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Case Report

Computed tomography identification of an exophytic colonic liposarcoma

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ABSTRACT

It may be difficult to ascertain the relationship between a large intra-abdominal tumor and the adjacent organs if they are close together. In the current case, a definitive preoperative diagnosis of an exophytic colonic tumor was obtained by the demonstration of obtuse angles between the tumor and colon and by distinct recognition of the mucosa-submucosa of the colonic wall on computed tomography; the accuracy of this preoperative diagnosis was subsequently confirmed by pathologic findings.

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Introduction

Liposarcoma is the most common type of soft-tissue sarcoma. It usually occurs in the retroperitoneum and then in the extremities. However, it rarely involves the gastrointestinal tract. In the colon [1–12], it may originate in the submucosa as an intraluminal tumor or in the subserosa as an exophytic mass. In the current case, we present 2 computed tomography (CT) manifestations useful in ascertaining the exophytic nature of the tumor's colon origin: (1) obtuse angles between the tumor and colon and (2) identification of the normal mucosa and submucosa of the colonic wall.

Case report

A 62-year-old male patient presented to the surgical department with the complaint of a palpable mass in the right lower abdomen, which he had been aware of for 2 weeks. He denied having experienced local pain or tenderness, tarry or bloody stool, tenesmus or constipation. The patient received a CT examination that showed a homogeneous soft-tissue tumor, about 14 × 13 × 9 cm in size and abutting the anterior surface of the ascending colon on precontrast scans (Fig. 1). The angles between the tumor and the colon were obtuse, an appearance suggestive of a colonic origin of the

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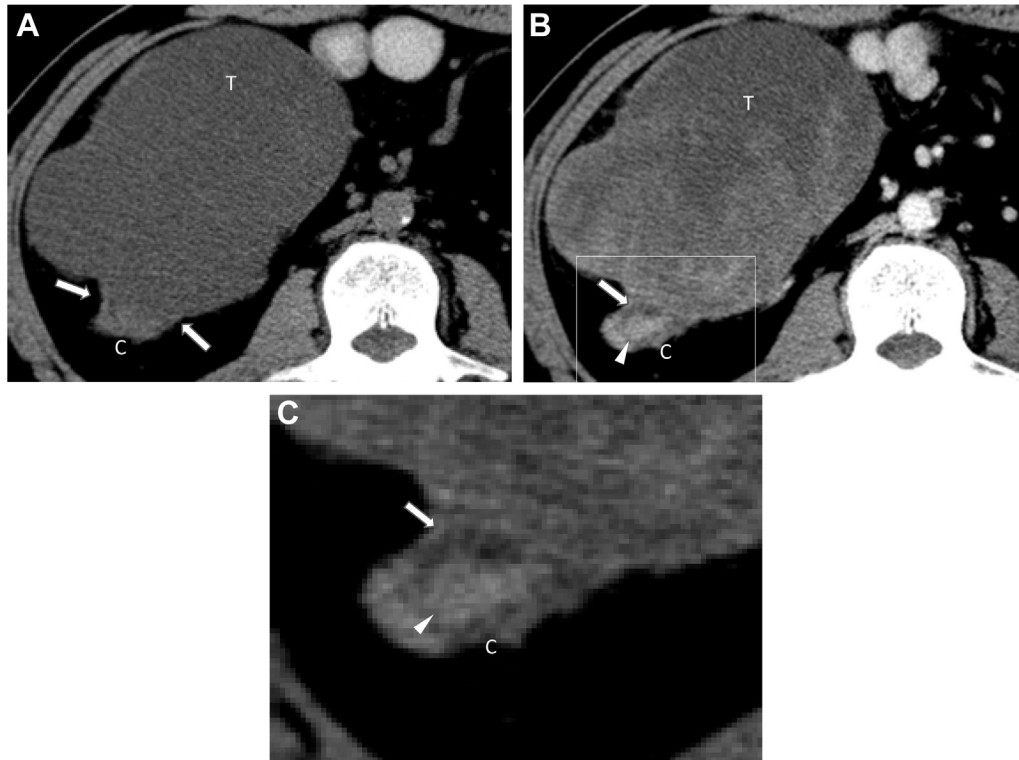


