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Laparoscopic removal of retroperitoneal schwannoma in renal hilum: a case report

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Abstract

Background Schwannomas in the renal hilum are rare among retroperitoneal tumors. However, the possibility of malignant findings cannot be ruled out, and surgery is often indicated. This case was expected to be difficult to remove laparoscopically because the tumor was sandwiched between the arteriovenous veins of the renal portal. Sometimes, the tumor should be resected with a conservative approach to the kidney to preserve the renal function.

Case presentation Our patient was a 51-year-old Asian-Japanese man who was referred to our department for a retroperitoneal tumor in the renal hilum. Since malignancy could not be ruled out due to its size (45×48×55 mm) on imaging, the tumor was excised laparoscopically. Histopathology revealed schwannoma.

Conclusions We herein report a case in which a renal hilar tumor between renal arteriovenous vessels was successfully resected laparoscopically.

Keywords Schwannoma, Retroperitoneal tumor, Renal helium, Laparoscopic, Case report

Introduction

Retroperitoneal primary schwannomas are estimated to be 0.7%, and moreover, schwannomas in renal hilum are rare [1, 2]. Diagnosis of schwannomas in the renal hilum is difficult preoperatively due to nontypical clinical symptoms, and most are found incidentally on imaging studies. Differential diagnoses of tumors arising in the renal hilus include liposarcoma, leiomyosarcoma, renal angiomyolipoma, malignant lymphoma, neurogenic tumor, tumor of the pancreatic tail, and hemangioma, among others [3, 4]. In some cases, surgical resection is performed because it is difficult to differentiate these tumors from renal cell carcinoma on imaging. In this report, we describe a case in which a tumor in the renal hilum, which was located between the renal arteriovenous veins and was of approximately 5 cm diameter, was successfully resected laparoscopically.

Case presentation

The patient was a Asian-Japanese 51-year-old male. He had no particular family, past medical, dental, social, or employment history or complications. He had not undergone any prior intervention and was not on any medications, and did not smoke or drink habitually. He had no remarkable physical or neurological findings at the time of admission. He was suspected of having a tumor on the dorsal pancreas during an echo examination at his routine medical checkup, and visited his previous doctor in April 2021, who performed contrast-enhanced computed tomography (CT) and magnetic resonance imaging (MRI). Suspecting a retroperitoneal tumor, he was referred to our department in June 2021. There were no physical findings, family history, or surgical

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history. Contrast-enhanced CT showed a well-defined 45×48×53 mm mass between the aorta and left adrenal gland, flanked by renal arteriovenous veins, with soft marginal density, low central absorption, and pale staining at the margins, with poor contrast effect at the center; a neurogenic tumor or chronic expanding hematoma was suspected (Fig. 1).

Contrast-enhanced MRI showed cystic degeneration or necrosis in the center, slightly low signal on T1 weighted image, slightly high signal on T2WI, and high signal on diffusion-weighted images in the margins (Fig. 2). We suspected a full stromal mass and considered neurogenic tumor, leiomyoma, extragastrointestinal Gastrointestinal Stromal Tumor, and leiomyosarcoma. Positron emission tomography (PET)–CT, 123I-metaiodobenzylguanidine, and blood tests were performed at our hospital; PET–CT showed a Standard Uptake Value max of 5.5 with no other obvious abnormal accumulation (Fig. 3a); MIBG showed no accumulation of left retroperitoneal tumor and was negative for pheochromocytoma (Fig. 3b). Laboratory examination revealed normal complete blood count and normal liver, renal, metabolic, and endocrine testing including no significant elevation of the catecholamine system. In any case, since the size of the tumor was about 5 cm and malignancy could not be ruled out, the decision was made to perform surgical resection.

The tumor was located between the arteriovenous veins of the renal portal. Due to the low invasiveness of the procedure, the policy was to start with laparoscopic surgery and change to open surgery if necessary. Surgery was reached via a transperitoneal approach, the bowel was dehiscent, and the tumor was found dorsal to the renal vein (operative image in Fig. 4). The tumor was dissected down the side of the tumor, and the area of dissection was exposed by packing the dissected area with gauze. The renal vein was taped, the space between the renal vein and the tumor was dissected, and the vessels extending partially into the tumor were clipped before dissection. The renal artery on the dorsal aspect of the renal vein was identified and dissected away from the tumor. Part of the dorsal portion of the tumor was firmly attached to the iliopsoas muscle and was removed through a partially sharp incision. The operation time was 211 minutes, and no blood transfusion was performed.

