Multidisciplinary treatment of giant presacral solitary fibrous tumour: a case report and literature review

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Abstract

Solitary fibrous tumours (SFTs) usually occur at the pleura. Extrapleural sites, particularly giant extrapleural solitary fibromas, are more rarely observed in the clinic, and the clinical diagnosis and treatment of this disease is a focus of attention. Herein, the case of a 43-year-old male patient with giant presacral SFT successfully treated by open surgery, and with a final diagnosis confirmed by postoperative pathology and immunohistochemistry, is reported. The patient was followed-up regularly during 5 years after surgery, with no obvious surgical complications, and no tumour recurrence noted on pelvic magnetic resonance imaging. This case provides clinical information that may help in the diagnosis and treatment of complex SFT.

Keywords

Solitary fibrous tumour, multidisciplinary treatment, diagnosis, case report, extrapleural solitary fibroma, open surgery

Introduction

A solitary fibrous tumour (SFT) is a rare spindle cell tumour originating from hematopoietic progenitor cell antigen CD34 (CD34)-positive dendritic cells. SFTs are widely found in human connective tissue, mostly in the pleura, and also in other parts outside the pleura, but rarely appear in the abdominal and pelvic cavity.1,2

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According to the World Health Organisation (2013) classification of soft tissue tumours, SFTs are classified as tumours of fibroblast or myofibroblast origin, belonging to intermediate type (rare metastasis), and approximately 10–20% of them are biologically aggressive. Specific advances in immunohistochemistry and molecular diagnosis have identified CD34 as the most consistent marker in SFT. There are currently no published reports that adjuvant therapy, such as radiotherapy and chemotherapy, has an obvious curative effect on this disease, and surgical therapy is the main means of SFT treatment, which focuses on obtaining a tumour-negative margin. The aim of the present study was to report the case of a male patient with a large pelvic SFT close to the front of the sacrum. Combining the present case with a search of the published literature, the clinical features, imaging findings, treatment and prognosis of pelvic SFT are reviewed.

Case report

This study report complies with CARE guidelines. Written informed consent was obtained from the patient for treatment and for publication of this case report and accompanying images. Due to the nature of this study (case report), the requirement for ethics approval was waived by the First Affiliated Hospital of Guangzhou University of Chinese Medicine ethics committee.

A 43-year-old male patient was admitted to the First Affiliated Hospital of Guangzhou University of Chinese Medicine, Guangzhou, Guangdong, China in March 2016, due to inadvertently finding a lower abdominal tumour about 6 months previously, and having abdominal distention and dysuria for 1 month. Initially, the tumour was hard and fixed without abdominal distension and abdominal pain, however, the tumour gradually increased in size, and abdominal distension, constipation and dysuria began to appear over the subsequent 5 months. After a further month, the patient was hospitalized.

Physical examination showed that the lower abdomen was uplifted, and a large round tumour with a size of approximately 15 cm × 16 cm was palpable, which was hard, fixed, and had poor mobility. The pathology results of tumour puncture biopsy showed no necrosis in the tumour tissue, and clear nuclear division; immunohistochemistry showed that the tumour cells had diffuse CD34 enhancement (+), and were negative for discovered on GIST-1 (Dog-1), mast/stem cell growth factor receptor Kit (CD117), central nerve specific protein S100-β (S-100), actin, and desmin, and the Ki-67 index was approximately 1%. Combining the morphology and immunohistochemical results, the lesion was considered to be a pelvic SFT (Figure 1).

Extrapelvic enhanced magnetic resonance imaging (MRI; Siemens Magnetom Prisma 3.0T Magnetic Resonance Scanner; Siemens Healthcare GmbH, Erlangen, Germany) showed equal or slightly low signal, and low signal in the necrotic area on a T1 weighted image (WI); and showed obvious mixed signal on a T2WI (Figure 2a and b). An enhanced MRI scan showed obvious even enhancement, an irregular liquefied necrotic area with no enhancement, and significantly enhanced tumour cells and vascular aggregation area (Figure 2c). Enhanced abdominal computed tomography (CT; Toshiba Aquilion 64 slice spiral CT scanner) showed a huge, cystic solid mass in the lower abdomen and pelvic cavity, which spanned up to L3 level of the lumbar spine and down to the pelvic floor. The tumour was approximately 153 mm × 118 mm × 212 mm in size, with a clear boundary, and closely related to the anterior edge of the spine. The enhanced scan showed uneven enhancement (Figure 3). Considering the high possibility...
Figure 1. Representative photomicrographs of formalin-fixed, paraffin embedded, haematoxylin and eosin-stained tumour biopsy tissue sections (4-μm thickness) from a 43-year-old male patient, showing: (left image) densely and sparsely distributed tumour cells. The dense area shows dense cells with deep nuclear staining, and the sparse area shows rich collagen fibres (original magnification × 100, scale bar, 625 μm); (right image) tumour tissue composed of dense short spindle cells arranged in bundles. The cells are slightly atypical, and no tissue necrosis or mitosis is shown (original magnification × 400, scale bar, 100 μm). Pathological biopsy guided by B-ultrasound at a different hospital led to the mass being considered a (pelvic) solitary fibrous tumour.