Fig. 1 – (A) Precontrast axial image. A homogeneous soft-tissue tumor (T) was abutting on anterior surface of the ascending colon (C). An obtuse angle (arrows) was noted in both sides between the tumor and colon. This appearance suggested that the tumor was growing out from the colon, instead of compressing from outside toward the colon. (B) Postcontrast axial image. The tumor (T) was heterogeneously enhanced. The submucosa (arrow) was distinct between the inner mucosa (arrowhead) and outer muscularis propria and tumor. This differentiation excluded the possibility of an intraluminal tumor. (C) A magnified view of the rectangle in (B). Arrow, submucosa; arrowhead, mucosa.

tumor. No fat-density tissue was found. An intravenous contrast medium injection showed a heterogeneous enhancement of the tumor. The hypodense parts, not obviously enhanced, had a density of about 15-20 HUs. The fat-density submucosa was readily distinguished between the tumor and the inner mucosa (Figs. 1 and 2). This differentiation indicated that the tumor was most likely originating from a layer beneath the submucosa. The inhomogeneous texture was interpreted to be due to different tumor components and necrosis. The patient was admitted for further treatment. A subsequent colonoscopic examination revealed an external compression of the ascending colon without mucosal lesion or tumor. Based on a preoperative CT diagnosis of a gastrointestinal stromal tumor (GIST) of the ascending colon, the patient received a right hemicolectomy. The gross specimen showed an exophytic soft solid tumor with a myxoid to gelatinous consistency (Fig. 3). The microscopic examination revealed a myxoid liposarcoma in the subserosa with focal penetration through the serosa of the colon. The muscular layer was not invaded. The patient recovered uneventfully and was discharged 10 days later. Despite receiving adjuvant chemotherapy, the patient ultimately succumbed to a widespread intra-abdominal metastasis 14 months later.

Discussion

Primary liposarcoma very rarely occurs in the colon. The reported CT appearance of liposarcoma of the colon included an intra-abdominal fatty-tissue mass [3], a slightly enhanced solid mass with a cystic lesion located in the ascending colon [8], and a large macrolobulated peripherally enhanced mass without radiologic hint of colonic invasion or obstruction [9]. The tumor locations of these 3 cases were all in the subserosa, and none showed CT evidence of colon obstruction. The difficulty in determining the tumor origin may have been because the tumors were closely adhered to the colon. It might have easily been thought to be an intra-abdominal tumor adjacent to the colon. However, in the present case, 2 CT manifestations strongly suggested the possibility of an exophytic tumor originating from a layer beneath the mucosa of the colon. Obtuse angles between the colon and the tumor, which implied an intrinsic tumor bulging outward from the colonic wall instead of an extrinsic tumor compressing inward, were the first CT manifestation. This appearance is similar to an obtuse angle between an extrapulmonary mass and the lung parenchyma [13]. When an extrapulmonary mass bulges toward the lung parenchyma, the pleura is lifted

