Images — A case of total laparoscopic resection of a giant solitary fibrous tumor of the seminal vesicle: A rare tumor that causes frequent micturition and abdominal pain

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Introduction

Solitary fibrous tumors (SFTs) are a rare type of tumor originating from CD34+ dendritic mesenchymal spindle cells that exhibit fibroblast differentiation. These lesions mainly originate from the visceral pleura and rarely occur outside the pleura, but they can occur in any part of the body. Most lesions are benign, and malignancy is extremely rare. For this type of lesion, the diagnosis relies on pathology, especially immunohistochemical examination.[1]

Extrapleural SFTs are more common in the upper respiratory tract, orbit, and limbs; their occurrence in the seminal vesicle is extremely rare.[2] Since an SFT of the seminal vesicle is located between the bladder and the rectum in the pelvic cavity, compression of these organs can occur as the tumor volume increases and can cause symptoms to manifest, including frequent micturition and dull pain in the lower abdomen.

Case report

A 66-year-old male patient reported frequent micturition accompanied by dull pain in the lower abdomen for one year. Three months prior, his frequent micturition worsened. Rectal examination revealed a space-occupying mass on the anterior wall of the lower rectum with compression of the local lumen. Upon auxiliary examination using B-ultrasound, the right seminal vesicle was not clearly visualized and a mixed echogenic mass measuring 123×81×112 mm was detected in the postero-superior region of the prostate behind the bladder and near the region of the right seminal vesicle. Pelvic cavity computed tomography (CT) showed a large mixed-density lump. It was considered to be a multiple-chamber, cystic, space-occupying lesion originating from the vesicular gland (Fig. 1). Pelvic cavity magnetic resonance imaging (MRI) showed multiple flaky, mixed-grade, slightly low T1 signals and long T2 signals. The rectum and bladder were significantly compressed and displaced (Fig. 2).

Surgery was performed using the laparoscopic approach to remove the tumor. It was visualized between the posterior wall of the bladder and the anterior wall of the rectum and was covered by peritoneum. The bilateral borders were adhered to the internal iliac arteries, and the left internal iliac artery, which exhibited greater tumor involvement, was ligated and excised. The tumor was cystic and solid, with an approximate size of 10×8×10 cm. An envelope on the surface of the tumor was significantly adhered to part of the posterior wall of the bladder and Denonvilliers' fascia. Approximately 400 ml of fluid, which was a dark red color and bloody, was collected from inside the tumor. Compartmentalization and solid tissue were visible in the cyst, and then the tumor was completely removed (Figs. 3, 4).

Results

The gross specimen was a grey- and taupe-colored nodule measuring 11.0×7.0×5.0 cm (Figs. 5, 6). Microscopic examination showed that the tumor cells were flat, with fusiform, round, and oval shapes. Abundant blood vessels, hyalinization of the vascular wall, and interstitial fibrosis were observed. The immunohistochemical results were as follows: Vimentin (+), CD34 (+), Ki-67 (+), CD99 (+), and Bcl-2 (+) (Figs. 7, 8). As of the writing of this report, the patient fully recovered without recurrence.

Discussion

Since Klemperer first reported an SFT originating from the visceral pleura in 1931, this tumor type has been found in many parts of the body. The etiology of SFTs remains unclear. [3] Most recent studies have found that the occurrence and progression of SFTs result from mutual fusion of the NAB2 and STAT6 genes due to internal rearrangement of the 12q13 chromosome, and the most common fusion

Fig. 1. Pelvic cavity computed tomography showed a large lump forming a mixed-density shadow with multiple individual rope-like shadows. The mass showed polycystic changes, and the boundary with the right seminal vesicle was unclear. The adjacent organs appeared compressed. After enhancement, the lesion could be clearly distinguished, and it was considered to be a multiple-chamber cystic space-occupying lesion originating from the vesicular gland.

