

## Primary Dedifferentiated Liposarcoma of the Colon - Report of a Rare Case with Review of Literature

### Abstract

Liposarcoma is the most common malignant soft tissue tumor in adults. Extremities and retroperitoneum are the common sites of involvement of liposarcoma. Liposarcoma of the gastrointestinal tract is rare and the colon is an extremely uncommon site. Mesenchymal tumors of the bowel are mainly represented by gastrointestinal stromal tumors (GIST). A sixty-one-year-old male patient presented with abdominal pain and distension. Contrast-enhanced computerized tomography (CECT) showed a circumferentially proliferative mass lesion in the mid ascending colon causing acute colonic obstruction with multiple large enhancing exophytic mass lesions of varying sizes on the peritoneal surface of the intestine. A right hemicolectomy was done. Gross examination showed polypoidal growth of 3.5x3x1.5 cm in the luminal aspect of ascending colon and a large exophytic firm mass in the transverse colon of 15x5.5x5 cm. There were multiple smaller exophytic nodules on the serosal aspect of the intestine. Microscopy showed neoplasm composed of atypical spindle cells in ill-defined fascicles and whorls. Foci showing aggregates of adipocytes of varying sizes with occasional lipoblasts were also noted. The spindle cells were Ckit negative, DOG 1 negative, and showed positivity for SMA. Based on morphology and immunoprofile, a diagnosis of dedifferentiated liposarcoma was given. This case represents dedifferentiated liposarcoma presenting as single endophytic and multiple exophytic masses and highlights the fact that, although rare, dedifferentiated liposarcoma can present as multiple intestinal mass lesions.

**Keywords:** Dedifferentiated liposarcoma, Endophytic and exophytic mass, Gastrointestinal stromal tumors, Primary liposarcoma of the colon

### Introduction

Mesenchymal tumors are a relatively rare subset of gastrointestinal tumors and the majority are represented by gastrointestinal stromal tumors (GIST). The gastrointestinal tract is not a typical location for primary liposarcoma.<sup>[1-3]</sup> Secondary involvement from liposarcomas of retroperitoneum and extremities should always be considered and excluded before making a diagnosis of primary liposarcoma of the colon. Most cases of primary gastrointestinal liposarcomas arise in the esophagus and present as polypoid lesions. Involvement of other parts of the gastrointestinal tract is exceedingly rare with the limited number of case reports.<sup>[3-8]</sup> Primary colonic liposarcoma presenting as the intestinal obstruction is extremely rare and can mimic disseminated colon cancer or gastrointestinal stromal tumor on clinical and radiological examination.

The main histomorphological differential diagnosis of dedifferentiated liposarcoma of

the colon is a gastrointestinal stromal tumor (GIST).<sup>[2]</sup> It is crucial to make an accurate diagnosis because the correct diagnosis carries important therapeutic implications. The detection of well-differentiated liposarcoma components and immunohistochemistry will help to differentiate dedifferentiated liposarcoma from its mimics.

### Case report

A sixty-one-year-old male patient presented to the emergency department with complaints of abdominal distension, recurrent episodes of vomiting, and constipation. He also had abdominal pain and loss of appetite. He had a history of treatment for deep vein thrombosis involving the left popliteal vein 3 months back and he was on anticoagulants. The patient had no other co-morbidities. On examination, his abdomen was grossly distended with diffuse mild tenderness on palpation. Bowel sounds were absent.

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Contrast-enhanced computerized tomography (CECT) showed a circumferentially proliferative mass lesion in the mid ascending colon causing acute colonic obstruction with multiple large enhancing mass lesions of varying sizes in the peritoneal surfaces of the large and small intestine and in the omentum which was suggestive of omental and peritoneal deposits (**Figure 1**). With the clinical diagnosis of metastatic malignancy of the right colon with acute colonic obstruction, the patient underwent laparotomy. On laparotomy, there was a large exophytic nodular mass 10x 8x8 cm in the transverse colon which was involving the greater omentum, with multiple smaller nodular lesions on the serosal surfaces. There was an intraluminal constricting lesion involving ascending colon with proximal bowel dilatation. Given the findings, a right hemicolectomy with complete omentectomy was done.



