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EXPANDING THE BOUNDARIES OF ABDOMINAL WALL RECONSTRUCTION: A NOVEL APPROACH USING BILATERAL TAR AND FASCIA LATA FLAPS IN A HUGE DESMOID TUMOR

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ABSTRACT
A desmoid tumor of anterior abdomen wall is a very rare malignancy with high potential for local recurrence even though it does not have any metastatic potential. Due to its local recurrence, wide excision acts as one of the main treatment modality in management of these tumors .This tumour is not amenable to other forms of treatment like chemotherapy, radiotherapy and immunotherapy to a larger extent. Hence surgery becomes one the major modality of treatment in these types of neoplasm. Large desmoid tumour when excised leaves a defect which needs to be reconstructed.
Here we are presenting a young female patient with hugh anterior abdomen wall desmoid tumor, in whom we have managed successfully by using excision and novel methods of abdomen wall reconstruction.

KEYWORDS: desmoid tumor, malignancy, radiotherapy, immunotherapy .

INTRODUCTION

Minimally invasive techniques have revolutionized inguinal hernia surgery, with the enhanced-view totally extraperitoneal (eTEP) approach emerging as a preferred method of treatment for inguinal hernia. A crucial technical factor in eTEP is port positioning, which directly impacts surgical ergonomics, dissection ease, and procedural outcomes.Two main strategies are employed, Ipsilateral port positioning and contralateral port positioning.

Ipsilateral port positioning

Desmoid tumors, also known as aggressive fibromatosis, are rare benign fibroblastic neoplasms characterized by infiltrative local growth and a tendency for recurrence, without the potential for distant metastasis. They account for approximately 3% of all soft-tissue tumors, with an estimated annual incidence of 5–6 cases per million population. Desmoid tumors predominantly affect young adults, with a female predominance, and are commonly associated with the abdominal wall and intra-abdominal sites.
Abdominal wall desmoid tumors may arise spontaneously or in association with previous abdominal surgery, trauma, pregnancy, or hormonal influences. Development within a previous lower-segment cesarean section (LSCS) scar is uncommon but represents an important differential diagnosis for a gradually enlarging abdominal wall mass. The pathogenesis is thought to involve aberrant fibroblastic proliferation following tissue injury, with mutations involving the CTNNB1 gene and activation of the Wnt/β-catenin pathway implicated in most sporadic cases.
Clinically, these tumors typically present as a firm, slowly enlarging mass and may be mistaken for more common scar-related conditions such as incisional hernia, suture granuloma, or scar endometriosis. Imaging, particularly magnetic resonance imaging, is valuable for assessing the extent of local infiltration and involvement of the abdominal wall musculature. Histopathological examination with immunohistochemical evaluation aids in confirming the diagnosis.
We report a rare case of a desmoid tumor arising within a previous LSCS scar, emphasizing the importance of considering desmoid fibromatosis in the differential diagnosis of postoperative abdominal wall swellings and highlighting the diagnostic and therapeutic challenges associated with this uncommon entity.

Case report:

A 29 year old female, P1L1, from Thiruvanamalai, homemaker, presented to the OPD with complaints of abdomen pain for 3 months. Patient was initially under dept of gynaecology where she was evaluated under the provisional diagnosis of an ovarian cyst following which the patient was transferred to the department of general surgery. History of last child birth 3 years back where she underwent LSCS in 2022
On examination, patient appears to be moderately built, vitally stable, showing showing no signs of pallor, icterus, cyanosis, clubbing, lymphadenopathy or oedema. On per abdominal examination, the abdomen was found to have huge mass of size 22x24cm seen occupying the lower half of the abdomen over the LSCS scar involving the RIF, LIF, hypogastric, umbilical and right lumbar regions, Lower border merging with the pubic symphysis , Firm to hard in

consistency, restricted mobility, arising from parietal wall (confirmed by straight leg raising test). All borders were well defined and palpable except the lower border

