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Case Report

Desmoid tumor of the rectus abdominis mimicking a rectus sheath hematoma

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ABSTRACT

Aggressive fibromatosis, a synonym for desmoid tumours, is a rare kind of fibroblastic growth. Any musculoaponeurotic structure in the body may develop these tumours. They are categorized as benign because of a number of unique characteristics, including regular mitotic activity and no potential for metastasis but local recurrence is not uncommon. Surgical excision is highly recommended, and computed tomography (CT) is a valuable imaging modality. This report describes the appearance of a desmoid tumor in the anterior abdominal wall of a female patient, age 28, who had three prior caesarean sections. The procedure involved removing the tumor and then using polypropylene mesh to rebuild the abdominal wall. The patient was discharged 3 days post-surgery with no adverse complications and a follow up was done 6 months.

Keywords: Desmoid tumor, Abdominal wall mass, Rectus abdominis, Fibromatosis, Case report

INTRODUCTION

Desmoid tumors—or deep fibromatoses—are rare myofibroblastic neoplasms of aponeurotic origin. Despite their benign classification, they comprise 3% of soft tissue tumors, though they remain exceptionally rare among all neoplasms at a 0.03% incidence.[1] Desmoid tumors lack the capacity for systemic spread, notwithstanding their propensity for significant local tissue invasion.[2] Nonetheless, due to local invasion and impingement upon adjacent tissues, desmoid tumors exhibit a significant rate of recurrence. In anatomical sites where surgical excision is challenging, these tumors can prove fatal.[3] Notably, among individuals diagnosed with familial adenomatous polyposis (FAP) who have undergone colectomy, desmoid tumors represent the primary determinant of both morbidity and mortality.[4] Desmoid tumors predominantly manifest in the proximal limbs, the abdominal wall, and the mesenteric intestine of individuals diagnosed with familial adenomatous polyposis (FAP).[5] In instances of sporadic occurrence, these tumors are observed at sites of prior trauma,surgery, scarring, or irradiation. The optimal therapeutic approach for these neoplasms remains a subject of ongoing debate.

CASE REPORT

A 28-year-old female presented with a palpable swelling involving lower abdomen since 4-5months with pain over the mass for 1 month. She also reported progressive increase in size of the mass since the last 3-4 months. She had three prior cesarean section deliveries with last surgery 3 years ago. On examination; the mass was palpable in the hypogastrium involving the right iliac fossa and upper extent till umbilicus. Pre-operative CT scan revealed isodense mass in the lower abdomen within the rectus abdominus muscle of size measuring around 17 x10x10cm. Features suggestive of rectus sheath hematoma. Noticing the isodense nature of the swelling an incisional biopsy was done which confirmed the presence of spindle cell tumour most likely rectus sheath fibroma.

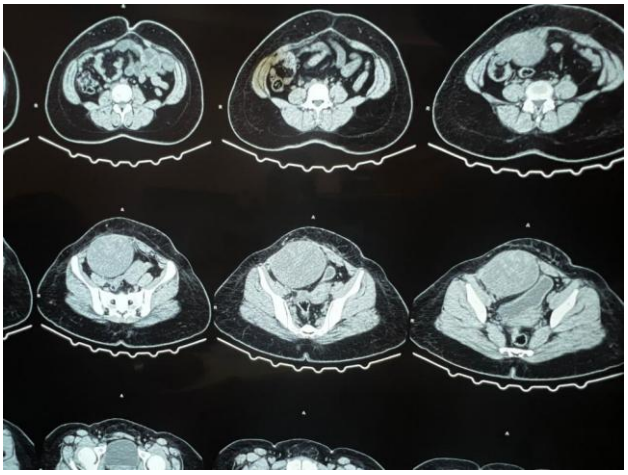

Figure 1: Axial cut sections of lower abdomen with iso dense lesion with mass effect displacing the urinary bladder on the right side.

