

# Solitary fibrous tumor of the mesentery: a case report and review of the literature

Journal of International Medical Research

48(10) 1–7

© The Author(s) 2020

Article reuse guidelines:

[sagepub.com/journals-permissions](https://sagepub.com/journals-permissions)

DOI: 10.1177/0300060520950111

[journals.sagepub.com/home/imr](https://journals.sagepub.com/home/imr)

Jing-Ni Liu<sup>1</sup> , Zhao Liu<sup>2</sup>, Peng-Yu Ji<sup>3</sup>,  
Hong Zhang<sup>4</sup> and Shun-Lin Guo<sup>2</sup>

## Abstract

Solitary fibrous tumors are rare mesenchymal tumors that typically arise from the pleura and rarely originate from the mesentery. We herein report a case involving a 66-year-old patient who presented with a mass on the left abdomen. This mass had been incidentally noticed 10 years earlier. The patient sometimes experienced abdominal pain. Physical examination revealed an irregular mass, which was resected. A biopsy of the mass revealed that it was a solitary fibrous tumor originating from the mesentery of the small intestine. The patient was discharged 1 week after surgery and had an uneventful clinical course throughout the 4-month postoperative follow-up.

## Keywords

Solitary fibrous tumor, mesentery, abdominal mass, computed tomography, X-ray, case report

Date received: 30 April 2020; accepted: 24 July 2020

## Introduction

Solitary fibrous tumors (SFTs) are a group of rare spindle cell mesenchymal tumors mainly arising from the thoracic pleura. These are rare ubiquitous tumors that originate from the mesenchyme and are characterized by high fibrosity and hyper-vascularity.<sup>1</sup> Although abdominal SFTs have been reported, involvement of the mesentery is rare.<sup>2</sup> SFTs are usually benign and remain asymptomatic unless they place pressure on adjacent tissues,

<sup>1</sup>The First Clinical Medical College, Lanzhou University, Lanzhou, Gansu, China

<sup>2</sup>Department of Radiology, the First Hospital of Lanzhou University, Lanzhou, Gansu, China

<sup>3</sup>Department of Clinical Laboratory, the First Hospital of Lanzhou University, Lanzhou, Gansu, China

<sup>4</sup>Department of Pathology, the First Hospital of Lanzhou University, Lanzhou, Gansu, China

### Corresponding author:

Shun-Lin Guo, Department of Radiology, The First Hospital of Lanzhou University, No. 1 Donggang West Road, Chengguan District, Lanzhou, Gansu 730000, China.

Email: [guoshl@lzu.edu.cn](mailto:guoshl@lzu.edu.cn)



Creative Commons Non Commercial CC BY-NC: This article is distributed under the terms of the Creative

Commons Attribution-NonCommercial 4.0 License (<https://creativecommons.org/licenses/by-nc/4.0/>) which permits non-commercial use, reproduction and distribution of the work without further permission provided the original work is attributed as specified on the SAGE and Open Access pages (<https://us.sagepub.com/en-us/nam/open-access-at-sage>).

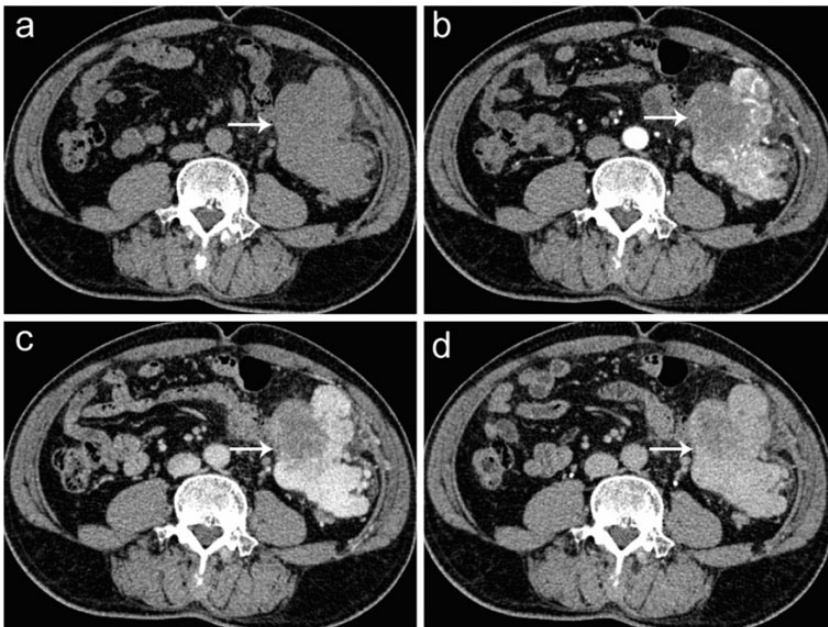
making them hard to detect. Both computed tomography (CT) and magnetic resonance imaging (MRI) can help to diagnose SFTs; however, a definitive diagnosis relies on immunohistopathology, in which STAT6 and CD34 are used as highly specific markers.<sup>3</sup> Macroscopically, most SFTs are well-circumscribed and frequently encapsulated masses. SFTs are typically tan-white, firm, and multinodular in appearance and may exhibit hemorrhagic and myxoid changes.<sup>4</sup> In some instances, SFTs show malignant features and invasion of surrounding tissues.<sup>5</sup> Therefore, complete surgical resection with intact borders is recommended.<sup>6</sup> Because recurrence may occur even 20 years after treatment,<sup>7</sup> long-term surveillance may be beneficial.