**Figure 1.** CT scan showing multiple nodular heterogeneous lesions with solid and fatty components in the bowel wall and mesentery.

Right hemicolectomy specimen measured 66 cm length- colon measuring 36 cm, ileum measuring 30 cm, and appendix measuring 5 cm. The serosal aspect of the transverse colon showed a large firm exophytic mass measuring 15x5.5x5 cm, a cut section of which was yellowish with admixed whitish whorled areas. The luminal aspect of ascending colon showed polypoidal growth measuring 3.5x3x1.5 cm with a grey-white firm cut surface. Multiple nodules were noted on the serosal aspect of the intestine, the largest two measurements 6x4.5x3.5 cm and 3.5x3x2 cm (**Figure 2**).



a)



b)

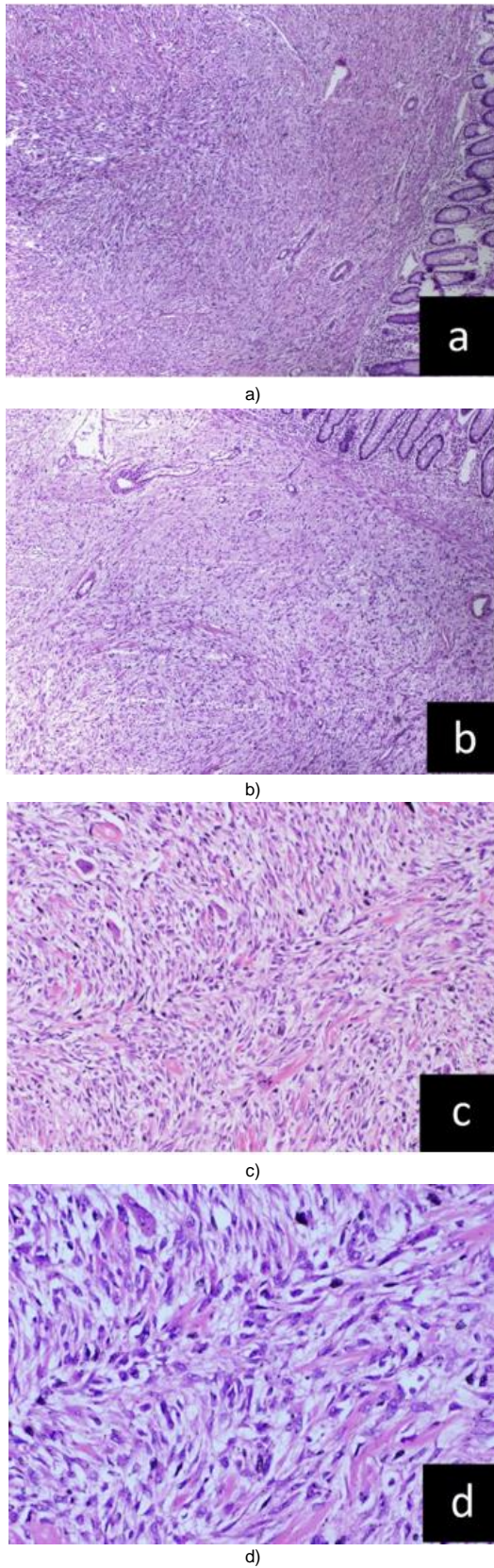


c)

