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Palliative Resection of a Giant Mesenteric Desmoid Tumor

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Background: Desmoid tumors are relatively uncommon tumors, and those occurring sporadically and in an intraabdominal location are especially rare. Although desmoid tumors have a benign histologic appearance and lack the ability to metastasize, they can invade locally, often aggressively, grow to large sizes, and recur repeatedly.

Case Report: We present the case of a symptomatic, giant mesenteric desmoid tumor discovered incidentally during workup for the patient's previous history of lung cancer. The patient elected to undergo palliative resection of the tumor because of persistent and unrelenting abdominal pain.

Conclusion: Because of the rarity of the disease, no clear evidence-based guidelines exist for the treatment of sporadic mesenteric desmoid tumors. Review of the available literature suggests that surgical resection with negative margins is a reasonable approach for patients with symptomatic tumors.

Keywords: *Adenomatous polyposis coli, fibromatosis–abdominal, mesentery, neoplasms–fibrous tissue*

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INTRODUCTION

Desmoid tumors are one of the rarest tumors worldwide, with an estimated yearly incidence of 2-4 new cases per million people.[1] Although desmoid tumors have a benign histologic appearance and lack the ability to metastasize, they can invade locally, often aggressively, grow to large sizes, and recur repeatedly. We present the case of a patient with a symptomatic, giant mesenteric desmoid tumor.

CASE REPORT

The patient was a 71-year-old male with multiple medical problems: type 2 diabetes mellitus, hypertension, hyperlipidemia, benign prostatic hypertrophy, hepatitis C, and a history of non-Hodgkin lymphoma treated and in remission for 10 years. He also had cerebral aneurysmal disease status post craniotomy with left cerebral artery aneurysm clipping 20 years prior that was further complicated by a right frontoparietal hemorrhagic stroke 5 years prior with mild residual left-sided weakness. He sought medical attention in March 2014 at an outside hospital for back pain. On diagnostic workup, he was found to have compression fractures along the 7th-9th thoracic vertebral bodies and a large mass in the right lung. Computed tomography (CT)-guided biopsy of the lung mass was consistent with moderately differentiated squamous cell cancer. The patient was incidentally found to have a 10 cm right-sided abdominal mass on a staging CT scan of his abdomen. A core needle biopsy of the abdominal mass revealed a low-grade spindle cell lesion with atypia, consistent with desmoid-type fibromatosis. The patient underwent definitive treatment of his lung cancer, but no further treatment was pursued for the abdominal mass because it was asymptomatic and of secondary priority relative to his newly diagnosed lung cancer.

The patient presented to the emergency department in July 2014 with concerns of persistent and severe left-sided abdominal pain. A CT scan of the abdomen and pelvis revealed a 13.4 $\times$ 14.6 cm eccentric heterogeneous solid mass occupying the entire left hemiabdomen (Figure 1). The origin of the mass within the abdomen was unclear. Evidence of metastatic lung cancer was also present; the patient had enlarging, invasive pleural and chest wall masses in the right hemithorax with a malignant pleural effusion and bilateral adrenal nodules. Another CT-guided core needle biopsy was performed, and the final pathology was again consistent with a low-grade spindle cell neoplasm with myxoid changes. No surgical treatment was offered because the patient's abdominal pain improved and he contracted a *Clostridium difficile* infection for which he was treated and discharged.

In September 2014, the patient sought outpatient surgical evaluation because of unrelenting left-sided abdominal pain despite persistent use of narcotic pain medication. On examination, he had left-sided abdominal tenderness with a palpable mass estimated to be larger than 20 $\times$ 20 cm and encompassing the entire left side of the abdomen. We discussed treatment options with the patient including chemotherapy, radiation, and resection. We felt that chemotherapy and/or radiation would be unlikely to shrink