### Case report

A 66-year-old man was admitted into the general surgery department with

intermittent abdominal pain. Abdominal CT revealed a soft tissue mass measuring  $101 \times 69 \times 87$  mm and extending along the left lower abdominal peritoneal space (Figure 1). Plain CT revealed an irregular homogeneous low-density mass and surrounding lymph node enlargement (Figure 1(a)). In the arterial phase, numerous blood vessels were observed surrounding the mass. In the venous and delayed phases, the enhancement was seen to extend from the periphery to the center (Figure 1(b)–(d)).

The patient had a >10-year history of a mass on the left abdomen with intermittent pain. The patient could not provide the exact size of the tumor. His abdominal pain was relieved after rest and was not accompanied by diarrhea, constipation, nausea, vomiting, hematemesis, or other abnormalities. However, his abdominal pain had worsened 20 days previously. His stool and urine were normal, and there had



**Figure 1.** Computed tomography images. (a) Plain scan. Transverse image analysis revealed a mass in the left abdominal region (white arrow). (b) Arterial phase. (c) Venous phase. (d) Delayed phase.

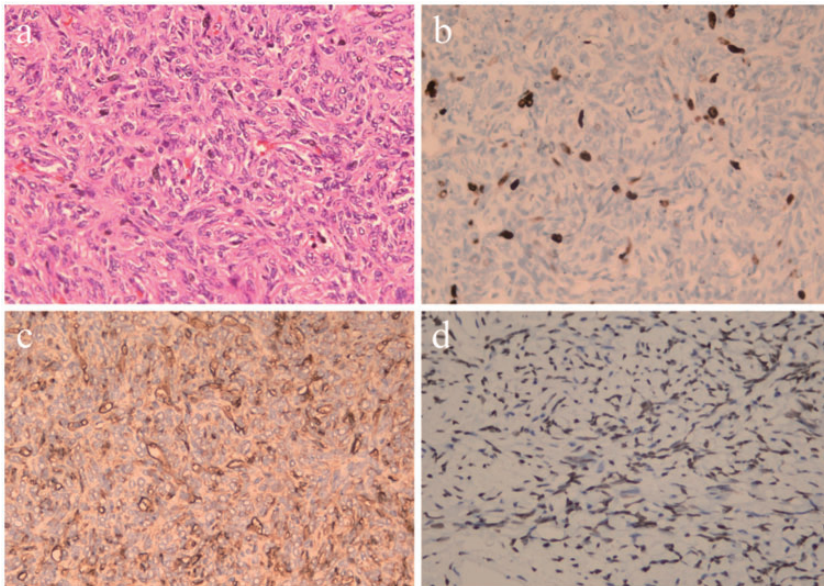
been no significant change in his weight recently. The patient had previously undergone an operation involving the vertebrae and ribs as a result of trauma.