Figure 2. Representative magnetic resonance images from a 43-year-old male patient, showing: (a) T1 weighted image with equal or slightly low signal, and necrotic area with low signal; (b) T2 weighted image with obvious mixed signal and (c) T1 enhanced scan with obvious uneven enhancement, irregular liquefied necrotic area with no enhancement, and significantly enhanced tumour cells and vascular aggregation area.

Figure 3. Representative plain pelvic enhanced computed tomography scans from a 43-year-old male patient, showing: (a and b) a large cystic, solid mass in the lower abdomen and pelvic cavity of approximately 153 × 118 × 212 mm in size and with a clear boundary, spanning from the lumbar spine L3 level down to the pelvic floor, and closely related to the anterior edge of the spine and (c) uneven enhancement.
of neurogenic tumours, it was also necessary to exclude mesenchymal malignant tumours.

Combining the investigative results with the patient’s condition, metastasis was considered, and malignant tumours from mesenchymal sources were not excluded. If conservative treatment was adopted, progressive expansion of the tumour would have led to more obvious compression symptoms. Large tumours also have the risk of rupture and infection, which may also seriously threaten the life of the patient. Considering the above factors, surgical resection was considered to be the best treatment at the time. The patient was informed of this treatment plan and agreed to the therapy. In view of the above considerations, a multidisciplinary treatment (MDT) approach was employed to further evaluate the operation risk and make sufficient preoperative preparations. The MDT involved experts from the Departments of Imaging, Vascular Intervention, Gastroenterology, Anaesthesiology, and Urology, with their respective contributions to the evaluation of treatment risk and preoperative preparations summarised as follows:

Imaging: Whole abdominal enhanced CT revealed a large cystic, solid mass in the pelvis and abdomen. During CT angiography arterial phase imaging, more thickened and tortuous blood supply arteries, mainly from the inferior mesenteric artery and bilateral internal iliac artery branches, were observed. The tumour mass was noted to push the surrounding tissue, the middle and lower segments of the left ureter were moved to the left front, and the bladder moved to the right front. The tumour was rich in blood supply, and was considered to be a spindle cell tumour derived from retroperitoneal mesenchymal tissue.

Vascular Intervention: Due to the large tumour size, rich blood supply, and increased bleeding estimated during the operation, a catheter balloon was recommended to be placed in the internal iliac artery, and balloon blocking to be performed as appropriate to the actual intraoperative situation, to reduce the risk of intraoperative bleeding.

Gastroenterology: The patient had obvious symptoms of intestinal compression, and the tumour was observed to be huge and compressing the colon and rectum. The surgical indications were clear. If the tumour was found to significantly erode the colon and rectum, it was suggested that this part of the intestine should be removed and may require fistulation.

Anaesthesiology: The patient presented with a large tumour in the pelvis and abdomen. The operation time was estimated to be long, with significant bleeding. Replacement blood was recommended to be fully prepared before the operation. Postoperatively, patient transfer to the intensive care unit for further life support treatment was stated to be required.

Urology: Considering the combined data from examination of the patient, it was unclear whether the tumour invaded the ureter. It was recommended that a double-J catheter should be placed before the operation to effectively avoid the occurrence of a urinary fistula caused by accidental injury to the ureter during the operation. If, during the operation, the tumour was found to invade the ureter, it was recommended to treat the patient by intraoperative consultation and operation.