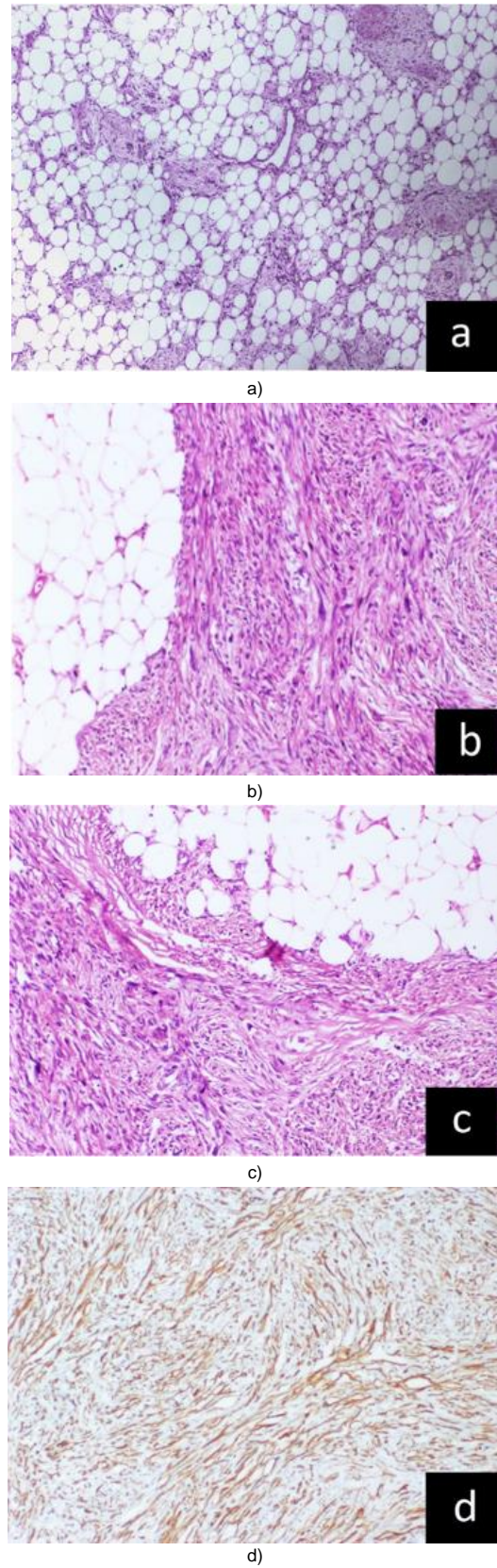
**Figure 2.** a, b) Multiple grey-white to yellowish nodular lesions-exophytic and endophytic, c) largest showing grey-white to yellowish cut surface, a firm with whorled areas.

Microscopic examination of the largest growth showed neoplasm composed of spindle cells in ill-defined fascicles and whorls. In areas, adipocytes of varying sizes were seen with occasional lipoblasts. The spindle cells showed a moderate amount of cytoplasm, ovoid/spindly nuclei, and moderate anisonucleosis. These spindle cells were admixed with scattered large cells with bizarre nuclei and prominent nucleoli. Occasional multinucleated cells were also seen. Mitosis 3-4/10 HPF noted. There were areas of necrosis, collections of lymphoplasmacytic cells, and giant cells. The tumor was involving muscularis propria of the colon. Sections from polypoidal mass in the ascending colon also showed a similar morphological appearance and neoplastic cells were involving the lamina propria. Sections from the yellowish serosal nodules showed predominantly atypical adipocytes with hyperchromatic nuclei and scattered univacuolated and multivacuolated lipoblasts intervened by variably cellular spindle cell areas, with focal myxoid background (**Figures 3 and 4**).





**Figure 3.** a) Tumour involving submucosa of the large intestine (H&E, X50), b) Tumour involving lamina propria (H&E, X50), c, d) Higher power of the dedifferentiated component showing spindle-shaped tumor cells arranged in fascicles admixed with scattered larger, irregular neoplastic cells (H&E, X200)



**Figure 4.** a) Well-differentiated liposarcoma showing variably sized adipocytes with few scattered large atypical cells exhibiting hyperchromatic nuclei (H&E, X100), b, c) Interface between dedifferentiated and well-differentiated liposarcoma (H&E, X200), d) Tumour cells showing SMA positivity (H&E, X200).

Tumor cells were negative for Ckit and DOG1. The spindle cells were SMA (Smooth muscle actin) positive and S100 negative. Scattered cells showed desmin positivity and were myogenin negative.

Diagnosis of multifocal dedifferentiated liposarcoma was given.

After a multi-disciplinary tumor board discussion, the patient was offered ifosfamide-based chemotherapy. Now he is clinically better and on his second cycle of chemotherapy.

## Results and Discussion

Deep soft tissue of proximal extremities and trunk are the common locations of liposarcoma. Retroperitoneum and paratesticular area can also get involved. Head and neck region, mediastinum, and distal extremities can rarely be involved.

Liposarcomas are divided into atypical lipomatous tumor/well-differentiated liposarcoma, dedifferentiated liposarcoma, myxoid liposarcoma, pleomorphic liposarcoma and myxoid pleomorphic sarcoma.<sup>[1]</sup>

Dedifferentiated liposarcoma (DDL) is an atypical lipomatous tumor / well-differentiated liposarcoma (ALT/WDL) showing progression to sarcoma of variable histological grade.