Hematological parameters, biochemical parameters and tumor marker levels (CA125, CA19-9, CA72-4, alpha-fetoprotein, and carcinoembryonic antigen) were normal. Surgical exploration revealed a firm mass in the left abdominal region. The mass originated from the mesojejunum and was enclosed by omental adhesions. Therefore complete tumor resection and partial omentectomy were performed to ensure safe surgical margins. Gross examination of the tumor revealed an incomplete fibrous envelope. Histopathological analysis of the mass revealed spindle-shaped cells with hypocellular and hypercellular regions rich in collagen (Figure 2(a)). Cellular atypia, pleomorphism, and necrosis were observed. Immunohistochemical analysis revealed that the mass was positive

for CD34, STATA6, CD99, and vimentin (Figure 2(c), (d)) and negative for DOG1, her-2, p53, S-100, and CD117. The mass was also negative for pan-cytokeratin and smooth muscle actin, and the Ki-67 index was 40% (Figure 2(b)), indicating that the tumor cells were actively growing in some areas. The surgical margins were clear. The patient was discharged 1 week after surgery without complications and remained disease-free at the end of his 4-month clinical follow-up period.

## Discussion

SFTs most frequently arise from the pleura, but they have also been observed in nearly every anatomical location of the human body.<sup>8</sup> However, an SFT arising from the mesentery is very rare.<sup>7</sup> A comprehensive literature search revealed 21 SFTs of the mesentery (Table 1). Of these, most were found in men, and the affected patients



**Figure 2.** Pathological examination of the neoplasm (magnification: 400 $\times$ ). (a) Spindle-shaped cells with hypocellular and hypercellular areas (hematoxylin and eosin stain). (b) The Ki-67 index was 40%. (c, d) The neoplasm was strongly positive for CD34 and STAT6.

**Table 1.** Reports of solitary fibrous tumors of the mesentery in the English-language literature.

Case No.	Reference	Age (years)/ Sex	Scale (mm)	Mesenteric location	CD34	Histological malignancy	Follow-up
1	Pérez Cabañas et al. <sup>9</sup>	45/M	90	Rectum	+	No	Not reported
2	Hardisson et al. <sup>10</sup>	33/M	80	Small intestine	+	No	6 months/ NROM
3	Nakagawa et al. <sup>11</sup>	83/M	160	Sigmoid colon	+	No	11 months/ NROM
4	Prathima et al. <sup>12</sup>	38/F	20	Ileum, cecum	+	No	Not reported
5	West et al. <sup>13</sup>	61/M	95	Sigmoid colon	+	No	Not reported
6	Ben Fadhel et al. <sup>14</sup>	30/F	12	Small intestine	+	No	5 months/ NROM
7	Balaji et al. <sup>4</sup>	68/M	180	Sigmoid colon	+	Yes	Not reported
8	Soda et al. <sup>15</sup>	27/F	160	Rectum	+	No	1 year/ NROM
9	Lau et al. <sup>16</sup>	53/M	220	Ileum	+	No	1 month/ NROM
10	Medina-Franco et al. <sup>17</sup>	60/F	16	Transverse colon	+	Yes	7 years/ NROM
11	Bouhabel et al. <sup>18</sup>	71/M	155	Small intestine	+	No	12 months/ NROM
12	Kudva et al. <sup>19</sup>	41/M	230	Small intestine	+	No	7 months/ NROM
13	Muroni et al. <sup>20</sup>	73/M	250	Small intestine	+	No	15 days/ NROM
14	Cantarella et al. <sup>21</sup>	26/M	120	Ileum	+	No	18 months/ NROM
15	Nishikawa et al. <sup>22</sup>	36/M	155	Rectum	+	No	26 months/ NROM
16	Chiroque et al. <sup>23</sup>	82/M	130	Ileum	+	Yes	Not reported
17	Val-Bernal et al. <sup>24</sup>	32/M	130	Sigmoid colon	+	No	21 years/ NROM
18	Val-Bernal et al. <sup>24</sup>	61/M	30	Jejunum	+	No	2 months/ NROM
19	Nishida et al. <sup>2</sup>	65/M	255	Ileum	+	No	12 months/ NROM
20	Zhang et al. <sup>3</sup>	41/M	92	Small intestine	+	No	1 month/ NROM
21	Keser et al. <sup>7</sup>	35/M	95	Ascending colon	+	No	2 months/ NROM
22	Present case	66/M	100	Small intestine	+	No	4 months/ NROM

M, male; F, female; NROM, no recurrence or metastasis.

had a median age of 54 years (range, 26–82 years). These mesentery SFTs seem to more commonly occur in the ileum. As in our case, all cases reported in the literature were treated surgically. Based on these published reports, it is clear that extrapleural SFTs most commonly occur in adults but have a wide age distribution. SFTs are usually slowly growing and painless, with no clinical symptoms unless they compress adjacent tissue.<sup>7</sup>

CT and MRI are effective in the diagnosis of SFTs. Most tumors are round or lobulated with clear boundaries, and the mass is often large and completely enveloped.<sup>25</sup> On multi-slice CT imaging, SFTs appear as heterogeneously enhancing, multiloculated soft tissue masses. Areas of dense or scattered calcification and central tubular or rounded hypoattenuating regions representing necrosis are also observed. Enhancement is most conspicuous in the arterial and early portal venous phases with washout of contrast in the delayed phase. However, if fibrous elements are predominant, contrast enhancement becomes marked in the delayed phases as well.<sup>4</sup> Multiple peripheral blood vessels were observed in the arterial phase of the present case. This feature is thought to be an important diagnostic factor for SFTs.