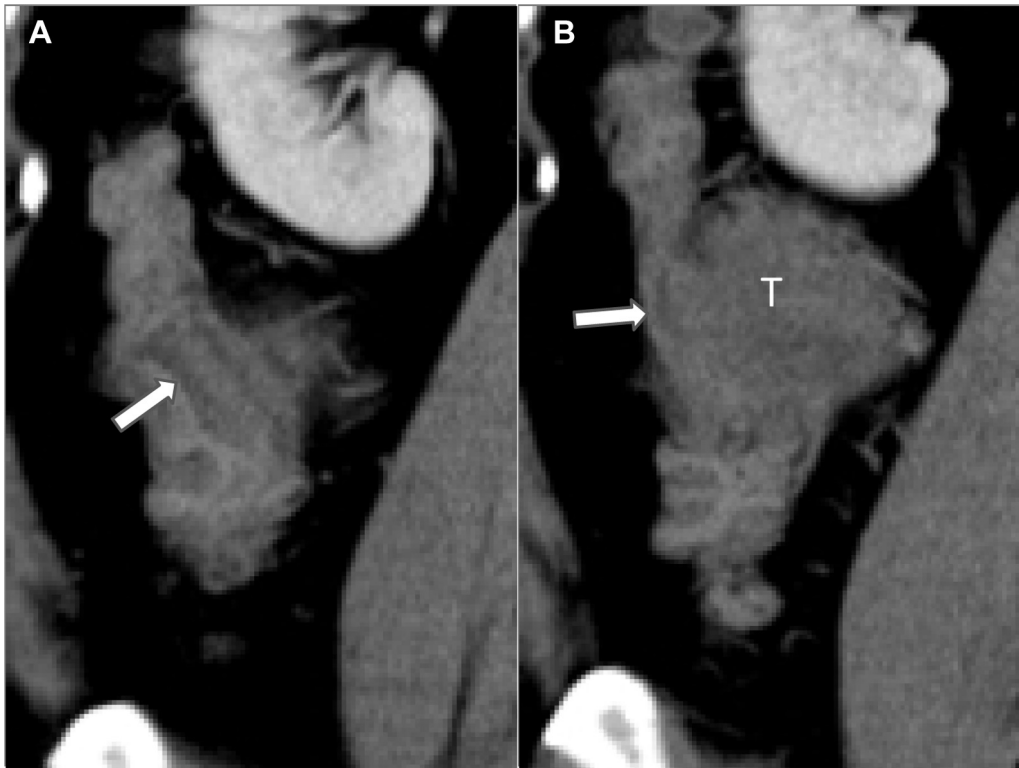


Fig. 2 – (A, B) Postcontrast 2 contiguous reformatted coronal images showed that the submucosa (arrow) was closely contact to the tumor (T).

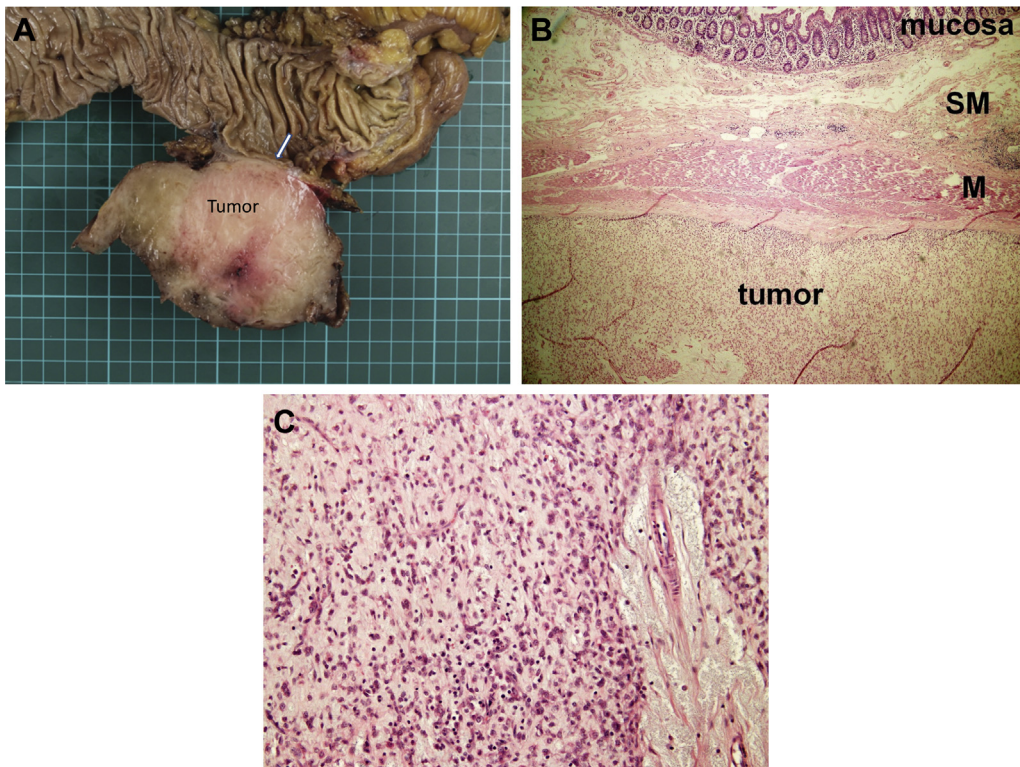


Fig. 3 – (A) The gross specimen showed an exophytic tumor arising beneath the intact mucosa (arrow). (B) A 40 \times microscopic picture. The tumor originated in subserosa without invasion to muscularis propria (M). (C) A 200 \times microscopic picture. The tumor cells had round nuclei and clear cytoplasm with vacuoles arranged in diffuse sheets. The background is loose (myxoid) with scattered thin-walled vessels. SM, submucosa.