According to MDT discussions, angiography and bilateral internal iliac artery balloon embolization were performed prior to surgery to reduce the risk of intraoperative bleeding, and cystoscopy was performed before tumour resection. A double-J ureteral tube was planned to be placed, but the ureter was severely squeezed by the tumour, resulting in the failure of ureteral catheter placement. Therefore, the large tumour in the pelvic cavity was carefully removed to avoid damaging the ureter as much as possible. During the operation, the tumour was
found to be tough, the surface blood vessels were dilated, the surface of the tumour envelope tissue was smooth, and the tumour size was approximately $16\,\text{cm} \times 12\,\text{cm} \times 20\,\text{cm}$. The tumour was found to compress and adhere to the left ureter, and the left ureter was expanded. The bladder and part of the colon were noted to be pushed to the right side of the abdomen. During surgery, the tumour was found to be ruptured and was resected in blocks (Figure 4).

Intraoperative blood loss was approximately $11\,000\,\text{ml}$. Pathology results from postoperative analyses of tumour specimens showed that the tumour was composed of spindle cells with thick collagen fibre bundles. Immunohistochemical examination showed that the cells were strongly positive for CD34 (+++), apoptosis regulator Bcl-2 (Bcl-2; +++), and vimentin (+++), and the Ki-67 index was $<1\%$. The cells were found to be negative for smooth muscle actin (SMA), S-100, platelet endothelial cell adhesion molecule-1 (CD31), and cytokeratin (CK), and the pathological diagnosis was a pelvic SFT (Figure 5).

The patient recovered well following surgical treatment, with normal urination and defecation function and no operation-related complications. After follow-up, MRI showed no tumour recurrence 5 years after the operation (Figure 6).

**Discussion**

A solitary fibrous tumour (SFT) is a rare mesenchymal spindle cell tumour. First found to originate from the pleura, and first reported by Klemperer and Coleman in 1992, SFTs were later found to be widely distributed in human connective tissue, with 30% occurring in extrapleural parts, such as the liver, peritoneum, thyroid, cerebellum, and vagina. Most SFTs are benign, with low incidence of malignancy and metastasis. However, van Houdt et al. suggested that tumour location and diameter are risk factors affecting

![Figure 4](image-url). Representative intraoperative images from pelvic tumour resection in a 43-year-old male patient, showing (a) the smooth tumour capsule and dilated surface blood vessels; (b) the close adherence of the tumour to the surrounding tissues; (c) free protection of the compressed ureter and (d) the ruptured tumour being removed in blocks.
prognosis, and proposed that retroperitoneal SFTs tend to be larger than those that occur elsewhere. Tumour size ≥10 cm is considered to be an important basis for judging benign and malignant tumours, or a predictor of poor metastasis prognosis, and tumour diameter greater than 7.25 cm has been shown to be associated with distant metastasis and disease-specific death. SFTs are reported to have an average mass of approximately 10.6 cm, and a malignant SFT displays active tumour cell proliferation, rapid growth and large volume. For SFTs with large diameter, particularly exceeding 15 cm, the malignancy may increase, with an increased metastasis rate. At this time, it is necessary to be highly vigilant against the possibility of malignancy. A clinical study of 110 cases of pleural and extrapleural SFT found that the metastasis rate of SFT at 5 and 10 years was approximately 26% and 45%, the overall survival

Figure 5. Representative photomicrographs from a 43-year-old male patient showing: (a) haematoxylin and eosin-stained pelvic tumour cells with small branching vessels, spindle tumour cells arranged in bundles, and without obvious cell atypia (original magnification, ×100) and (b) immunostained pelvic tumour cells with diffuse positivity for hematopoietic progenitor cell antigen CD34 (original magnification, ×100).

Figure 6. Representative pelvic magnetic resonance images from a 43-year-old male patient who received surgical resection for a pelvic solitary fibrous tumour, showing no obvious abnormality at a 5-year postoperative follow-up.
rate was approximately 89% and 73%, and the development and prognosis of SFT could be difficult to predict.\textsuperscript{10}

Growth of SFTs is generally slow, and the incidence rate is comparable between males and females, however, incidence rates are higher in middle-aged patients than in younger patients.\textsuperscript{11} Because most SFTs are not accompanied by pain, they are often difficult to detect. In addition to the pleura, SFTs have been found in multiple anatomical positions. SFT clinically manifests as an isolated soft tissue mass, with quasi circular, or irregular, expansive growth, clear boundary, and envelope- or envelope-like structure on the tumour surface. Although the SFT may be situated anywhere in the body, the tumour volume in the pelvic and abdominal cavities is often large, and the maximum diameter can reach over 10 cm.\textsuperscript{12} Patients often have abdominal discomfort, sacroccyegeal pain, or defecation disorder due to tumour compression and the pushing of surrounding organs, and a few patients have accessory tumour syndrome. The most common symptoms are hypoglycaemia of nonislet cells, hypertrophic osteoarthropathy, or clubbing fingers.\textsuperscript{13} In the present case, the tumour diameter was approximately 20 cm. Abdominal distension, constipation, and dysuria were caused by compression of the intestine and bladder, but there was no paraneoplastic syndrome.