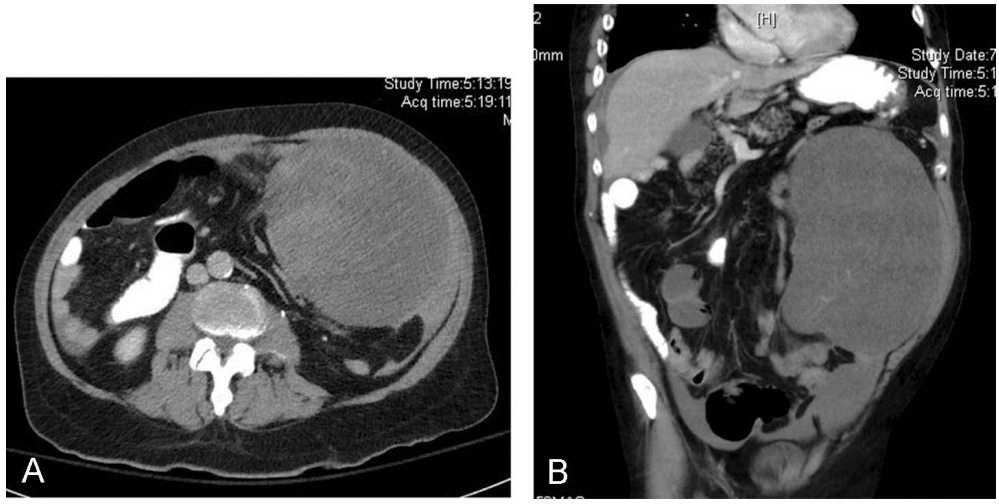

Figure 1. Representative (A) axial and (B) coronal computed tomography scan images with oral and intravenous contrast demonstrate a 13.4 × 14.6 cm eccentric heterogenous peritoneal/body wall–based mass occupying the entire left hemiabdomen. The organ of origin could not be identified.

the mass or provide significant pain relief and offered palliative resection of the mass for symptomatic relief. We informed the patient that the resection would not have any impact on his overall poor prognosis, especially regarding his metastatic lung cancer. We also informed him of the significant risks of attempted surgical resection, including bleeding, infection, bowel injury, the possible need for bowel resection or prolonged mechanical ventilation especially in the setting of advanced lung cancer, and death.

In October 2014, the patient underwent an exploratory laparotomy that revealed a 24 cm left-sided tumor adherent to the left abdominal wall, mesentery, omentum, and small bowel. These adhesions were carefully taken down, and the tumor was mobilized outside the abdomen (Figure 2A). The tumor originated from the jejunal mesentery with a 25 cm loop of jejunum firmly adherent to the mass approximately 15-20 cm from the ligament of Treitz. The piece of the jejunum that was adherent to the mass was resected, and the mass was removed en bloc from the abdominal cavity (Figure 2B). A primary, side-to-side stapled small bowel anastomosis was performed, followed by irrigation and closure of the anterior abdominal fascia and skin. The patient's postoperative hospital course was unremarkable, and he was discharged home in stable condition after 6 days. At his 2-week postoperative clinic visit, he was pain free, off all narcotic pain medication, and tolerating a general diet. His wound appeared to be healing well without signs of breakdown or infection.

The pathology specimen consisted of a segment of small intestine with an attached large mesenteric mass that together weighed 2,652.5 g. The mass was located within the mesenteric fatty tissue and measured 24 × 22 × 12.5 cm; it was focally attached to the small intestine but did not grossly invade through to the lumen. The cut surface of the mass was solid and ranged from a light tan color to a congested and infarcted appearance. Microscopically, the mass was composed of monotonous bland spindle cells with oval nuclei, fine chromatin, inconspicuous nucleoli, and

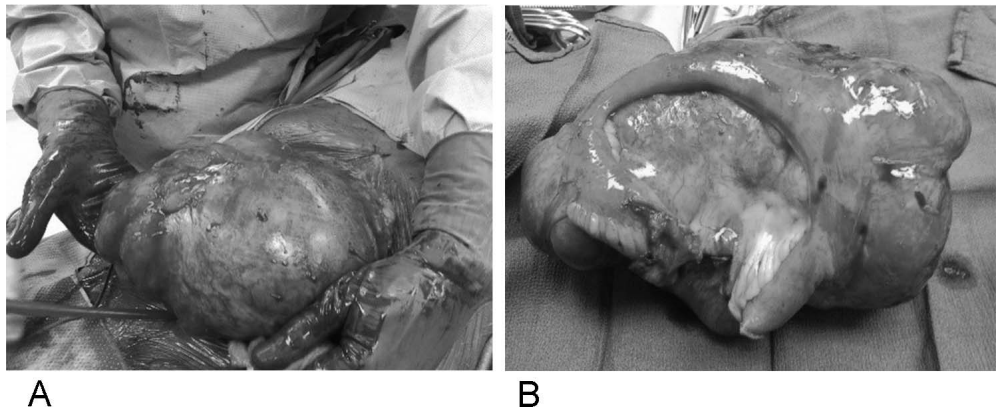

Figure 2. Intraoperative photographs of a large intraabdominal tumor. A: The tumor was mobilized and brought out of the abdominal cavity. The anterior surface measured 24 cm in length. B: The tumor resected en bloc originated from the jejunal mesentery and was adherent to the resected loop of jejunum.