and forms a smooth and obtuse angle. In contrast, a pulmonary mass forms an acute angle between the mass and pleura when it contacts the pleura. Similarly, the outermost colonic serosa forms a smooth and obtuse angle between the exophytic tumor and the colonic wall. If an external tumor compresses the colon, the contact site will assume an acute angle. The second manifestation was the evidently normal mucosa and submucosa, which excluded the possibility of an intraluminal tumor arising from the mucosa or submucosa. A mucosal or submucosal tumor tends to grow into the lumen and results in luminal obstruction if it is large enough. The pathologic examination confirmed that the tumor originated in the subserosa. The tumors in the current and aforementioned 3 cases [3,8,9] were large, at least 12 cm, without causing colonic obstruction. In contrast to the exophytic colonic liposarcoma arising in the subserosa, there were 7 reported cases of another rare intraluminal liposarcoma of the colon that originated in the submucosa with or without focal invasion to the muscularis propria and subserosa [1,2,4–7,10]. These cases had the largest tumor size of 7 cm, except a peduncular one that was 10-cm long [10]. They resulted in various degrees of colonic lumen obliteration.

The differential diagnoses of an exophytic colonic tumor included GIST and lymphoma. Because both GIST and lymphoma may appear homogeneous on precontrast images and show heterogeneous enhancement [14–16], it was difficult to distinguish a liposarcoma from the other 2 entities in the absence of fat-density tissue.

Liposarcoma is classified into 5 subtypes: well differentiated, dedifferentiated, myxoid, pleomorphic, and mixed type [17]. There are 11 reported cases of colonic liposarcoma, including the present one (Table 1), describing the anatomic location of the tumor in the colonic wall. Four cases originated in the subserosa, including 2 of the myxoid type and one each of the mixed and dedifferentiated types. The other 7 cases originated in the submucosa, including 3 well differentiated, 2 pleomorphic, and 2 dedifferentiated types. It seemed that the myxoid type tended to occur in the subserosa and the well-differentiated type in the submucosa. Because of the limited number of cases, it is difficult to be sure whether this predilection is true.

Surgical removal of the primary liposarcoma remains the first choice of treatment. Radiation therapy may prevent local recurrence in the surgical site. The role of chemotherapy is still controversial.

In conclusion, the true origin of an exophytic tumor arising in the subserosa of the colonic wall may be easily ignored and

misinterpreted as an intra-abdominal tumor adjacent to the colon. However, it can be confirmed by CT demonstration of obtuse angles between the tumor and colon and by the distinct recognition of mucosa-submucosa. Even though the subserosal liposarcoma was much larger than the submucosal ones, it did not cause a colon obstruction like the latter which usually resulted in various degrees of luminal obstruction. It seemed that the liposarcoma of the myxoid subtype tended to occur in the subserosa, whereas the well-differentiated subtype occurred in the submucosa (Table 1). More cases are needed to determine whether this finding and phenomenon are consistent in most of such cases.

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Table 1 – Locations and subtypes of reported colonic liposarcoma.

Chen et al., 2004 [2]	Submucosa	Well differentiated
Shahidzadeh et al., 2007 [4]	Submucosa	Well differentiated
Chaudhary et al., 2007 [5]	Submucosa	Well differentiated
D'Annibale et al., 2009 [6]	Submucosa	Pleomorphic
Parks et al., 1994 [1]	Submucosa	Pleomorphic
Kito et al., 2014 [10]	Submucosa	Dedifferentiated
Jarboui et al., 2009 [7]	Submucosa	Dedifferentiated
Choi et al., 2010 [8]	Subserosa	Mixed
Türkoğlu et al., 2014 [9]	Subserosa	Dedifferentiated
Gutsu et al., 2006 [3]	Subserosa	Myxoid
Present case	Subserosa	Myxoid