Because the clinical symptoms of SFT are not specific, imaging examination remains the main method of diagnosing SFT. On colour Doppler ultrasound, SFT often shows a clear boundary, no calcification, and a uniform hypoechoic or uneven tissue mass. Although SFT cannot be accurately diagnosed, ultrasound has important clinical significance for initial diagnosis, differential diagnosis, and guiding tissue puncture biopsy;\textsuperscript{14} CT examination may directly reveal the size, shape, essence, and location of tumours. However, tumours of different properties also have different CT manifestations that do not have specificity for the diagnosis of SFT.\textsuperscript{15} Lesions with nonuniform density can be seen on plain CT scan; most of the tumour body shows soft tissue density, the cystic necrotic area exhibits low density, and haemorrhage and calcification are rare. Due to a rich tumour blood supply, SFT lesions show a characteristic ‘fast in and slow out’ enhancement mode in multi-phase or dynamic enhanced scanning, that is, the solid components of the tumour display uneven and obvious enhancement, while the venous phase and delayed phase shows continuous enhancement.\textsuperscript{16} Compared with CT, MRI exhibits a better resolution for soft tissue tumours. SFT shows equal or slightly low signal on T1WI and mixed-strip high signal in equal or slightly low signal on T2WI. SFT has sometimes been reported to exist in two types, fibrous SFT and cellular SFT, with different imaging manifestations. T2 low signal may be seen in fibrous SFT, showing progressive and uneven enhancement; while cellular SFT may show T2 hyperintensity and rapid and uniform enhancement.\textsuperscript{17} However, imaging examination lacks specificity and sensitivity in the diagnosis of tumour nature and origin. In the present case, a well-defined cystic, solid mass was found on the preoperative CT, and the enhanced scan showed uneven enhancement; MRI showed equal or slightly low signal on T1WI, a low signal in the necrotic area, an obvious mixed signal on T2WI, and obvious uneven enhancement on the enhanced scan, which was in line with imaging characteristics of SFT reported in the literature.