The specimen was a yellowish-white, loose, substantial lesion with hemorrhage (Fig. 5). Pathology revealed proliferating acidophilic cells with spindle-shaped nuclei, with sparse cell density and fenestrated arrangement (Fig. 6). The lesion was covered with a thick fibrous connective fabric, with stretched ganglia at the margins. The final pathological diagnosis was schwannoma. One year after surgery, he showed no evidence of recurrence. He was examined by CT every 6 months for the first 2 years postoperatively and annually thereafter, with no signs of recurrence.

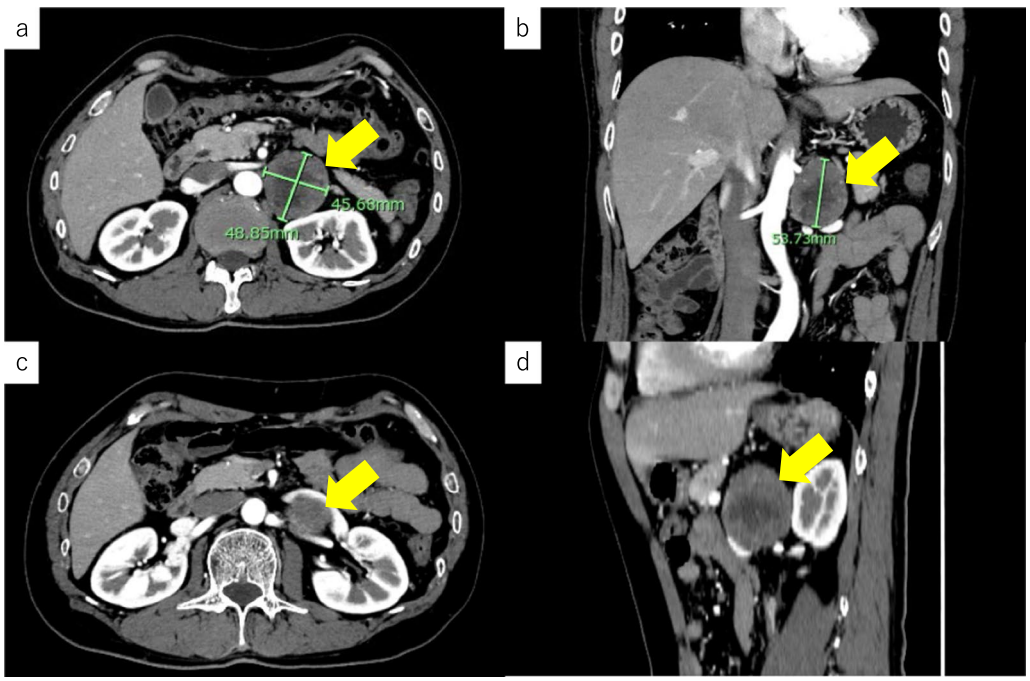

Fig. 1 Preoperative contrast-enhanced **a** axial, **b** coronal, **c** coronal, and **d** sagittal computed tomography (CT). **c** The tumor was surrounded by renal arteriovenous veins (yellow arrows: tumor)

