

A Mesenteric Desmoid Tumor with Rapid Progression

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Abstract

We herein report the case of a rapidly progressive sporadic mesenteric desmoid tumor (DT). A 62-year-old woman presented with a 4-cm-diameter palpable mass in the left supraumbilical area. The mass showed an ill-defined margin with heterogeneous delayed enhancement on computed tomography and heterogeneous high intensity on T2-weighted magnetic resonance imaging. Sixteen months after the initial observation, the mass had grown in size, reaching 13 cm in diameter. The resected mass was histologically confirmed as a DT of the mesentery. Since DT often has an unpredictable clinical course, clinicians should bear in mind the need for imaging follow-up.

Key words: desmoid tumor, mesentery, etodolac

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Introduction

Desmoid tumors (DTs), also called desmoid-type fibromatosis, are a benign tumor originating from the proliferation of well-differentiated fibroblasts. In the general population, DTs are rare, with an estimated incidence of 2-4 per million per year, and account for 0.03% of all neoplasms (1, 2). Although their etiology remains poorly defined, genetic (germline mutations of the adenomatous polyposis coli gene in familial adenomatous polyposis [FAP]), hormonal (estrogen), and physical (previous trauma or surgery) factors are known to be associated with their development (3). DTs can arise at various sites, including the extremities, trunk, and abdomen. The incidence of intra-abdominal DTs, which are frequently associated with the intestinal mesentery, differs between sporadic and FAP-related cases. Only 5% of sporadic DTs are intra-abdominal DTs, whereas 80% of cases of FAP-related DT are intra-abdominal. The natural history of DTs remains poorly understood, ranging from prolonged periods of stability or even spontaneous regression to periods of slow or rapid progression (4). We herein present a case of rapidly progressive mesenteric DT.

Case Report

A 62-year-old Japanese woman had been followed since 2008 for asymptomatic cholelithiasis. In March 2010, a physical examination revealed a palpable mass in the left supraumbilical area, which was firm and fixed with slight tenderness. Serum levels of γ -glutamyl transpeptidase and total cholesterol were slightly elevated. Other laboratory findings, including carbohydrate antigen 19-9, carcinoembryonic antigen, and soluble interleukin-2 receptor levels, were within normal limits. An abdominal dynamic computed tomography (CT) scan showed a 4-cm-diameter, partially ill-defined mass with delayed enhancement in the mesentery near the third portion of the duodenum (Fig. 1A). Magnetic resonance imaging (MRI) revealed the mass to be hypointense on T1-weighted imaging (T1WI) and heterogeneous with high intensity on T2-weighted imaging (T2WI) (Fig. 1B). Single-balloon endoscopy showed no evidence of the tumor being exposed to the wall of the small intestine; hence, biopsy was not possible. It was suspected to be a small intestinal mesenteric panniculitis, gastro-intestinal stromal tumor, or DT, and the patient was followed up by CT or MRI at approximately four-month intervals. However, the tumor re-

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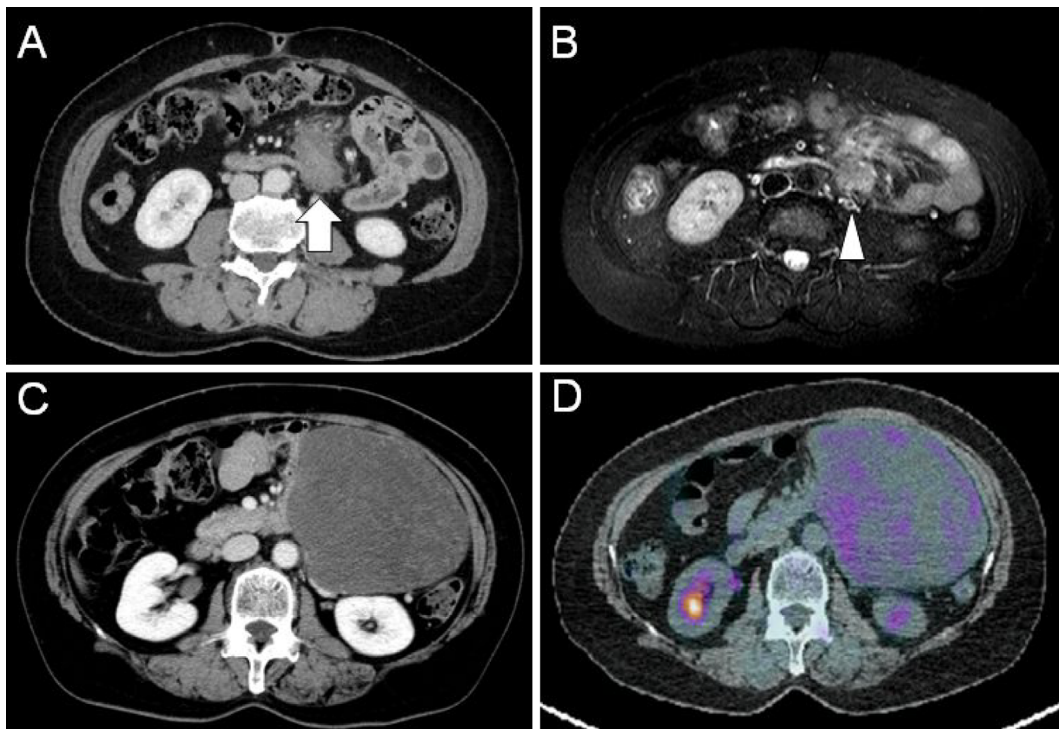