The diagnosis of SFT depends on histopathological examination and immunohistochemical results. The pathogenesis of SFT remains unclear, though is generally believed to be related to generation of the NGFI-A binding protein 2 (\textit{NAB2})–signal transducer and activator of transcription
6 (STAT6) fusion gene by paracentric inversion of chromosome 12q13. Microscopically, SFTs are found to be variable cellular tumours, composed of ovoid to spindled cells exhibiting patternless growth or a storiform pattern against a variably collagenous background stroma containing thin-walled large branching, ‘staghorn’-shaped blood vessels. SFT is a tumour derived from CD34-positive dendritic stromal cells that can differentiate into fibroblasts. Therefore, CD34 is considered a specific marker of SFT, but CD34 is also expressed in many other tumours, such as neurofibroma, schwannoma, and cutaneous fibrosarcoma. STAT6 has been introduced as a diagnostic marker for SFT. Molecular diagnostics of the NAB2–STAT6 gene and immunohistochemical analyses of nuclear STAT6 may be beneficial in diagnosing SFT, particularly in cases that are not clearly classified. STAT6 is shown to be both a sensitive and particular marker in the histopathologic diagnosis of SFTs. An immunohistochemical study to detect STAT6 expression in SFT reported a positive rate of 100% (49/49), indicating that STAT6 may be highly sensitive in SFT detection. Ding et al. found that STAT6 expression in SFT had higher sensitivity and specificity than CD34, CD99 molecule (Xg blood group) (CD99) and BCL2. In addition, STAT6 protein has been shown to be the most sensitive and specific marker for diagnosing conventional and malignant SFT, and CD34 combined with STAT6 is helpful in improving the specificity and sensitivity of SFT diagnosis. In immunohistochemistry, although CD34 and Bcl-2 are found to be positive in SFT, they have been shown to lack high specificity and sensitivity. CD34 positivity may be used as an important index for the diagnosis of SFT. When CD34 is negative, CD99 and Bcl-2 positivity are conducive to the diagnosis of SFT. In an immunohistochemical study of 43 cases of SFT in different parts of the body, the Ki-67 index was found to have a potential role in identifying benign and malignant SFTs. As an important marker of the proliferative activity of tumour cells, it can help in understanding the biological behaviour of tumours and judging the prognosis. Therefore, immunohistochemistry often uses CD34 combined with vimentin, CD99, and Bcl-2 as the basis for SFT diagnosis, with Ki-67 index as a marker of SFT cell proliferation rate. Results of a literature search revealed that CD34 and Bcl-2 are important markers for the pathological diagnosis of SFTs (Table 1). The postoperative pathological immunohistochemistry of the present case showed the tumour cells to be strongly positive for CD34 (+ + + +), Bcl-2 (+ + + +) and vimentin (+ + + +), while the Ki-67 index was low, indicating that the pathological diagnosis of this patient was in line with the diagnosis of benign SFT reported in the literature. The proliferation of SFT cells was not high, and there was a low trend of malignant lesions, suggesting a good prognosis. Most SFTs have benign biological features, but some are malignant, including about 10–15% of extrapleural SFTs. Clinically, benign pelvic SFT is often differentiated from gastrointestinal stromal tumours and schwannoma. Gastrointestinal stromal tumours have diverse shapes, clear boundaries, and uneven density, and are prone to cystic degeneration or necrosis. Plain CT scans show uneven enhancement, and abnormal vascular shadows are seen in the arterial phase. In addition, gastrointestinal stromal tumours often show spindle to ovoid cells arranged in fascicles or randomly distributed. CD34 expression is shared by gastrointestinal stromal tumours and SFTs, however, the majority of gastrointestinal stromal tumours are positive for CD117 and Dog-1 while STAT6 is always negative. Schwannomas tend to occur in the retroperitoneum, and are mostly distributed along the nerve. The tumour boundary of schwannoma is clear with a smooth edge, and with a complete capsule that is prone
| Author            | Study population, n (M/F) | Surgical Year | Age, years | Symptom                                      | Tumour size, cm | Pathological/Immunohistochemistry features                                                                 |
|-------------------|----------------------------|----------------|------------|----------------------------------------------|----------------|-----------------------------------------------------------------------------------------------------------------------------------|
| Klemperer et al.  | 5 (3/2)                   | 1919–1926      | 48 (26–53) | Pain in the chest and shadow in the right side of the chest | 7 × 8 × 5 to 25 × 19 × 12 | Mesenchymal structure and originate from the subpleural areolar tissue.                                                          |
| Demicco et al.    | 103 (51/52)               | N/A            | 52 (19–81) | Tumours in abdomen, pleura, head, neck and trunk | 10.3 (1–40)    | Most tumours were at least moderately cellular, with only three cases demonstrating uniformly low cellularity and 51 cases being highly cellular. Necrosis was present in 37 cases, marked nuclear pleomorphism in 12, and distinct, sharply demarcated poorly differentiated areas were seen in three cases. Mitotic figures ranged from 0 to 23 per 10 high-power fields. |
| Eltawil et al.    | 1                         | N/A            | 63         | Periumbilical pain and nausea                 | 11.4 × 6.8 × 6.6 | Negative from CD31, ASMA, S100, AE1/AE3, calretinin, desmin and CD117, positive for vimentin, Bcl-2 and CD34.                    |
| Badea et al.      | 1                         | N/A            | 57         | A large solitary mass of the left hemithorax  | 12 × 8          | Reactive for vimentin and stained strongly and consistently for CD34 and Bcl-2.                                                   |
| Sugita et al.     | 43 (21/22)                | N/A            | 56 (19–82) | Tumours occurred in intrathoracic, intra-abdominal, central nervous system, extremity, head, neck and trunk | 4.5 (1.0–16.0) | All SFTs showed different degrees of STAT6 positivity in tumour nuclei. Two cases of dedifferentiated SFT showed nuclear STAT6 expression in the conventional SFT region, but no STAT6 expression or CD34 expression in the dedifferentiated region; All SFTs showed some degree of Ki-67 positivity, ranging from less than 1% to 72%. The two dedifferentiated SFTs showed significantly high Ki-67 in the dedifferentiated region. |