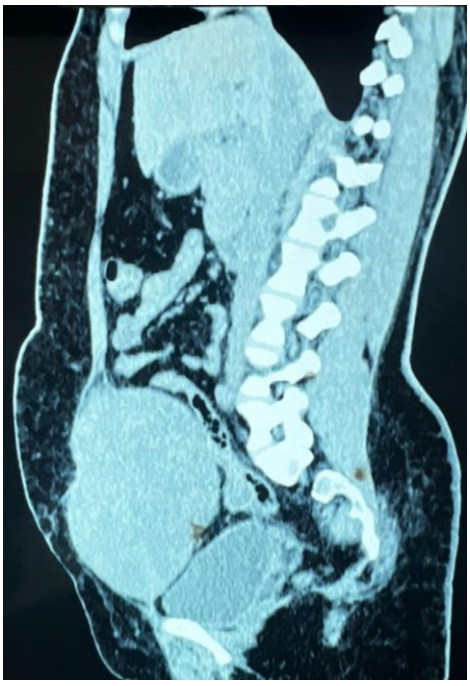

Figure 2: Sagittal cut sections of the abdomen showcasing the displacing effect of the mass in the lower abdomen.

Wide local excision of the tumor with partial resection of the internal oblique muscle was performed, followed by abdominal wall reconstruction using polypropylene mesh.

Histological examination

Microscopic evaluation of the resected specimen demonstrated spindle-cell tumors infiltrating the muscle tissue, with partially preserved muscle fibers encased by spindle-shaped cells. The tumor cells exhibited pale eosinophilic cytoplasm with chromatin-rich nuclei and were arranged within a collagenous stroma interspersed with fibrotic areas (Figure 3). Immunohistochemical analysis showed that a small proportion of the spindle tumor cells were positive for smooth muscle actin. The Ki-67 proliferative index was low, with less than 3% of tumor cells showing positivity. Based on these histopathological and immunohistochemical findings, a diagnosis of desmoid tumor was established.

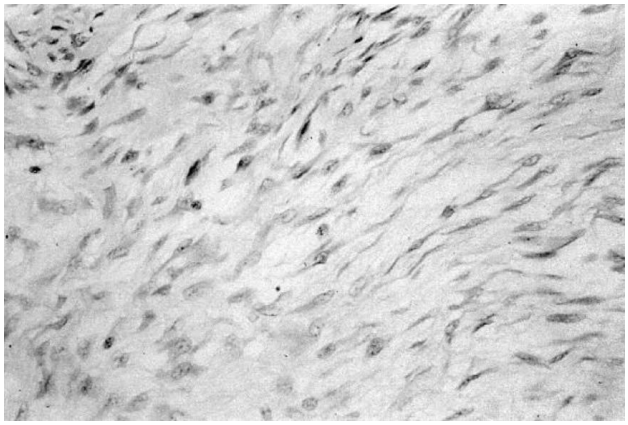

Figure 3: Fascicles of spindle cells with pale eosinophilic cytoplasm and nuclei and rare mitotic figures characterize the histological picture.

DISCUSSION

Desmoid tumors are classified into three main categories: intra-abdominal, abdominal wall, and extra-abdominal types. Although their anatomical locations differ, they share similar histopathological features. Approximately 60% of desmoid tumors arise in extra-abdominal sites, about 15% occur within the abdominal cavity, and the remaining 25% involve the abdominal wall.[6] Extra-abdominal desmoid tumors show a wide distribution, most commonly affecting the shoulder girdle, lower limbs, and trunk.

