific mechanism was still unclear.[5]

We summarized clinical and pathological features of 11 cases of solitary fibrous tumors in renal pelvis. These cases have not been systematically reported before. The majority of tumors are benign and prognosis is better. the most effective tool is CD34 positivity to distinguish it from other spindle cell tumors. According to the data of previous cases, complete resection of lesions is still a preferred choice. Imaging examination of SFT is not specific.

SFT in the renal pelvis was easily diagnosed to be epithelioma of renal pelvis or urinary tract mistakenly, which might affect scope of surgical resection. This is the first report that a small number of heterosexual cells have been found in urine. The scope of surgical resection includes the kidney and the entire ureter and part of the bladder. But postoperative pathological examination tends to be benign. For patients with refractory hypoglycemia and hypothyroidism, it is suspected that there may be a SFT. If necessary, Many times of examination of urine's exfoliative cytology and preoperative pathological examination can be performed to confirm the diagnosis. Immunohistochemical staining is recommended for pathological specimen. The evaluation of benign and malignant SFT mainly comes from case reports. We hope to establish a system for grading the risk of SFT, and individualized treatment for highly malignant potential patients.

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