SFTs exhibit a heterogeneous appearance on both T1- and T2-weighted MRI, with the appearance of the solid areas ranging from isointense to hypointense relative to skeletal muscle on all sequences. In contrast, cystic areas appear hyperintense on T2-weighted images. The contrast enhancement is similar to that seen on CT imaging.

Differential diagnoses of SFTs include other benign tumors involving the mesentery, such as desmoids, inflammatory pseudotumors, mesenteric fibromatosis, and leiomyomas. Gastrointestinal stromal tumors may be identified by the presence of extensive foci of hemorrhage and

necrosis. Malignant lesions of the mesentery that need to be excluded before achieving a diagnosis of SFTs include soft tissue sarcomas, leiomyosarcomas, lymphoma, and metastases.<sup>20</sup> The presence of rounded necrotic areas, calcifications, and the above-described enhancement pattern in the arterial, portal venous, and delayed phases aid in distinguishing between SFTs and other neoplasms arising from the mesentery.

The most effective therapeutic modality for SFTs is surgical resection. The role of other treatment modalities in the management of SFTs is unclear. Some reports in the literature have demonstrated the effectiveness of radiotherapy for the control of SFTs.<sup>26,27</sup> Chemotherapeutic drugs and novel targeted drugs seem to exert some activity on SFTs.<sup>28</sup> However, a consensus has not been achieved concerning the effectiveness of radiotherapy and chemotherapy against SFTs.

## Conclusion

Although it is difficult to make a definitive diagnosis of an SFT before surgery, CT or MRI may help to identify the tumor. Imaging techniques can be used as the first-choice methods of diagnosing this tumor and for analyzing its morphology, density, and composition. Enhancement is also essential. The primary treatment of an SFT is surgical removal of the tumor with clean margins. Long-term follow-up is necessary after surgery.

## Ethics statement

The First Hospital of Lanzhou University does not require ethical approval for reporting individual cases. Written informed consent was obtained from the patient for publication of this case report and its accompanying images.

### Declaration of conflicting interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

### Funding

The author(s) received no financial support for the research, authorship, and/or publication of this article.