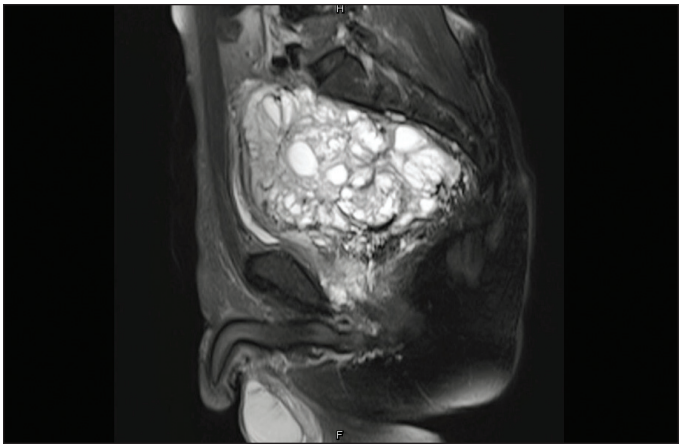

Fig. 2. Pelvic cavity magnetic resonance imaging showed multiple flaky, mixed-grade, long T2 signals. The rectum and bladder were significantly compressed and displaced, and the right seminal vesicle was not clearly visualized.

variants are NAB2ex4 and STAT6ex2/3. Gene fusion can occur at different breakpoints and different types of fusion classify SFTs into different clinical subtypes and determine their corresponding biological behaviour.[4,5]

An SFT derived from the seminal vesicle has not been reported, and a description of the typical clinical features is lacking. According to the information provided by this case, the SFT manifested as a slowly growing local mass of the seminal vesicle.[6,7] When the volume of the tumor increases to a certain extent, the tumor can compress the bladder and reduce its capacity, resulting in the occurrence of frequent micturition. At the same time, the tumor compresses the rectum or even part of the sigmoid colon to cause lower abdominal pain and discomfort, which may be somewhat relieved after urination or defecation.

Imaging examination is the most frequently used method for preliminary diagnosis of SFTs in clinical practice, especially for diagnosing the location of tumors. For seminal vesicle-derived tumors, pelvic cavity CT and MRI have significant advantages for determining the origin and extent of space-occupying lesions and whether they have invaded adjacent tissues. The final diagnosis of seminal vesicle SFT is also dependent on pathological examination. Most international research results show that among the markers that are widely expressed in SFTs, the order of positive rates from high to low is Vimentin, CD34, CD99, Bcl-2, and Ki-67.[8] The latest research indicates that STAT6 has been gradually applied to pathological examination as a highly sensitive immunohistochemical marker because it shows strong expression in the nuclei but not the cytoplasm of most SFTs. According to this feature, STAT6 may be more helpful for distinguishing other types of tumors to confirm the diagnosis.[9]

Clinically, complete surgical tumor resection is the most effective treatment. Because the biological behavior of SFTs cannot be fully evaluated yet, all SFTs should be regarded as tumors with malignant potential. In theory, complete resection should be performed. With the development of laparoscopic techniques, minimally invasive methods have also become possible. The key steps of the operation are as follows:

1. Separate and expose the iliac blood vessels, identify the major arteries that provide blood supply to the tumor to establish early control to reduce the tumor blood supply such that the texture of the tumor becomes soft, thus facilitating the surgical procedure and reducing intraoperative bleeding.

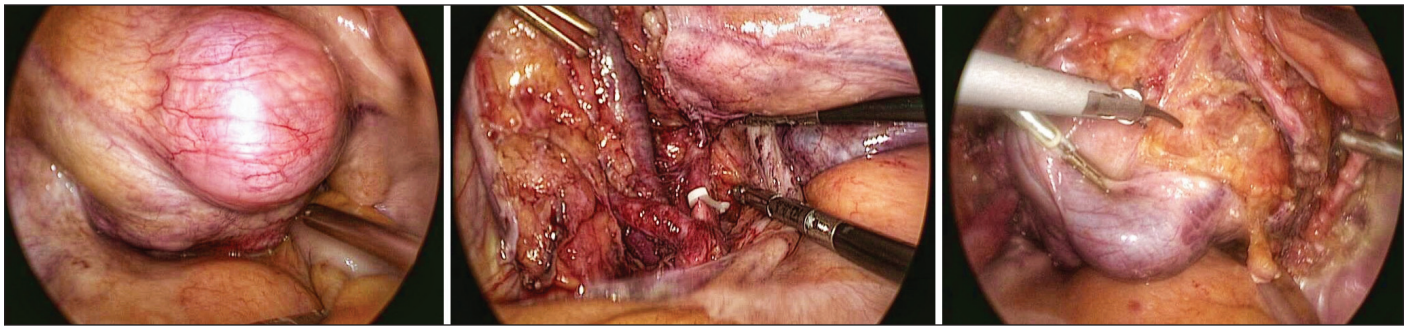

Fig. 3. Total laparoscopic resection of a giant solitary fibrous tumor of the seminal vesicle (part 1).