Figure 1. (A) Abdominal dynamic computed tomography (CT) shows a 4-cm-diameter mass in the mesentery near the third portion of the duodenum and ligament of Treitz at the initial observation (arrow). (B) Magnetic resonance imaging shows the mass to be heterogeneous with high signal intensity on T2-weighted imaging at the initial observation (arrowhead). (C) Abdominal dynamic CT shows the mass to have grown in size to a diameter of 13 cm at 16 months after the initial observation. (D) ^{18}F -fluorodeoxyglucose-positron emission tomography/computed tomography (FDG-PET/CT) shows moderate and heterogeneous ^{18}F -FDG uptake by the mass.



Figure 2. The tumor, measuring 14.7 cm in the greatest dimension, is rounded in shape. The mesenteric margin is ill-defined (arrows).

mained unchanged in size.

The patient complained of left flank pain 16 months later. CT showed that the mass had increased in size and was now 13 cm in diameter (Fig. 1C). ^{18}F -fluorodeoxyglucose-positron emission tomography/computed tomography (FDG-PET/CT) revealed moderate and heterogeneous ^{18}F -FDG uptake by the mass (Fig. 1D). The patient underwent mass resection with partial resection of the duodenum and jejunum.

The tumor, measuring 14.7×11.6×9.8 cm in diameter, was rounded in shape and appeared yellowish-white in cross-

section. The mesenteric margin was ill-defined (Fig. 2). There was no evidence of the tumor being exposed to the wall of the gastrointestinal tract. A histological examination revealed that the tumor was mainly composed of spindle-shaped cells with a fibrous and myxoid stroma (Fig. 3A), partially infiltrating the muscularis propria and subserosa of the small bowel (Fig. 3B). The microscopic margin was positive. There was a low-to-moderate percentage of spindle cells with nuclear atypia, and the percentage of mitotic figures was low (0-1/50 high power fields). Immunohistochemistry showed that the tumor cells were positive for β -catenin and platelet-derived growth factor (PDGFR)- β , but negative for c-Kit and CD34 (Fig. 3C). On the basis of these results, the tumor was diagnosed as a DT of the mesentery. The patient had no history of administration of exogenous estrogen, abdominal surgery, or trauma. Colonoscopy revealed no polyposis. The patient has been taking etodolac, a nonsteroidal anti-inflammatory drug (NSAID), as adjuvant therapy for three years. A follow-up at four years post-surgery showed her to be in good health and without recurrence.

Discussion

DT is a rare entity with a highly variable and unpredictable clinical course. Several retrospective studies have reported the clinical course of DTs. Church reported rapid