### ORCID iD

Jing-Ni Liu  <https://orcid.org/0000-0002-9622-779X>

### References

1. You X, Sun X, Yang C, et al. CT diagnosis and differentiation of benign and malignant varieties of solitary fibrous tumor of the pleura. *Medicine (Baltimore)* 2017; 96: e9058.
2. Nishida K, Ubukata H, Konishi S, et al. A giant solitary fibrous tumor of the mesentery: a case report and literature review. *World J Surg Oncol* 2015; 13: 17.
3. Zhang GJ, Li RT, Zhou Y, et al. Solitary fibrous tumor of small bowel mesentery with postoperative bowel obstruction: a case report and review of literature. *Int J Clin Exp Pathol* 2015; 8: 11691–11697.
4. Balaji R, Ramachandran K and Somanathan T. A rare case of solitary fibrous tumour of the sigmoid mesocolon: imaging features and review of literature. *Cancer Imaging* 2009; 9: 67–69.
5. Bosković T, Zivojinov M, Sabo JI, et al. Rare solitary fibrous tumor of the stomach: s case report. *Vojnosanit Pregl* 2015; 72: 1035–1038.
6. Urabe M, Yamagata Y, Aikou S, et al. Solitary fibrous tumor of the greater omentum, mimicking gastrointestinal stromal tumor of the small intestine: a case report. *Int Surg* 2015; 100: 836–840.
7. Keser BN, Kirman UN, Aktemur G, et al. A rare solitary fibrous tumour of the ascending mesocolon: a case report. *Ann R Coll Surg Engl* 2019; 101: e108–e110.
8. Davanzo B, Emerson RE, Lisy M, et al. Solitary fibrous tumor. *Transl Gastroenterol Hepatol* 2018; 3: 94.
9. Pérez Cabañas I, De Miguel Velasco M, Reparaz Romero B, et al. Hemangiopericytoma of the rectal mesentery. *Rev Esp Enferm Dig* 1990; 77: 449–454.
10. Hardisson D, Limeres MA, Jimenez-Heffernan JA, et al. Solitary fibrous tumor of the mesentery. *Am J Gastroenterol* 1996; 91: 810–811.
11. Nakagawa T, Shinoda Y, Masuko Y, et al. Hemangiopericytoma of the sigmoid mesentery: report of a case with immunohistochemical findings. *Surg Today* 1997; 27: 64–67.
12. Prathima KM, Harendrakumar ML, Srikantia SH, et al. Hemangiopericytoma of mesentery: a case report. *Indian J Pathol Microbiol* 2003; 46: 69–70.
13. West NJ, Daniels IR and Allum WH. Haemangiopericytoma of the sigmoid mesentery. *Tech Coloproctol* 2004; 8: 179–181.
14. Ben Fadhel C, Ferchiou M, Nfoussi H, et al. [Solitary fibrous tumour originating in the mesentery: diagnostic and prognostic problems (a case report)]. *Tunis Med* 2008; 86: 936–937.
15. Soda H, Kainuma O, Yamamoto H, et al. Giant intrapelvic solitary fibrous tumor arising from mesorectum. *Clin J Gastroenterol* 2010; 3: 136–139.
16. Lau MI, Foo FJ, Sissons MC, et al. Solitary fibrous tumor of small bowel mesentery: a case report and review of the literature. *Tumori* 2010; 96: 1035–1039.
17. Medina-Franco H, Cabrera-Mendoza F, Almaguer-Rosales S, et al. [Mesenteric solitary fibrous tumor: a case report and literature review]. *Rev Gastroenterol Mex* 2011; 76: 186–189.
18. Bouhabel S, Leblanc G, Ferreira J, et al. Solitary fibrous tumor arising in the mesentery: a case report. *World J Surg Oncol* 2011; 9: 140.
19. Kudva R, Monappa V and Rao A. Giant solitary fibrous tumor of the mesentery: a rare case. *J Cancer Res Ther* 2011; 7: 376–378.
20. Muroli M, Mezzetti G and Noto S. Malignant solitary fibrous tumor originating

- from the mesentery. *Gastroenterology* 2012; 142: 12–13, 187–188.
21. Cantarella F, Graziosi L, Cavazzoni E, et al. Small bowel mesentery solitary fibrous tumor. A rare neoplasia in a young male. *G Chir* 2012; 33: 271–273.
  22. Nishikawa T, Takei Y, Teshima S, et al. A hypervascular malignant solitary fibrous tumor in the mesentery of the rectum with good response to preoperative radiation therapy. *Int Cancer Conf J* 2013; 2: 30–35. DOI: 10.1007/s13691-012-0059-5.
  23. Chiroque L, Arenas J and Luyo-Rivas A. [Solitary fibrous tumor confined to the small bowel (ileum) mesentery]. *Rev Gastroenterol Mex* 2013; 78: 259–260.
  24. Val-Bernal JF, Mayorga M, Fernandez F, et al. Solitary fibrous tumor arising from the mesentery of adult patients. Report of two cases and review of the literature. *Rom J Morphol Embryol* 2014; 55: 203–207.
  25. Zhang WD, Chen JY, Cao Y, et al. Computed tomography and magnetic resonance imaging findings of solitary fibrous tumors in the pelvis: correlation with histopathological findings. *Eur J Radiol* 2011; 78: 65–70.
  26. Ma L, Wang L, Fang X, et al. Diagnosis and treatment of solitary fibrous tumor/hemangiopericytoma of central nervous system. Retrospective report of 17 patients and literature review. *Neuro Endocrinol Lett* 2018; 39: 88–94.
  27. Haas RL, Walraven I, Lecointe-Artzner E, et al. Radiation therapy as sole management for solitary fibrous tumors (SFT): a retrospective study from the Global SFT Initiative in collaboration with the Sarcoma Patients EuroNet. *Int J Radiat Oncol Biol Phys* 2018; 101: 1226–1233.
  28. Stacchiotti S, Marrari A, Dei Tos AP, et al. Targeted therapies in rare sarcomas: IMT, ASPS, SFT, PEComa, and CCS. *Hematol Oncol Clin North Am* 2013; 27: 1049–1061.