Fig. 1: Clinical assessment of mass over the anterior abdominal wall

Biochemical laboratory data showed no remarkable abnormality. MRI abdomen and pelvis was done and was reported as ?Soft tissue sarcoma of rectus muscle ? Desmoid tumor. Hence was proceeded with USG guided biopsy where ultrasound showed a fairly defined hetero-echoic lesion arising from the abdominal wall, likely right rectus abdominis muscle. Biopsy taken and sent for HPE. HPE showed features of Fibromatosis with (1) SMA - Strong cytoplasmic positivity in 70% of spindle cells. (2) β-catenin - Strong nuclear positivity in 80% of spindle cells. (3) CD34 - Negative. (4) S100 - Negative. (5) Ki67 labelling index - 3-5%.

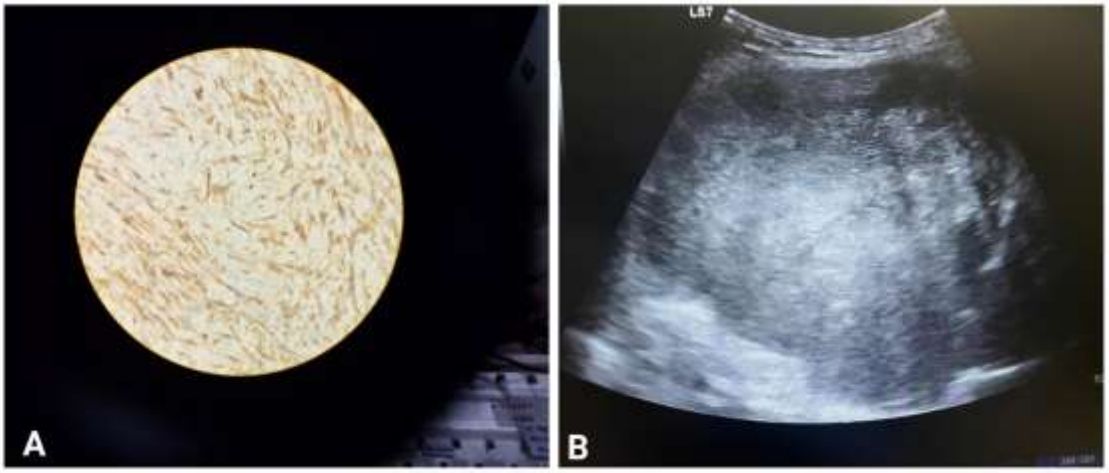

Fig. 2: (A) HPE showing features of Fibromatosis (B) Ultrasonography showing heterochoic lesion from Abdomen wall

Patient was then planned for neoadjuvant chemotherapy. 3 cycles of chemotherapy was given with Adriamycin, Vinblastin and Tamoxifen with no decrease in size clinically and radiologically.

Due to no response to chemotherapy, the patient was planned for surgical management, wide local excision with reconstruction. With the help of plastic surgery department, patient was planned for Wide local excision with 2cm margin with bilateral transverse abdominis release + rectorectus meshplasty and anterior abdomen wall reconstruction with bilateral fascia lata flap.

On the operating table, patient was placed in supine position and midline incision placed. Intraoperatively, Huge desmoid tumour was seen hanging form anterior abdominal wall and margins of tumor evaluated, tumor was seen intra abdominally without breaching peritoneum. Tumor margins evaluated and marked. 2.5cm (1inch) margins marked for clearance. Adhesion of the uterus to the anterior abdominal wall and fundus adherent to the uterus. Tumour was found not to cross the midline.

Hence tumor was excised with 2.5cm margin clearance on all sides and specimen excised, the tumor was found in very close proximity to the pubic symphysis and hence the periosteum was shaved off along with the tumour. A defect of size 25x24m was present.

