J Med Sci 2023;43 (4):186-189
DOI: 10.4103/jmedsci.jmedsci_192_22

CASE REPORT

Solitary Fibrous Tumor in the Preperitoneal Space Mimicking an Intra-abdominal Tumor

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Solitary fibrous tumors (SFTs) are uncommon fibroblastic mesenchymal neoplasms that rarely metastasize. They were primarily considered intrathoracic tumors; however, recent studies have reported SFTs in extrathoracic locations. This report describes a rare case of an SFT in the preperitoneal space that mimicked an intra-abdominal tumor radiographically. A 67-year-old woman was diagnosed with an extrahepatic tumor through ultrasonography. Computed tomography revealed a nodule near the liver's left lobe at the upper abdominal midline. Laparoscopic tumor resection was performed to minimize undersampling and tumor seeding. Laparoscopy revealed a well-circumscribed tumor located in the preperitoneal space. The tumor was resected *en bloc* with a macroscopically negative margin. Histopathological examinations confirmed an SFT using immunohistochemistry. Adjuvant treatment was not administered. No residual lesions were reported at the 6-month and 1-year follow-ups. Although SFT rarely metastasizes, early diagnosis and treatment of SFTs should be emphasized to ensure optimal patient outcomes.

Key words: Solitary fibrous tumor, preperitoneal space, neoplasms, laparoscopy, case report

INTRODUCTION

Solitary fibrous tumors (SFTs) are uncommon soft-tissue tumors. SFTs have historically been thought of as intrathoracic tumors.[1] However, SFTs are now considered ubiquitous throughout the body, including the viscera and soft tissue, albeit with a propensity for body cavities, including the pleura, meninges, and abdominal cavity.[2] Despite mainly behaving indolently, SFTs are notoriously difficult to diagnose, given their nonspecific symptoms and radiographic features.[3] Diagnosis is confirmed by histopathology. Complete *en bloc* surgical resection remains the standard treatment for all localized resectable SFTs.[4] This case report presents an atypical SFT originating in the preperitoneal space that mimicked an intra-abdominal tumor radiographically.

CASE REPORT

In July 2020, a 67-year-old female patient underwent follow-up abdominal ultrasonography for renal colic, which led to the discovery of a well-defined hypoechoic mass-like lesion measuring 3.1 cm × 2.3 cm adjacent to the liver within the anterior aspect of segment three. On physical examination, the extrahepatic mass was nontender and nonpalpable. The patient's hepatic, pancreatic, and renal functions were normal. No elevated serum tumor marker levels were observed. Computed tomography revealed a well-limited lesion at the upper abdominal midline adjacent to the left lobe of the liver, causing mild displacement [Figure 1].

During the dynamic study, the lesion showed progressive enhancement without washout. Despite being asymptomatic, the mass continued to expand. Due to the fear of malignant degeneration, the patient was advised to undergo surgical resection of the mass since core biopsy may lead to tumor seeding and undersampling. Hence, a three-port laparoscopic tumor resection was attempted. Laparoscopy revealed a well-limited tumor located near the falciform ligament [Figure 2]. Although the mass partially perforated into the intra-abdominal cavity, it

Received: August 31, 2022; Revised: November 30, 2022; Accepted: December 02, 2022; Published: January 20, 2023
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How to cite this article: Hu CT, Ho MH, Hsieh CB. Solitary fibrous tumor in the preperitoneal space mimicking an intra-abdominal tumor. J Med Sci 2023;43:186-9.

was mainly encapsulated by the peritoneum without connecting to other intra-abdominal organs. The tumor was resected *en bloc* with a macroscopically negative margin. Grossly, the mass had yellow and soft consistency. It contained one gray, lobulated tumor measuring 3 cm × 1.2 cm in size, with its cut surface displaying a visibly pale and fleshy appearance [Figure 3].

A histological examination of the surgical specimen revealed a scattering of nonatypical spindle cells in the fibrous stroma without definite architecture [Figure 4]. Microscopically, the sections showed proliferative spindle cells with marked collagenous components and focal epithelioid features. Tumor necrosis was absent.

Immunohistochemical staining confirmed strong expression of CD34 [Figure 5], CD99, and Bcl2 in tumor cells, and above all, signal transducer and activator of transcription six [Figure 6], which is a highly sensitive and specific marker for SFT.[4]

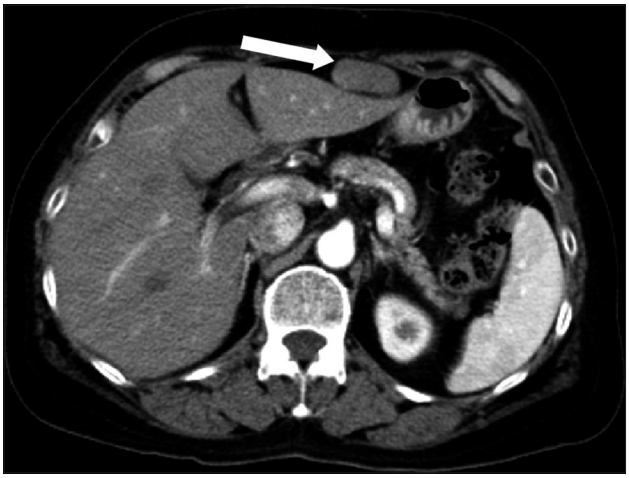

Figure 1: A CT scan showing a well-limited lesion on the anterior aspect of segment three in the liver. CT = Computed tomography