MDM2 and CDK4 positivity by immunohistochemistry, and amplification of MDM2 by FISH are the characteristic features of both the entities. Dedifferentiation can occur in the initial presentation or recurrence. Dedifferentiation risk is higher for deep-seated lesions.<sup>[1]</sup>

Liposarcoma primarily involving the gastrointestinal tract is unusual. As the colon is an extremely rare site of liposarcoma, the possibility of an intraabdominal liposarcoma with secondary involvement of the colon should always be considered and excluded before making the diagnosis of primary liposarcoma of the colon. In 1989, Wood and Morgenstern reported the first case of primary colonic liposarcoma.<sup>[9]</sup>

Symptoms of primary colonic liposarcomas depend on the location of the mass. The endoluminal masses present with features of obstruction. Exophytic masses can present as abdominal pain or swelling.<sup>[3-8]</sup> In our case, both endoluminal and exophytic lesions were present.

The transition from ALT/WDPS to non-lipogenic sarcoma is the characteristic histology finding in dedifferentiated liposarcoma. The transition is usually abrupt and the extent of dedifferentiation is variable. Dedifferentiated areas exhibit a wide morphologic spectrum, most frequently showing high-grade morphology resembling undifferentiated pleomorphic sarcoma or intermediate- to high-grade myxofibrosarcoma. Case of low-grade dedifferentiation show uniform spindle cells with mild nuclear atypia. Heterologous differentiation is seen in about 5-10% of dedifferentiated liposarcoma. Myogenic, osteosarcomatous, chondrosarcomatous and angiosarcomatous differentiation have been reported.<sup>[1]</sup>

A literature search showed only a few cases of colonic liposarcoma, mainly single case reports. The majority of the reported cases were solitary lesions and the occurrence of multiple lesions was very rare. The age of patients ranged from 32 years to 84 years. A slight female predominance was noted. The size of the lesion varied from 3.5 cm to 23 cm. Well-differentiated liposarcoma was the predominant histology, with occasional cases of myxoid, pleomorphic, and dedifferentiated liposarcomas (Table 1).

**Table 1. Previously reported cases of liposarcoma large intestine**

| Author                                     | Year | Age/ Sex | Site             | Size (cm) | Histologic type                       |
|--|------|----------|------------------|-----------|---------------------------------------|
| Wood DL <i>et al.</i> <sup>[9]</sup>       | 1989 | 62/F     | Ileocecal valve  | 12        | Myxoid                                |
| Parks RW <i>et al.</i> <sup>[10]</sup>     | 1994 | 54/F     | Ascending colon  | 6         | Pleomorphic                           |
| Magro <i>et al.</i> <sup>[11]</sup>        | 2000 | 65/F     | Caecum           | 5         | Well differentiated                   |
| Chen KT <sup>[12]</sup>                    | 2004 | 52/F     | Descending colon | 7.5       | Well differentiated                   |
| Gutsu E <i>et al.</i> <sup>[13]</sup>      | 2006 | 46/M     | Ascending colon  | 12        | Myxoid                                |
| Shahidzadeh <i>et al.</i> <sup>[14]</sup>  | 2007 | 56/F     | Hepatic flexure  | 3.5       | Well-differentiated                   |
| Chaudhary A <i>et al.</i> <sup>[15]</sup>  | 2007 | 66/F     | Descending colon | 4.5       | Well-differentiated                   |
| Jarboui S <i>et al.</i> <sup>[16]</sup>    | 2009 | 69/M     | Descending colon | 7         | Dedifferentiated                      |
| D'Annibale M <i>et al.</i> <sup>[17]</sup> | 2009 | 79/F     | Transverse colon | 5.2       | Pleomorphic                           |
| Choi YY <i>et al.</i> <sup>[18]</sup>      | 2010 | 41/M     | Ascending colon  | 20        | Mixed                                 |
| Türkoğlu MA <i>et al.</i> <sup>[19]</sup>  | 2014 | 71/F     | Transverse colon | 23        | Dedifferentiated                      |
| Kito Y <i>et al.</i> <sup>[20]</sup>       | 2014 | 84/F     | Ascending colon  | 10        | Dedifferentiated                      |
| Rudnicki C <i>et al.</i> <sup>[21]</sup>   | 2015 | 34/M     | Sigmoid colon    | 4         | Well differentiated                   |
| Fernandes SR <i>et al.</i> <sup>[22]</sup> | 2016 | 32/F     | Sigmoid colon    | 3.5       | Well differentiated                   |
| Chou CK <i>et al.</i> <sup>[23]</sup>      | 2016 | 62/M     | Ascending colon  | 14        | Myxoid                                |
| Sawayama H <i>et al.</i> <sup>[4]</sup>    | 2017 | 52/F     | Ascending colon  | 6.5       | Well differentiated/ Dedifferentiated |