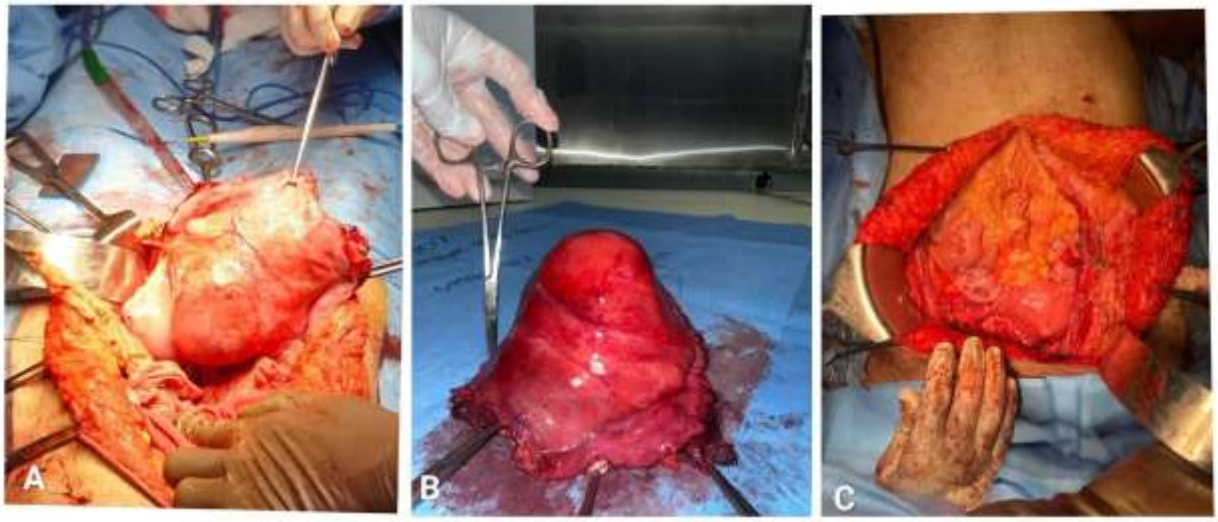

Fig. 3: (A)Tumor excised with 2.5cm margin clearance on all sides (B)Specimen of excised tumor (C) Anterior abdomen wall defect after excision of tumor

For reconstruction of the abdomen wall, bilateral TAR was performed, and the posterior wall strengthened with 30x30cm mesh.

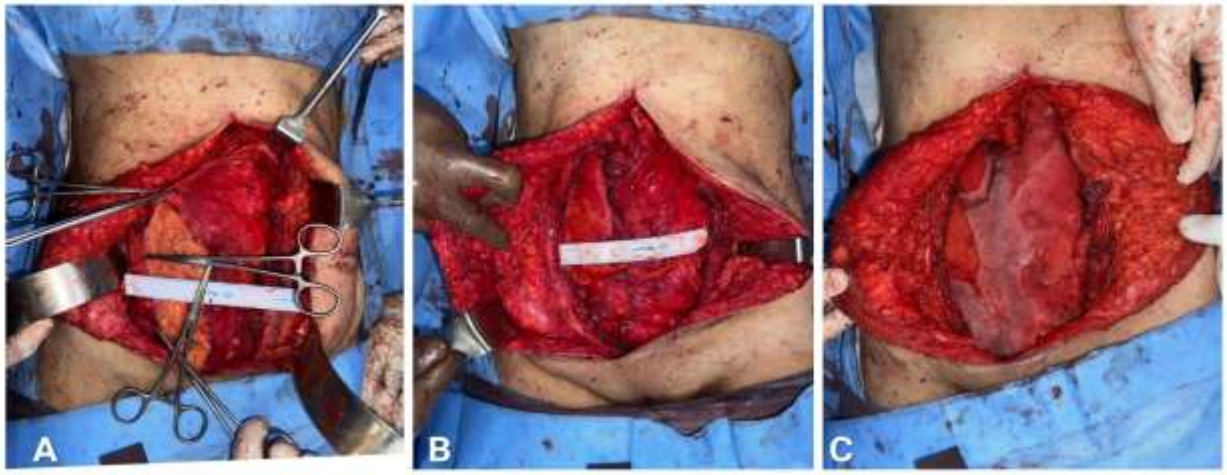

Fig. 4: (A) Unilateral TAR done on the left side (B) Bilateral TAR done (C)Posterior wall strengthened with 30x30cm mesh