Data presented as n or median (range).
M/F, male/female; N/A, data not available; CD31, platelet endothelial cell adhesion molecule; ASMA, antismooth muscle antibody; S100, central nerve specific protein S100-β; AE1/AE3, anti multi-cytokeratin antibodies; CD117, mast/stem cell growth factor receptor Kit; CD34, hematopoietic progenitor cell antigen CD34; Bcl-2, apoptosis regulator Bcl-2; STAT6, signal transducer and activator of transcription 6.
to cystic changes. CT scans mainly focus on cystic and solid changes. After dynamic enhancement, the solid part shows progressive enhancement, the cystic part does not strengthen, and the enhanced scan is characterized by mild enhancement. Some Schwannoma cases may show CD34 expression. The presence of thick fibrous vesicles, foam-like macrophages, lymphoid infiltrates, tapered wavy nuclei and S100 expression are helpful for the diagnosis of schwannoma. Malignant pelvic SFT should be differentiated from undifferentiated pleomorphic sarcoma and leiomyosarcoma. Undifferentiated pleomorphic sarcoma, also known as malignant fibrous tissue lymphoma, mostly occurs in elderly men. CT scans show that the tumour boundary is relatively well-defined, segmented, and sometimes osmotic. Tumour centres typically show low attenuation, suggesting necrosis, haemorrhage, and mucous degeneration. Due to the different composition, MRI results often show uneven signals across all sequences. After the administration of contrast agent, the solid composition of the tumour shows enhancement. Leiomyosarcoma shows invasive growth, blurred boundaries, necrosis, and bleeding, with a large lobulated solid mass on CT, generally containing cystic space or necrosis. MRI mainly shows an equal signal on T1WI, with cystic and flare low signal inside. T2WI often shows slightly high or high signals, and enhanced scanning shows mild to obvious delayed enhancement.

At present, the main treatment for pelvic SFT remains surgical intervention, in order to completely remove the tumour and negative margins and avoid damaging the surrounding tissues and organs or other important structures. Benign and noninvasive solitary fibrous tumours generally will not recur or metastasize after complete resection. Invasion of the surgical margin has been reported to be the highest predictor of local recurrence. Therefore, complete surgical resection with negative surgical margin should be ensured to reduce or avoid the risk of local recurrence after surgery, and the surgical method should be formulated according to the location, size, and boundary of the tumour. Whether the tumour is completely removed also directly affects the prognosis. For SFTs with large volumes and difficult operations, intra-arterial embolization may be used to strive for surgical treatment.

Solitary fibrous tumours are mesenchymal neoplasms usually originating from the visceral pleura but can occur at various extrapleural sites. They are usually slow-growing with favourable prognoses, but approximately 10–20% develop malignancy. Tumours with a diameter >10 cm are shown to have a higher metastasis rate, while invasive growth, abundant and dense tumour cells, common mitotic images (>4 per 10 high power fields), cell atypia, nuclear pleomorphism, and/or interstitial or vascular invasion, necrosis or bleeding, are considered to be the malignant biological manifestations of SFT, and having one or more of the above histological features indicates the presence of malignant lesions. Therefore, the histological conformation of SFT cannot completely and accurately predict its prognosis, and patients should be followed-up regularly. Based on the analysis of 219 cases of multisite SFT, the location and size of the tumour are considered to be important risk factors affecting the prognosis, while thoracic, abdominal, and retroperitoneal SFTs carry a higher risk of distant metastasis and recurrence, and postoperative recurrence is greater for SFTs with diameters >8 cm. In the present case, the maximum diameter of the tumour was approximately 20 cm, although the pathological and immunohistochemical results suggest benign SFT. However, the large tumour size and severe adhesion with surrounding organs and tissues still suggests a
certain tendency of recurrence and metastasis. Thus, close follow-up was needed after the operation.

In conclusion, the present case report supplements previously published reports of SFTs. An SFT is a rare tumour that may be found on B-ultrasound, CT, and MRI, but its diagnosis still depends on pathological examination. In the present case, the histopathological and immunohistochemical results after the operation indicated that the tumour was consistent with benign SFT. However, regular follow-up was required due to the large tumour size. In our experience, it is important and necessary to seek MDT for complex SFT, in order to be well-prepared prior to surgery. Only by formulating the best individualized treatment plan in multiple dimensions can a satisfactory prognosis be obtained.

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Author contributions
HJF and ZMW collected and analysed the case data and wrote the manuscript, and contributed equally to this work; ZQC and BF edited and reviewed the manuscript. JQL, RYL, YL and CZY collected and analysed the data. All authors read and approved the manuscript.

Declaration of conflicting interests
The authors declare that there is no conflict of interest.

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