|                              |      |      |                                   |               |                               |
|------------------------------|------|------|-----------------------------------|---------------|-------------------------------|
| Hollowoa B <i>et al.</i> [5] | 2018 | 64/M | Hepatic flexure                   | 11.8          | Dedifferentiated              |
| Sultania M <i>et al.</i> [6] | 2019 | 57/F | Ascending colon                   | 22.5 multiple | Well-differentiated and mixed |
| Guadagno <i>et al.</i> [7]   | 2019 | 53/M | Hepatic flexure                   | 4             | Dedifferentiated              |
| Serafini <i>et al.</i> [8]   | 2020 | 75/M | Descending colon                  | 8             | Dedifferentiated              |
| Gajzer <i>et al.</i> [3]     | 2020 | 81/F | colon                             | 8.8           | Well differentiated           |
| Gajzer <i>et al.</i> [3]     | 2020 | 74/F | caecum                            | NA            | Dedifferentiated              |
| Current case                 | 2021 | 61/M | Transverse colon, ascending colon | 15 multiple   | Dedifferentiated              |

The main histological differential diagnosis of well-differentiated liposarcoma of the gastrointestinal tract is a lipoma. Adipocytes of variable sizes and atypical cells with large hyperchromatic nuclei suggest the diagnosis of well-differentiated liposarcoma.<sup>[1, 2]</sup> MDM2 and CDK4 positivity by IHC or MDM2 amplification by FISH will also help in the diagnosis.

Gastrointestinal stromal tumor (GIST) is the main differential diagnosis of dedifferentiated liposarcoma of the gastrointestinal tract. The distinction between the two entities is extremely important as tyrosine kinase inhibitors are used in the treatment of GIST. The diagnosis of dedifferentiated liposarcoma depends on identification of a well-differentiated component, demonstration of MDM2 and CDK4 positivity by IHC or MDM2 amplification by FISH. Immunoreactivity with CD117 and DOG1 will confirm the diagnosis of GIST. It is also important to note that some dedifferentiated liposarcoma may show focal weak staining for CD117. Another point to note is that nuclear pleomorphism is commonly seen in dedifferentiated liposarcoma and is rare in GIST. Differential diagnoses of dedifferentiated liposarcoma also include leiomyosarcoma, pleomorphic sarcoma, malignant peripheral nerve sheath tumor, and lipomatous solitary fibrous tumor.<sup>[2, 3]</sup>

The distinction between dedifferentiated liposarcoma and sarcoma infiltrating fat can be difficult. In this scenario, the presence of the atypical lipomatous tumor/well-differentiated liposarcoma component will help to diagnose dedifferentiated liposarcoma.

Because of the extreme rarity of primary colonic liposarcoma, there are no standardized guidelines for the treatment. Complete surgical excision with negative margins is considered the gold standard. The main prognostic factors include tumor size, histologic subtype, and extent of the tumor. Dedifferentiation in liposarcoma is associated with a poor clinical prognosis.<sup>[3, 5-8]</sup>

## Conclusion

Primary colonic liposarcoma is rare, with only a few cases reported in the literature. Still rarer is the dedifferentiated liposarcoma colon. The presence of multiple lesions is extremely uncommon. The present case raises awareness that dedifferentiated liposarcoma should be also be considered in

the histologic differential diagnosis for any spindle cell tumor of the retroperitoneum or intra-abdominal visceral organs.

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## Conflict of interest

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## Ethics statement

None.

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