The case was taken over by the plastic surgery department where left fascia lata free flap was taken and a vascularized right fascia lata flap with pedicle was taken and the anterior abdomen wall was strengthened by bilateral fascia lata flap. Drains were placed and abdomen was closed in layers.

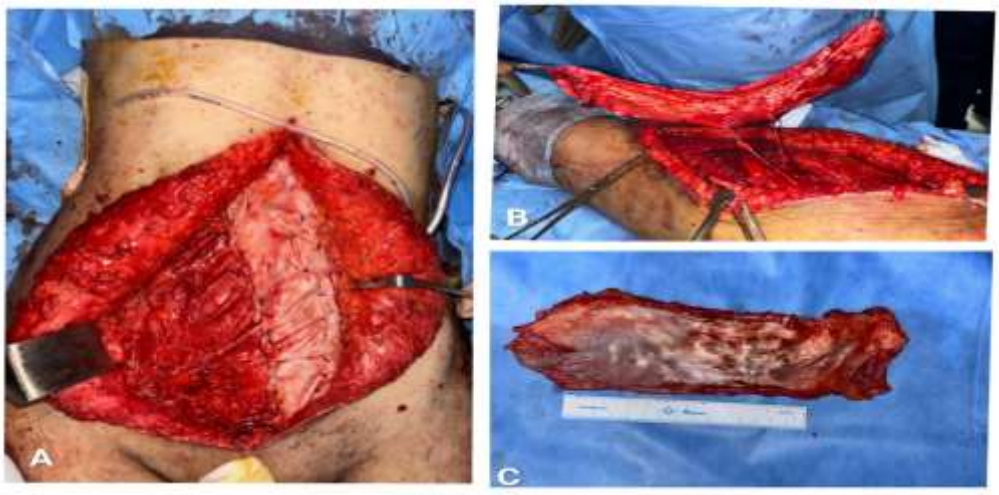

Fig. 5: (A) Anterior abdomen wall strengthened by bilateral fascia lata flap (B) Vascularized right fascia lata flap with pedicle (C) Left fascia lata free flap

Post operatively patient was stable. Patient's recovery was uneventful and hence patient was discharged on POD 5 after drain removal. Excised specimen sent for HPE showed neoplasm composed of uniform spindle shaped cells with pale to eosinophilic cytoplasm arranged in fascicles and storiform pattern in a collagenous stroma. No evidence of nuclear atypia , necrosis ,increased mitotic activity and lymphovascular invasion. After discussion with medical oncology, patient was started on Tab. Sorafenib therapy. Patient is in follow up for a period is 1 years with no recurrence. Patient is doing well and able to do normal household activities. No evidence of recurrences. No features of hernia. Patient was advised to not get pregnant and for adoption of 2nd child