Intra-abdominal desmoid tumors are most often identified in patients with familial adenomatous polyposis. The association of desmoid tumors with this condition is commonly termed Gardner syndrome and is reported in nearly 2–5% of affected individuals.[7]

Numerous reports in the scientific literature have demonstrated a clear association between the development of abdominal wall desmoid tumors and the periods of pregnancy and the postpartum state.[8] Most documented cases describe desmoid tumors arising in the abdominal wall of women shortly after childbirth, with a marked predilection for the right rectus abdominis muscle, similar to the presentation in the present case. The differential diagnoses in this patient include inflammatory lesions, endometriosis, and hematoma. However, the patient's clinical history, physical examination, and laboratory investigations showed no abnormalities, which is often helpful in narrowing the differential diagnosis. Clinical palpation and ultrasonography are insufficient to accurately determine

the tumor's origin or to reliably distinguish it from endometriosis. The principal ultrasonographic characteristics of desmoid tumors include an oval shape, poorly defined margins, and a heterogeneous echotexture with mixed hypo- and hyperechoic areas.[9] On ultrasound examination, these lesions appear as masses with variable echogenicity, and their peripheral borders may at times be ill-defined or irregular.

The exact pathogenesis of desmoid tumors, including those occurring in association with pregnancy, is not fully understood. It has been proposed that hormonal and immunological changes during pregnancy or the postpartum period may contribute to their development. In addition, mechanical factors such as the stretching and pressure exerted by an enlarging uterus are thought to play a possible role.[10]

Accurate preoperative diagnosis requires tissue sampling, typically through a core needle or incisional biopsy. Although excisional biopsy provides the most definitive diagnosis, a fine-needle aspiration (FNA) biopsy may be considered prior to surgical intervention. FNA is generally useful in confirming the benign nature of desmoid tumors, though occasional false over- or under-diagnosis of malignancy can occur; therefore, core needle biopsy is considered more reliable. FNA smears of desmoid tumors tend to show consistent cytologic features, although sample adequacy varies widely, ranging from sparsely cellular to highly cellular preparations. Core needle biopsy specimens typically demonstrate prominent fascicles of collagen-producing spindle cells composed of fibroblastic and myofibroblastic elements without cytologic atypia. Thin-walled, ectatic blood vessels characteristic of desmoid tumors are frequently observed. Ultrastructural examination reveals spindle cells with features of myofibroblasts, supporting the concept of abnormal proliferation of myofibroblasts that normally regress after wound healing. These findings contrast with fibrosarcoma, which is characterized by increased mitotic activity, a higher nuclear-to-cytoplasmic ratio, greater vascularity, reduced collagen production, and fewer inflammatory cells.[11]

Histopathologically, desmoid tumors consist of spindle-shaped fibroblasts and myofibroblasts. These cells are characterized by thin, tapering cytoplasmic processes, elongated vesicular nuclei with otherwise typical morphology, and the presence of small, inconspicuous nucleoli. The cells are arranged in a linear pattern, with each cell surrounded and separated by a dense collagen-rich stroma.[12] The diagnosis of desmoid tumors depends largely on a multimodal imaging approach, including ultrasonography, computed tomography, and magnetic resonance imaging. Identifying a desmoid tumor can be challenging, as it is often mistaken for rectus sheath hematoma or parietal endometriosis because of overlapping clinical features and nonspecific imaging findings. Ultrasonography may aid in differentiation by localizing the lesion as desmoid tumors typically appear as oval masses with poorly defined margins and a heterogeneous echotexture, exhibiting mixed hypo- and hyperechoic areas.[13]

Computed tomography is routinely employed in the evaluation of desmoid tumors and is particularly valuable for assessing intra-abdominal lesions. Similar to ultrasonography, the CT appearance of these tumors is influenced by their relative collagenous and myxoid composition. Lesions with predominant myxoid content typically appear hypodense compared with skeletal muscle, whereas tumors rich in collagen or fibrous tissue may demonstrate iso- to hyperdense attenuation.[14,15] Following intravenous contrast administration, desmoid tumors generally show enhancement, although this is usually mild to moderate because of the variable proportions of myxoid and collagenous components within the lesion.[16,17] Tumor necrosis is uncommon.[18] CT imaging also provides crucial information for therapeutic planning, particularly regarding the tumor's relationship to major vascular structures and adjacent organs.