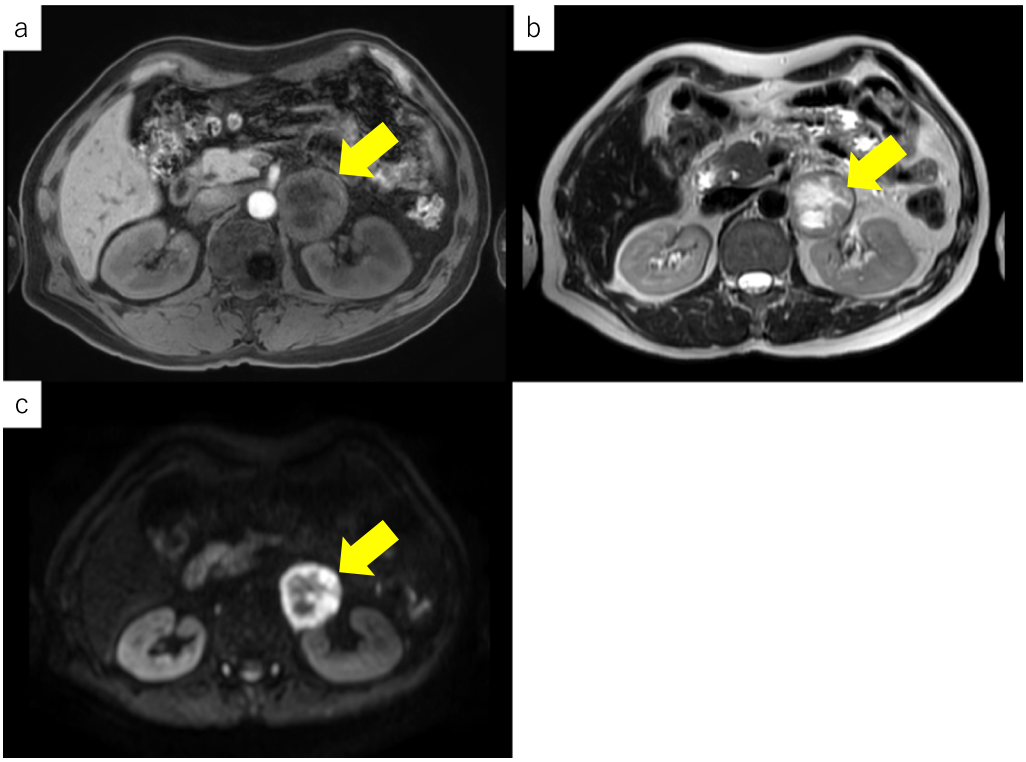

Fig. 2 Magnetic resonance imaging (MRI) **a** T1-weighted, **b** T2-weighted, and **c** diffusion-weighted images (yellow arrows: tumor)

Discussion

We experienced a case in which the tumor was removed laparoscopically while preserving the kidney in a tumor that was sandwiched between the arteriovenous veins in the renal portal area. The tumor was a schwannoma, and although there was a firm adhesion to the muscle, it could be removed without any problem by dissecting it from the surrounding area.

Most schwannomas occur in the head and neck (44.9%) and extremities (32.6%), with 0.7% being of the retroperitoneal primary type, and schwannomas in the renal hilum are rare [1, 2]. Diagnosis of schwannomas in the renal hilum is difficult preoperatively due to nontypical clinical symptoms, and most are found incidentally on imaging studies [5]. Differential diagnoses of tumors arising in the renal hilum include liposarcoma, leiomyosarcoma, renal angiomyolipoma, malignant lymphoma, neurogenic tumor, tumor of the pancreatic tail, and hemangioma, but with the exception of malignant lymphoma, it is difficult to distinguish them from renal cell carcinoma on imaging [3, 4]. It is also difficult to make a preoperative diagnosis of schwannoma on the basis of imaging alone, and although it is generally believed that most schwannomas are benign, 42 of 143 retroperitoneal

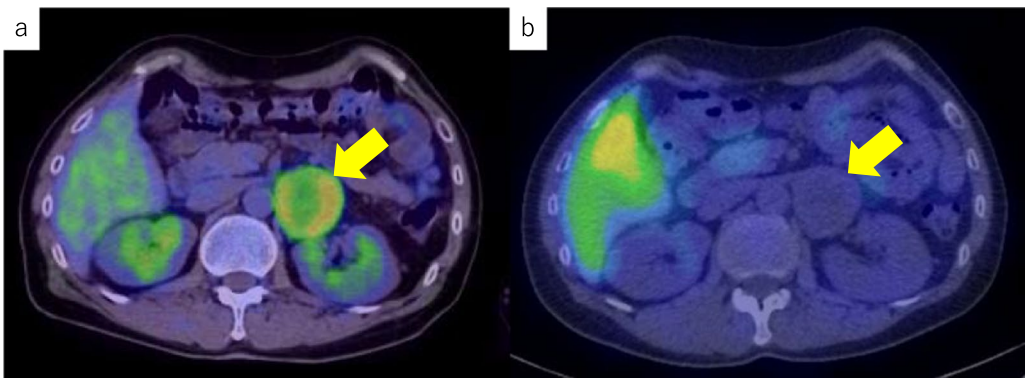

Fig. 3 **a** ^{18}F-fluorodeoxyglucose positron emission tomography and **b** 123I-metaiodobenzylguanidine scintigraphy (yellow arrows: tumor)