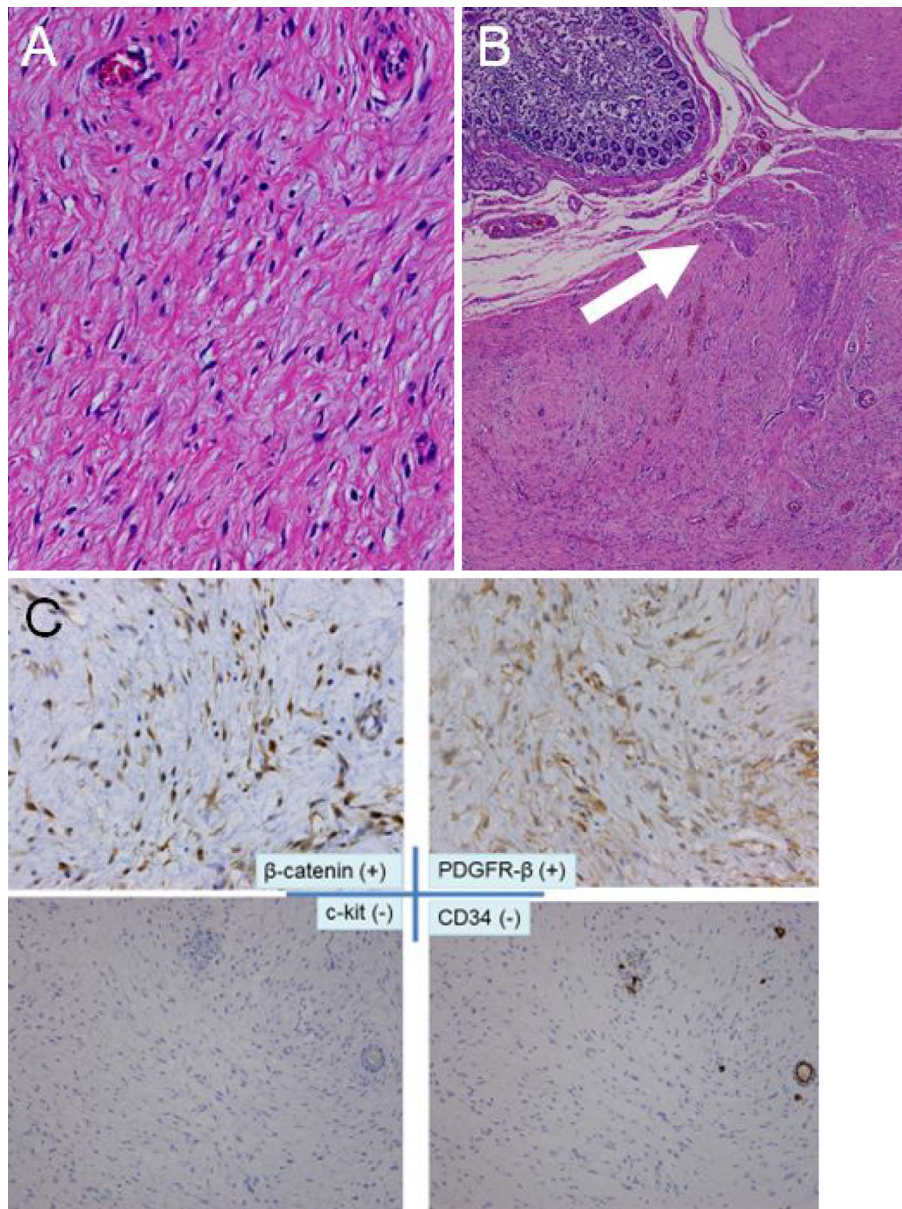


Figure 3. Sections stained with hematoxylin and eosin show that the tumor is mainly composed of spindle-shaped cells with a fibrous and myxoid stroma (A), partially infiltrating the muscularis propria and subserosa of the small bowel (arrow) (B). (C) The tumor cells appear immunohistochemically positive for β -catenin and platelet-derived growth factor (PDGFR) - β , but negative for c-Kit and CD34. Original magnification, $\times 40$ (A and C) and $\times 4$ (B).

growth of DT in 10% of his cohort in the US (5), while Koh et al. reported aggressive growth of DTs in 13% of their cohort in Singapore (6). Another study demonstrated that the majority of cases (89%) of progression of DT occurred within the first 2 years of the observation period (7). In the present patient, the DT grew rapidly 16 months after the initial observation.

Previous studies have investigated the accuracy of imaging modalities in predicting the behavior of DTs. DTs have a variable appearance on CT and MRI, which reflects the relative abundance of collagenous or myxoid stroma (8). Lesions with a highly collagenous stroma appear homogeneous and show soft-tissue attenuation, whereas those with a myxoid stroma appear hypoattenuated on CT. Some reports

have demonstrated the usefulness of T2WI MRI in the assessment of the behavior of DTs. Hypercellular DTs with abundant collagen have been reported to show high signal intensity on T2WI (9). Healy et al. found that rapidly growing DTs show high signal intensity on T2WI (10). In their study, 8 of 35 DTs showed high signal intensity on T2WI; all of these tumors showed significant growth (defined as at least a doubling of the cross-sectional area) during the follow-up period. A recent study showed that, among the radiologic findings on CT and MRI, a partially ill-defined margin was an independent predictor of recurrence or progression of the DT (11). In accordance with these findings, our patient had a DT with a partially ill-defined margin and high intensity on MRI T2WI and showed rapid growth of

the tumor within 2 years after the initial observation. Our experience suggests that DT patients with the above radiologic findings should be followed closely for at least 2 years after the initial observation.

A promising biomarker for predicting the behavior of DTs is under investigation. A *CTNNB1* (the gene encoding β -catenin) 45F mutation, low-intensity β -catenin nuclear staining, and increased midkine expression are significantly correlated with increased recurrence in cases of sporadic DT (12, 13). Recently, a prognostic gene expression signature composed of 36 genes that can predict progression-free survival in DT has been established (14). In the future, patients with these high-risk conditions may especially benefit from adjuvant therapeutic approaches.

There has been increasing evidence of the efficacy of NSAIDs in the treatment of DT (15-17). The present patient took etodolac for adjuvant therapy for three years after surgery, and remains free of recurrence four years after surgery. However, details regarding the efficacy or recommended treatment duration of this agent as adjuvant therapy in patients with DTs remain unclear. Large prospective studies are needed to determine the utility and optimal duration of adjuvant treatment with etodolac in patients with DTs.

In conclusion, we herein presented a case of rapidly progressive sporadic mesenteric DT. Our experience provides insight into the natural history of the disease. This case suggests that radiologic findings such as partially ill-defined margins and high signal intensity on MRI T2WI at the initial observation may be indicative of the presence of rapidly progressive DT.

The authors state that they have no Conflict of Interest (COI).

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