Magnetic resonance imaging(MRI) is particularly valuable in the assessment of desmoid tumors owing to its excellent soft-tissue contrast. The MRI appearance of desmoid tumors largely reflects their underlying histological composition.[15-19] Fibrotic and collagen-rich components typically demonstrate low signal intensity on T2-weighted images and exhibit mild to moderate enhancement, most notably on delayed post-contrast sequences. In contrast, areas with abundant cellular stroma and myxoid matrix appear heterogeneously hyperintense on T2-weighted images and show moderate to marked enhancement following intravenous contrast administration. A characteristic MRI finding, observed in approximately 60–90% of desmoid tumors, is the presence of linear, non-enhancing bands that are hypointense on both T1- and T2-weighted images, commonly referred to as the "band sign".[19] Magnetic resonance imaging is particularly valuable in the assessment of desmoid tumors owing to its excellent soft-tissue contrast. The MRI appearance of desmoid tumors largely reflects their underlying histological composition.[15-17] Fibrotic and collagen-rich components typically demonstrate low signal intensity on T2-weighted images and exhibit mild to moderate enhancement, most notably on delayed post-contrast sequences. In contrast, areas with abundant cellular stroma and myxoid matrix appear heterogeneously hyperintense on T2-weighted images and show moderate to marked enhancement following intravenous contrast administration. A characteristic MRI finding, observed in approximately 60–90% of desmoid tumors, is the presence of linear, non-enhancing bands that are hypointense on both T1- and T2-weighted images, commonly referred to as the "band sign".[19]

Surgical treatment of desmoid-type fibromatosis is particularly challenging because of its rarity and its

tendency to infiltrate surrounding normal tissues. Management strategies must therefore be individualized according to each patient's clinical presentation. In cases where desmoid tumors are asymptomatic and demonstrate stability, a conservative strategy with active surveillance and imaging follow-up every three to six months is commonly recommended. Intervention becomes necessary in symptomatic patients, especially when the tumor produces a mass effect on critical anatomical structures.

Surgical excision remains the mainstay of treatment for extra-abdominal desmoid tumors, including those arising from the abdominal wall, as in the present case.Surgery always aims at radical tumor resection with free margins, which, depending on localisation of surgery, may leave major soft tissue defects behind. Although abdominal wall integrity after full-thickness surgery can be restored with direct sutures, reconstruction with synthetic materials is a common technique in major abdominal wall defects.[20] Although some authors suggest that local recurrence may not be strictly associated with margin status, the majority of studies support wide surgical resection with clear margins to minimize the risk of recurrence.

CONCLUSION

Desmoid tumors of the abdominal wall, although histologically benign, represent a significant diagnostic and therapeutic challenge because of their locally aggressive behavior and high propensity for recurrence. This case underscores an important diagnostic pitfall, as desmoid tumors may closely mimic rectus sheath hematoma or other benign abdominal wall lesions on initial imaging, particularly on CT, leading to potential delays or misdirected management. Radiological findings alone may be insufficient for definitive differentiation; therefore, pre-operative tissue diagnosis through core needle or incisional biopsy is strongly advocated whenever imaging characteristics are indeterminate. Establishing histopathological confirmation prior to definitive surgery helps prevent unnecessary or inadequate excision and allows for optimal surgical planning.

Furthermore, the management of desmoid-type fibromatosis should ideally involve a multidisciplinary approach, incorporating the expertise of general surgeons, radiologists, pathologists, and, when necessary, oncologists and reconstructive surgeons. Such collaboration ensures accurate diagnosis, individualized treatment selection, adequate margin assessment, and appropriate reconstruction of abdominal wall defects while minimizing recurrence risk and functional morbidity. Early recognition of this entity and coordinated team-based management is essential to achieving favorable clinical outcomes.

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