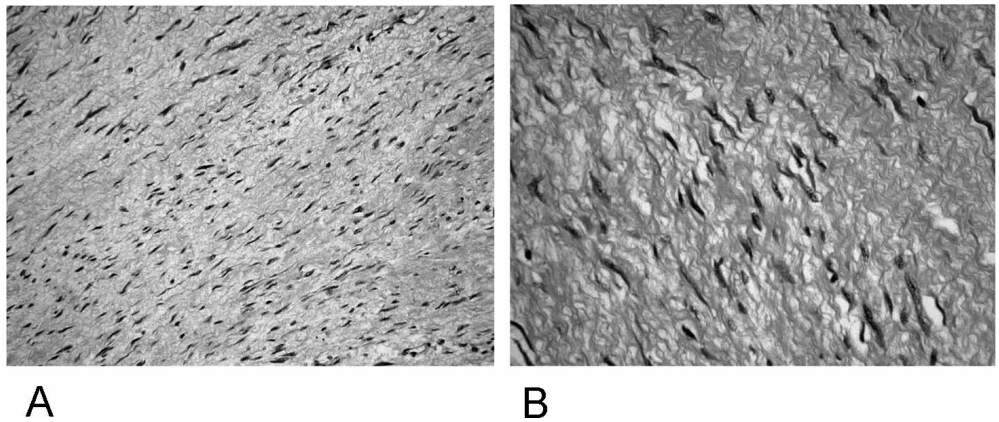

Figure 3. Microscopic pathology. A: Moderate cellularity and lack of necrosis of this spindle cell proliferation of sweeping cell fascicles in collagenous stroma are visible at 100× magnification. B: Monotonous bland spindle cells lacking pleomorphism or significant mitotic activity with interspersed collagen fibers are visible at 400× magnification.

eosinophilic cytoplasm arranged in vague fascicles of variable cellularity (Figure 3). The stroma ranged from dense collagenous to loose with vessels of moderate size. Necrosis of degenerative type was seen in some areas, but there was no significant atypia or mitotic activity. The mass infiltrated mesenteric adipose tissue and the small intestinal muscularis propria without invasion into the submucosa or mucosa. Immunostaining showed a positive reaction for β-catenin and some positivity for smooth muscle actin. Stains for CD117, CD34, and DOG1 were negative. These findings support the diagnosis of mesenteric fibromatosis.

DISCUSSION

Desmoid tumors can arise from within virtually any body site but are generally classified into 3 main anatomic locations: extraabdominal (trunk and extremities), along the abdominal wall, and least commonly, intraabdominal. The most likely location for an intraabdominal desmoid tumor is the mesentery, with desmoids being the most common primary tumor of the mesentery.[2] Most patients with intraabdominal desmoid tumors are asymptomatic until late in the tumor's course when they present with abdominal pain, a growing abdominal mass, possible gastrointestinal bleeding, and/or perforation.[3] Occasionally, the tumors are found incidentally during a radiograph or a laparotomy.

No clear treatment guidelines for mesenteric fibromatosis exist. Drawing meaningful conclusions from studies of patients with desmoid tumors is challenging for several reasons. Desmoid tumors are rare, limiting data collection, and the disease is heterogeneous on multiple levels. Desmoid tumors may occur sporadically or in patients with known familial adenomatous polyposis (FAP). Patients with FAP have an 852-fold greater risk than the general population of having a desmoid tumor.[4] Desmoid tumors vary by location as previously discussed. Last, the natural history of desmoid tumors is variable and currently unpredictable. Treatment options that have been studied include complete surgical resection, radiation therapy, chemotherapy, antiestrogen therapy, nonsteroidal antiinflammatory drugs (NSAIDs), watchful waiting, and more recently, molecularly targeted therapy. Several case series and reviews have examined the role of these various treatment options specifically for mesenteric desmoid tumors and have reported mixed conclusions.

Regarding the role of surgery, a 2014 review of the literature concluded that surgical excision with negative margins should be the aim of treatment for mesenteric desmoid tumors whenever possible.[5] Other options should be reserved for recurrent or inoperative disease.[5] A case series published in 1989 that included 24 patients with FAP and mesenteric desmoid tumors concluded that nonsurgical treatment options such as tamoxifen and sulindac in combination may be beneficial, with surgical options reserved for patients with intestinal obstruction.[6] When operating on symptomatic patients, intestinal bypass is preferred to definitive resection, and minimal surgical manipulation seems to be associated with fewer postoperative complications and a reduced risk of tumor recurrence.[6] Another case series published in 1999 that included 70 patients with FAP and intraabdominal desmoid tumors concluded that most of these tumors are indolent mass lesions that may vary a little in size but do not cause serious harm to the patient.[7] The study authors showed that in their patient cohort, medical treatments were usually ineffective and surgery was, at best, unwise and, at worst, the cause of disastrous complications. A small proportion of desmoid tumors grow rapidly and usually lead to the patient's death. For these patients, the authors point out that antisarcoma-type chemotherapy is the only hope.[7] Last, a 2009 case series of 16 patients with sporadic intraabdominal desmoid tumors concluded that an aggressive surgical approach for sporadic desmoid tumors may result in a cure and/or a very low recurrence and complication rate.[8] However, patients with FAP were excluded from this study, and this conclusion is in contrast to the conclusion of the case series that included patients with FAP. Complication rates in the FAP population were reported to be as high as 60% in one study.[9]