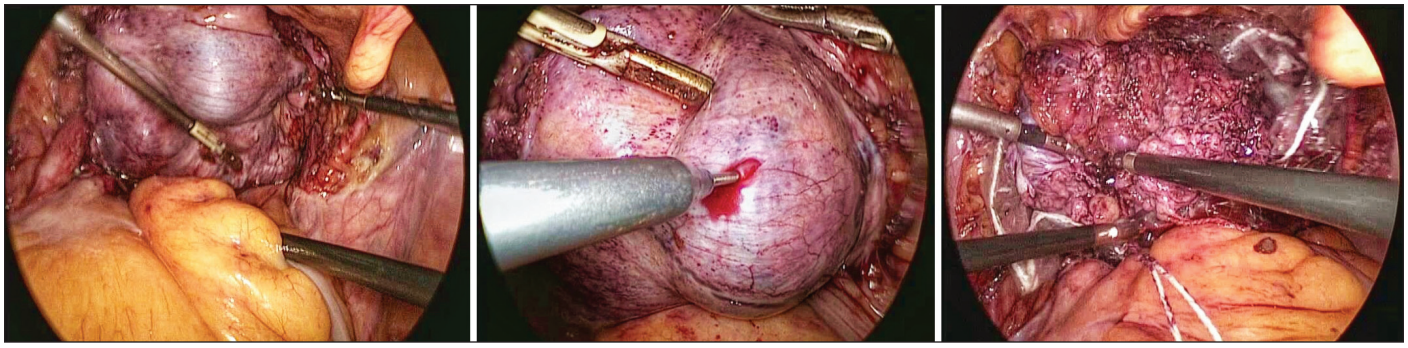

Fig. 4. Total laparoscopic resection of a giant solitary fibrous tumor of the seminal vesicle (part 2).

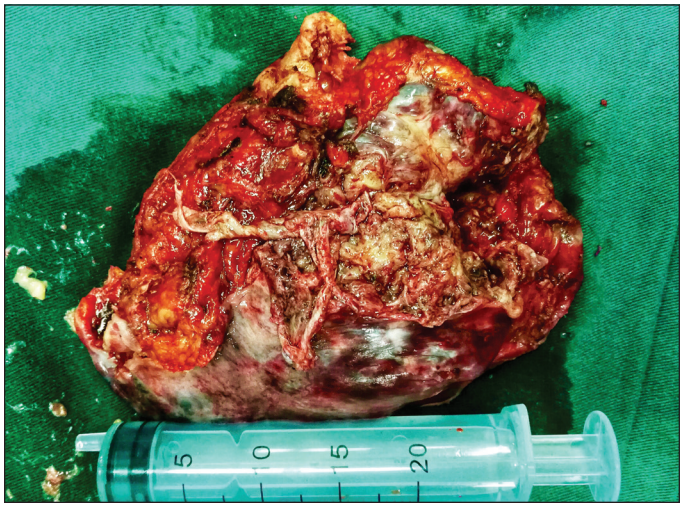

Fig. 5. The gross specimen was a grey and taupe-colored nodule with a membrane.