DISCUSSION

Desmoid-type fibromatosis arising within a cesarean scar remains an exceedingly uncommon clinical entity. Only about five such cases arising from cesarean section scars had been reported in the literature as of one series, underscoring the rarity of the presentation described in our patient. The condition is thought to arise from an interplay of surgical trauma and the altered hormonal milieu of pregnancy and the puerperium; desmoid tumors are frequently associated with either surgical trauma such as scars or physiologic trauma such as pregnancy, and a tumor arising in a cesarean scar during pregnancy reflects both mechanisms acting together. Proposed etiological associations include familial adenomatous polyposis and hormonal states, which may account for accelerated tumor growth during pregnancy, although the estrogen–desmoid relationship is based largely on case reports and anecdotal data, since estrogen receptors are not consistently identified within these tumors, suggesting other growth mechanisms may also be operative. The clinical presentation of scar-related desmoid tumors is notoriously nonspecific and frequently mimics more common postoperative complications.
Management of desmoid tumors has evolved considerably over the past decade. Most desmoid tumors are now managed with initial active surveillance, with treatment reserved for symptomatic, high-risk, or progressing disease, and surgical resection reserved for life-threatening complications or for anatomically favorable, low-morbidity sites such as the abdominal wall. In our patient, the tumor's massive size, progressive symptoms, and intimate relationship to the pubic symphysis and rectus musculature precluded a surveillance strategy, and initial neoadjuvant chemotherapy with an anthracycline, vinca alkaloid, and anti-estrogen combination was trialed but failed to produce a clinical or radiological response. This is consistent with the recognized heterogeneity of response to cytotoxic regimens in desmoid fibromatosis, which has increasingly given way to less toxic, molecularly targeted options. Highly active systemic therapies including nirogacestat and sorafenib now offer improved efficacy and reduced toxicity compared with historical cytotoxic chemotherapy regimens such as low-dose methotrexate with vinblastine or anthracycline-based combinations.
A randomized trial established the efficacy of sorafenib in patients with progressive or symptomatic desmoid tumors, supporting its antitumor activity both as first-line therapy and in patients who have progressed on other treatments, which informed the decision to initiate sorafenib in our patient postoperatively given the tumor's aggressive local behavior and large size.
Definitive surgical resection with negative margins remains the mainstay when treatment is indicated for abdominal wall disease, but the resulting defects can be extensive, as in our case, where excision of a 22 × 24 cm mass created a 25 × 24 cm abdominal wall defect. Reconstruction of such large defects requires a multidisciplinary approach combining components-separation techniques, mesh reinforcement, and vascularized or free tissue transfer. The use of bilateral transversus abdominis release with mesh reinforcement of the posterior sheath, supplemented by bilateral fascia lata flaps for anterior wall strength, reflects an evolving reconstructive strategy for massive abdominal wall defects following oncologic resection, balancing durability against the risk of hernia recurrence. The uneventful postoperative course and absence of hernia or local recurrence at one-year follow-up in our patient support the durability of this combined resection–reconstruction approach, though desmoid tumors are well recognized for their propensity for late recurrence, and longer-term surveillance is required before durable disease control can be confirmed.
Finally, given the postulated hormonal sensitivity of this tumor and its documented association with pregnancy, the recommendation against future pregnancy and consideration of adoption for a second child in our patient is a reasonable precaution, consistent with case reports describing desmoid tumor growth accelerating during subsequent pregnancies and the challenges of monitoring or timing intervention around a gestation.

CONCLUSION

Desmoid tumor arising within a lower-segment cesarean section scar is a rare but important differential diagnosis for a gradually enlarging abdominal wall mass in women with prior cesarean delivery, and it should not be dismissed as a routine incisional hernia, suture granuloma, or scar endometrioma. Its nonspecific clinical and radiological features necessitate a high index of suspicion, with MRI characterization and image-guided biopsy with immunohistochemistry being central to accurate diagnosis. Management requires individualized, multidisciplinary planning that weighs tumor size, location, symptomatology, and reproductive considerations; in tumors unresponsive to systemic therapy or those causing significant symptoms or structural compromise, wide local surgical excision combined with advanced abdominal wall reconstruction techniques can achieve good oncological and functional outcomes, as demonstrated in our patient, who remained recurrence-free at one year with restoration of normal daily activity. Adjuvant systemic therapy with agents such as sorafenib may have a role in reducing recurrence risk in high-risk resections, though longer follow-up and larger case series are needed to define its benefit in this setting. Given the tumor's propensity for local recurrence and its association with hormonal states such as pregnancy, sustained long-term surveillance and counseling regarding future pregnancy remain essential components of comprehensive patient

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