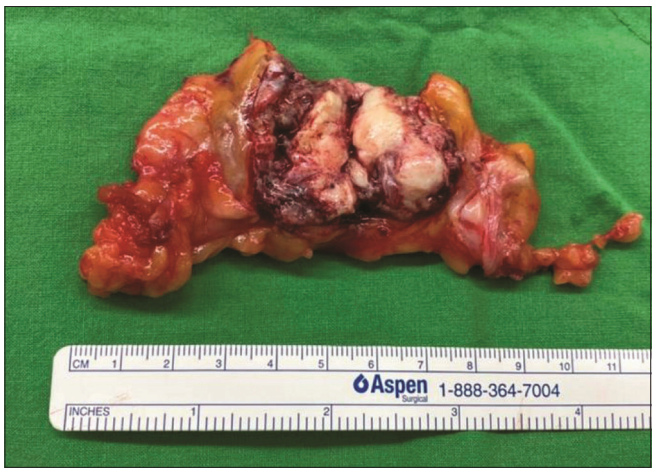

Figure 3: The resected specimen presenting with a pale and fleshy appearance

No expression of MDM2 and CDK4 was observed. Both MDM2 and CDK4 are commonly found in well-differentiated and dedifferentiated liposarcomas. No morphological atypia was observed. The cells had a medium density and a low mitotic rate, approximately two mitoses per 10 high-power fields.

SFT was confirmed histopathologically. The patient's postoperative course was smooth. No adjuvant radiation or chemotherapy was prescribed. At the time of writing this manuscript, the patient was alive and well. Ultrasonography did not reveal any tumor recurrence at the 6-month and 1-year follow-ups.

DISCUSSION

SFTs are rare fibroblastic spindle cell neoplasms that can manifest in various soft tissue and visceral locations. Pleural–thoracic SFTs constitute 30% of all SFTs, followed by meningeal SFTs, which constitute 27% of cases.[2] SFTs may be

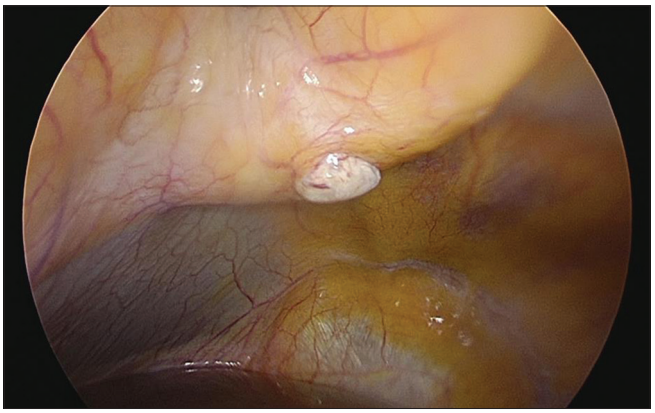

Figure 2: Laparoscopy revealed a well-capsulated tumor near the falciform ligament

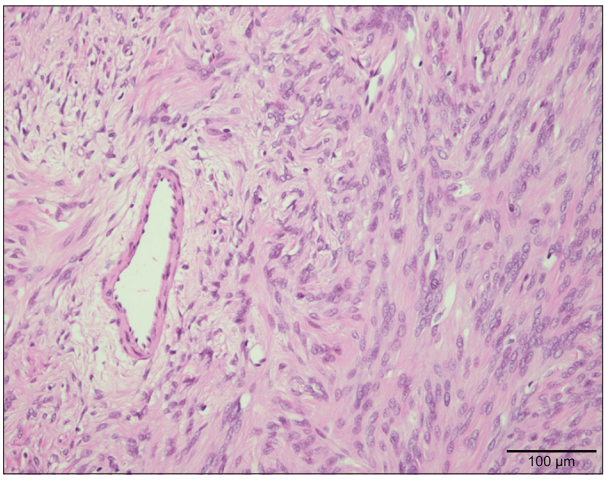

Figure 4: Microscopically, the specimen contains proliferative spindle cells with marked collagenous components (hematoxylin-eosin stain ×200)