Regarding the role of medical therapy, a 2003 case series examined the effects of raloxifene, a selective estrogen receptor modulator, in 13 patients with FAP and refractory mesenteric desmoid tumors. The conclusion was that, in spite of some limitations, daily therapy with raloxifene

decreases desmoid tumor and mesenteric fibromatosis size, lessens symptoms, and does not cause side effects.[10] Hansmann et al studied high-dose tamoxifen and sulindac as a first-line treatment for desmoid tumors.[11] The group concluded that high-dose tamoxifen and sulindac in combination is a recommended primary therapy for patients with FAP-associated and sporadic extraabdominal desmoid tumors.[11] The study population did not include patients with sporadic intraabdominal tumors. Penel et al studied the role of imatinib for progressive and recurrent desmoid tumors. They concluded that imatinib may be considered a potentially effective treatment option in the management of recurrent desmoid tumors.[12]

Gronchi et al summarized current knowledge about all types of sporadic desmoid tumors and proposed a treatment algorithm based on the patient's symptoms, disease progression, and tumor resectability.[13] Classically, resection with negative margins was the standard of care for all desmoid tumors. However, the importance of margins is not clear. Several large case series have shown that positive margins seem to be an important prognostic factor for local recurrence-free survival, while others have not.[14-17]

Radiation therapy has been studied as both a primary and an adjuvant treatment for desmoid tumors. Nuyttens et al published a review of 22 articles with the intent to compare surgery, radiation, and a combination of the two in terms of local control rates.[18] They concluded that the best local control of desmoid tumors is achieved with either radiation therapy alone or surgery plus radiation therapy. Guadagnolo et al studied the optimal dose of radiation and concluded that radiation doses $>$56 Gy did not significantly improve local control but were associated with an increased risk of complications, especially in patients 30 years old or younger.[19] Complications included fibrosis, soft-tissue necrosis, anesthesia/paresthesia, pathological fractures, secondary malignancies, edema, and rarely, vascular complications requiring amputation. The current recommended dose of radiotherapy is 50-56 Gy in 2-Gy fractions.[19] Radiation therapy remains controversial, despite high rates of local disease control, because of the risk of complications, especially in younger patients. The review by Gronchi et al suggests radiation therapy should be used only for documented progressive disease when no other alternatives exist.[13]

Several studies have shown that certain desmoid tumors will spontaneously regress or stop growing in the absence of any treatment.[13] Thus, some physicians recommend a preliminary observational period with asymptomatic patients. Initially used in recurrent but stable disease, this strategy has now been expanded and shown to be safe in resectable primary disease. Fiore et al studied the validity of this approach by following 142 patients with desmoid tumors: 74 with primary tumors and 68 with recurrent tumors.[20] Fiore's group concluded that an observational period could be considered a safe approach for both primary and recurrent desmoid tumors.

Chemotherapy has also been studied, principally in patients with recurrent disease or disease that is not amenable to surgery or radiation. Two types of chemotherapy regimens exist. The first is low-dose methotrexate with vinblastine/vinorelbine, and the second, more conventional, regimen is doxorubicin $\pm$ dacarbazine.[13] Garbay et al studied chemotherapy regimens in 62 patients with either recurrent and/or unresectable desmoid tumors.[21] They concluded that chemotherapy has significant activity in desmoid tumors, and anthracycline-containing regimens are associated with a higher response rate compared to other treatments.[21] However, many physicians would first choose the low-dose regimen because of its limited toxicity profile.[13]

Most recently, molecularly targeted therapy with agents such as imatinib has been studied as a treatment for advanced, aggressive desmoid tumors. Initial studies were encouraging, but imatinib has yet to be proven particularly useful in prospective studies.[13] Two other anti–tyrosine kinase therapies are currently being investigated, namely sorafenib and pazopanib.[13]

CONCLUSION

No current standard treatment option for mesenteric desmoid tumors exists. Large symptomatic tumors often warrant some form of palliative, if not curative, attempt at removal. Resection with negative margins is a reasonable approach for this type of sporadic tumor. On the other hand, NSAIDs and antiestrogen therapy may be a reasonable first-line alternative associated with less morbidity and adverse side effects than surgery. Imatinib has not yet been shown to be an effective treatment option for primary mesenteric fibromatosis.

For our patient with a sporadic desmoid tumor who was seeking palliative treatment, negative margins were obtained, and thus no further adjuvant treatment was discussed. Further studies are needed to determine the optimal approach for a patient with a sporadic intra-abdominal desmoid tumor.

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