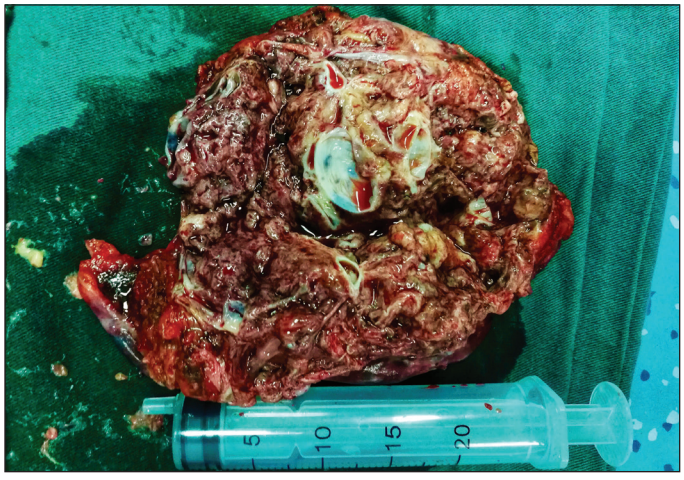

Fig. 6. The cystic, solid mass had a grey surface and a rough texture.

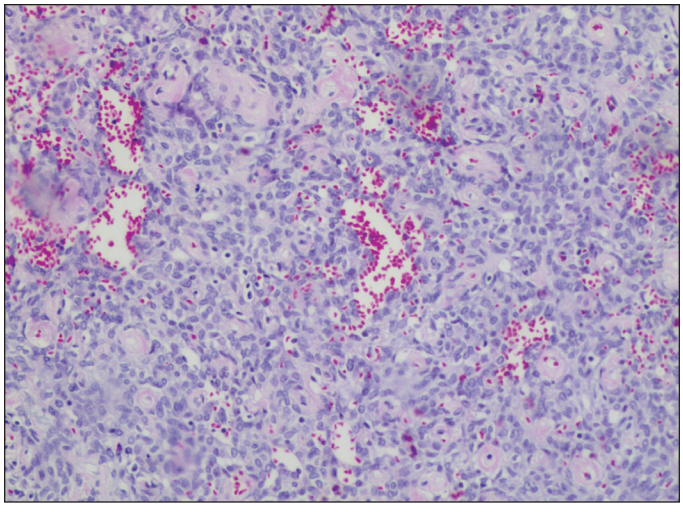

Fig. 7. Histological slides (hematoxylin phloxine saffron stain) at 10× magnification from surgical pathology, demonstrating that the tumor cells were flat with fusiform, round, and oval shapes.

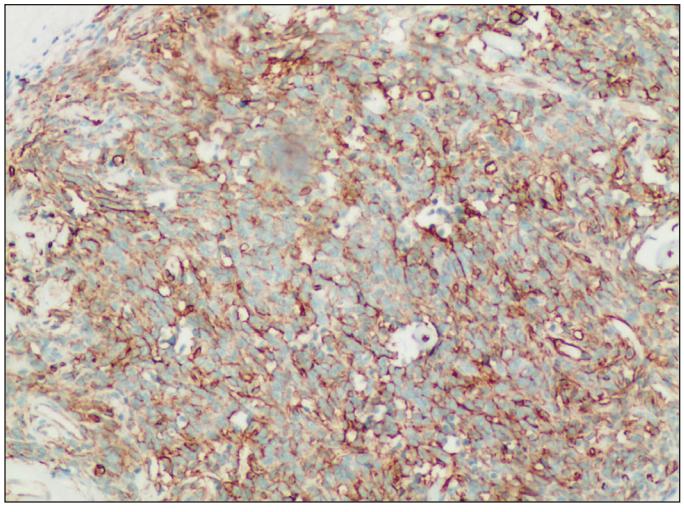

Fig. 8. Diagram of immunohistochemistry results.

2. Perform multiple point puncture and suction of the cystic component of the tumor intraoperatively and try to completely remove the cystic fluid, which reduces the volume of the tumor, provides more space for the operation, and creates favorable conditions for complete laparoscopic resection.
3. Since the location of the seminal vesicle is quite deep and the mass is very large, care should be taken to avoid damage to the rectum during the operation. Denonvillers' fascia should be carefully dissected during the operation, and the tumor root should be cut off in the potential gap between the bottom of the tumor and the intrinsic fascia of the rectum.

Conclusions

The patient in this case underwent complete resection of the tumor by laparoscopic surgery, and postoperative pathological results suggested that it was a SFT of the seminal vesicle. The biological behavior of SFTs is difficult to predict, so the postoperative followup should be conducted for long-term.

Competing interests: The authors report no competing personal or financial interests related to this work.

This paper has been peer-reviewed.

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