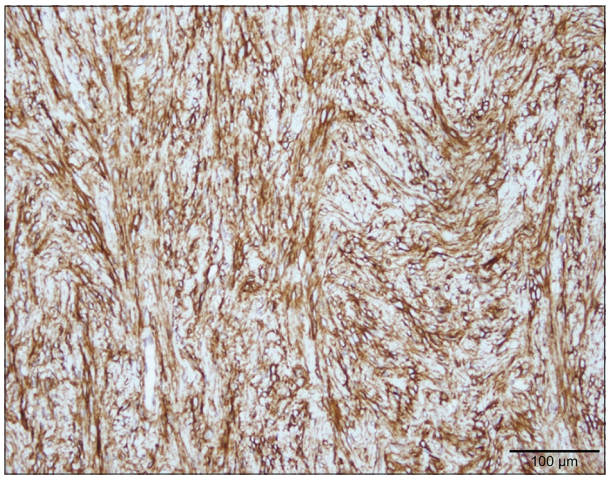

Figure 5: CD34 staining of specimens

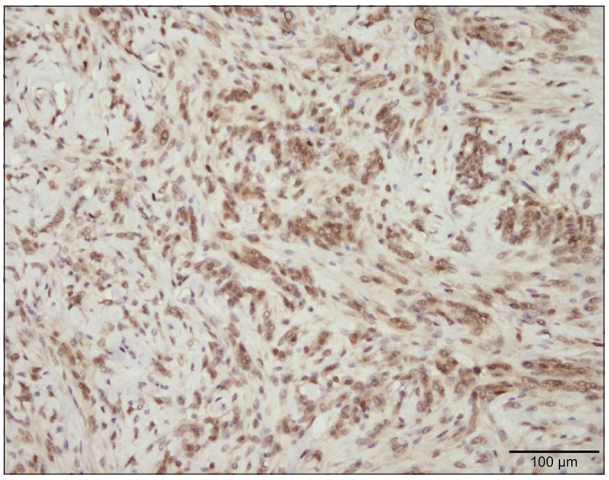

Figure 6: Specimens stained for STAT6. STAT6 = Signal transducer and activator of transcription 6

present in the abdominal cavity in 20% of all cases, although most occur in the retroperitoneal and pelvic cavities.[5] SFT within the preperitoneal space of the abdominal wall has been rarely reported. In our case report, the SFT radiographically mimicked an intra-abdominal tumor while developing in the abdominal wall.

The preperitoneal space is between the parietal peritoneum and the transverse fascia of the abdominal wall. In the preperitoneal space, desmoid tumors and soft-tissue sarcomas are the most common soft-tissue neoplasms.[6] Given the rarity of SFTs, their diagnosis in the abdominal wall or within the intra-abdominal cavity can be challenging since small tumors are usually nonpalpable and typically asymptomatic.

The computed tomography images of reported SFTs displayed highly similar features to our case. Similarities included well-limited margins, minimal invasion of adjacent structures, and avid contrast enhancement.[3] However, these imaging findings could be similar to those of other soft-tissue tumors, and there is no standardized pathognomonic features characteristic of SFTs. A definitive diagnosis requires histological confirmation. In most cases, a core biopsy will provide sufficient diagnostic material to establish a diagnosis of SFT. Nevertheless, the limited sample provided by core biopsy may not accurately present the histologic evidence indicative of a high risk for aggressive tumor behavior. Therefore, SFTs are generally diagnosed and treated by complete local surgical excision.

Extrathoracic SFTs have traditionally been regarded as their indolent intrathoracic counterparts; however, studies report extrathoracic SFTs to have a higher recurrence rate than intrathoracic SFTs.[7]

Several risk assessment models have been used to assess the prognosis of extrathoracic SFTs, including the Demicco and French Sarcoma group models.[8,9] Patients were stratified into low-, moderate-, and high-risk groups for metastasis development based on these models that take patients' age, sex, tumor mitosis rate, site, size, and necrosis into account. Our patient was low-risk according to these models (a total point of two in the Demicco model: two mitoses per 10 HPF = 1, age 67 = 1, size 3 cm = 0, and necrosis <10% = 0), with a 5-year survival rate of almost 80% after complete excision.[10] For patients with complete resection and no high-risk histologic features, postoperative surveillance by ultrasonography or computed tomography was offered rather than adjuvant radiation therapy or chemotherapy since data supporting the benefits of these treatments are lacking. Should nodal or distal metastasis be suspected and positron emission tomography/computed tomography could be used to assess the disease status after the initial treatment. To the best of our knowledge, no studies conducted so far have addressed the optimal frequency of posttreatment surveillance. We follow the posttreatment surveillance guidelines for soft-tissue sarcoma outlined by the National Comprehensive Cancer Network. For low-risk individuals, the local tumor site is imaged every 6 months for 3 years, then yearly through year 5. After 5 years, we do not frequently repeat local imaging due to the low risk of local recurrence at that time.

CONCLUSION

This report describes a rare case of an SFT in the preperitoneal space mimicking an intra-abdominal tumor surgically removed by laparoscopic excision. Such cases often present diagnostic challenges due to their infrequency and nonspecific features. However, SFTs should be one of the differential diagnoses when confronted with suspicious lesions since timely diagnosis and complete surgical removal ensure the best patient outcomes.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has provided her consent for her images and other clinical information to be reported in the journal. The patient understands that her name and initials will not be published and due efforts will be made to conceal her identity, but anonymity cannot be guaranteed.

Data availability statement

The data that support the findings of this study are available from the corresponding author, CT Hu, upon reasonable request.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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