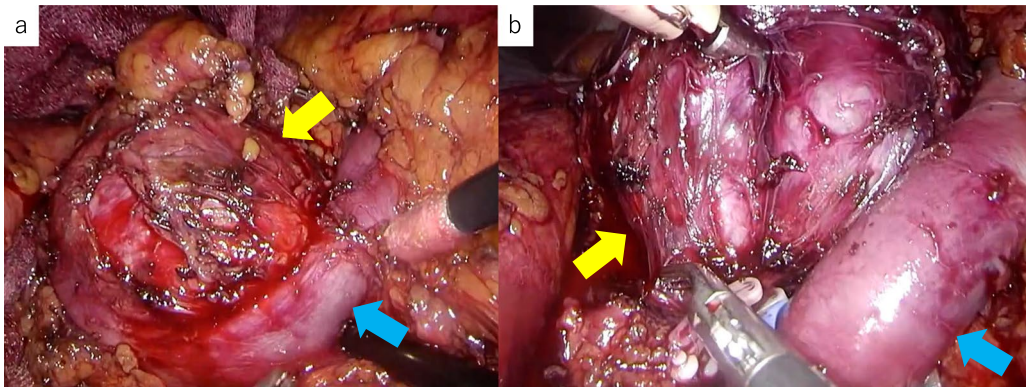

Fig. 4 **a** and **b** Intraoperative image. Tumor (yellow allow) and renal vein (blue arrow)

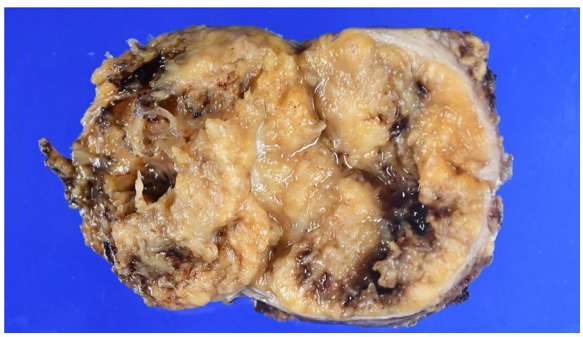

Fig. 5 Resected specimens

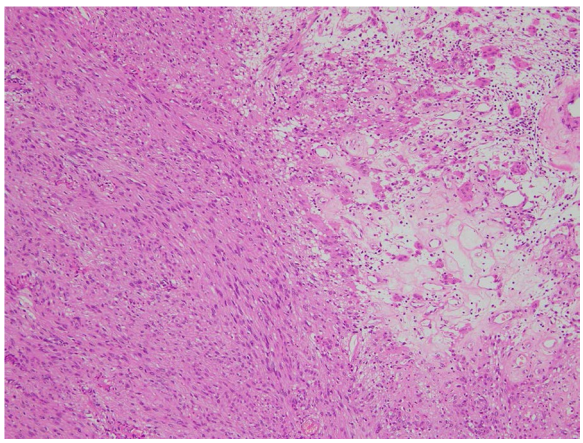

Fig. 6 Antoni type A (left side) and Antoni type B (right side)

schwannomas were reported to be malignant, and surgical resection, including the capsule, is the principle treatment. Recurrence or malignant transformation of benign tumors has also been reported, so postoperative follow-up is also necessary [6].

Schwannomas are histopathologically classified into Antoni type A and Antoni type B. Antoni type A is characterized by a fenestrated arrangement of spindle-shaped cells, while Antoni type B is characterized by a myxoedematous stroma, and most cases have a mixture of both in varying proportions [2, 4, 6, 7]. The present case also shows a mixture of Antoni A and Antoni B types. Acidophilic cells with spindle-shaped nuclei proliferated, the cell density was sparse and arranged on the palisade, and some of them were edematous. Nucleus size anomaly was not conspicuous, and no nuclear fission was observed. The final diagnosis was schwannoma.

The tumor in this case was about 5 cm in size, and due to its low invasiveness, we considered starting with laparoscopic surgery and possibly switching to open surgery. The tumor was located between the arteriovenous vessels of the renal portal area. If the adhesion is strong, it is possible that the kidney and surrounding organs have to be removed in combination. According to Imao *et al.*, retroperitoneal tumors smaller than 6 cm are good candidates for laparoscopic surgery [6]. However, if the adhesion is strong and malignancy cannot be ruled out, the patient should be considered for laparotomy, taking into consideration the possibility of resection of the surrounding organs. If the retroperitoneal tumor is less than 6 cm in diameter, laparoscopic surgery is the first approach, and if the adhesions are strong and malignancy cannot be ruled out, or if the surrounding organs are considered for resection, then conversion to laparotomy may be considered.

Conclusions

We herein report a case in which a renal hilar tumor between renal arteriovenous vessels was successfully resected laparoscopically.

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Author contributions
SY and TK drafted the manuscript. TS, TT, TH, KM, KM, and HU performed the experiment. All authors have approved the final version of the manuscript.

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Data availability
Not applicable.

Declarations

Ethics approval and consent to participate
Not applicable.

Consent for publication
Written informed consent was obtained from the patient for publication of this case report and any accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal.

Competing interests
The authors declare no conflicts of interest in association with the present study.

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