Case study

Transversus abdominis muscle release for a rare case of complex ventral hernia with desmoid tumour

Abstract :

Desmoid tumour in previous laparotomy scar is a rare clinical entity in men. The gold standard treatment for desmoid tumour is surgical excision with a free resection margin, which leaves behind a defect in the abdominal wall. The presence of a pre existing complex ventral hernia makes the closure of the abdominal wall difficult. Of the various techniques described, posterior component separation using the transversus abdominis muscle release (TAR) is most suitable in such scenarios. We describe a case of a complex ventral hernia with a desmoid tumour that was surgically excised and the complex hernia was repaired using TAR technique.

Key Words:

Desmoid tumour, Transversus abdominis release, Posterior component separation

Introduction:

Desmoid tumours are benign myofibroblastic tumours that can develop anywhere in the body, including the limbs, abdominal wall and mesentery.[1] Their annual incidence in the general population ranges from 2 to 4 cases per million people, with a preponderance in females. [2] They have no metastatic potential but can infiltrate the local structures. The majority of desmoid tumours are sporadic. Nevertheless, they rarely occur in conjunction with familial adenomatous polyposis (FAP) or after previous surgical trauma. [3, 4] The treatment of desmoid tumour is complete excision with reconstruction of the abdominal wall defect.[5] The reconstruction is even more difficult when there is a pre-existing complex ventral hernia. Conventional abdominal closure techniques result in tension on the closure leading to unfavourable consequences. An effective solution to this issue is Transversus abdominis release.[6] Here, we describe a case of rare complex ventral hernia with a desmoid tumour that was surgically excised and the abdominal was reconstructed using transversus abdominis release method.

Case report :

A 55 year old man presented with a painless swelling over the previous laparotomy scar since the past 10 months. Five years ago, he underwent a laparotomy for a perforated peptic ulcer. He had a single, hard, spherical, non tender swelling that measured 7x7cms in the infra umbilical region. A large incisional hernia involving the entire laparotomy incision with a 15 cm wide defect was present (Figure 1).
A contrast enhanced CT scan revealed a single, well-demarcated lesion measuring 7x7 cms in size arising from the anterior abdominal wall devoid of any intra abdominal involvement (Figure 2). The CT also revealed a large incisional hernia with a defect 15 cm wide containing abdominal fat, colonic and small bowel loops, and atrophied recti (Figure 3). The patient underwent excision of the tumor with wide surgical margins that necessitated excision of the anterior abdominal wall all the way down to the peritoneum. Since the recti were

retracted laterally, they were difficult to bring to the midline (Figure 4). Since the defect was wide, it was decided to proceed with transversus abdominis release (TAR).

Step by step procedure followed for repairing the abdominal wall:

1) To avoid accidental enterotomy during repair, all the bowel loops and omentum were carefully released from the anterior abdominal wall.

2) An incision was made 1 cm from the medial margin on the posterior rectus sheath to enter the retro rectus space. The neurovascular bundles were preserved while extending the space.

3) The fibres of the transversus abdominis muscle were hooked by a mixter and divided by electrocautery along its entire insertion line at the level of semilunaris (Figure 5).

4) A large space was created for the mesh, which extended cranially from the xiphoid up to the pubic symphysis inferiorly and laterally until the bilateral psoas were visualized.

5) The posterior rectus sheath was approximated in midline using delayed-absorbable sutures without any tension over the suture line (Figure 6).

6) A polypropylene mesh of size ~30 × 20 cm was placed over the posterior rectus sheath (Figure 7).

7) Suction drains were placed over the mesh. The anterior rectus sheath was approximated in the midline without tension. Skin closed in the midline after placing a suction drain in the subcutaneous space (Figure 8).

The postoperative course was uneventful, and patient was discharged on the ninth postoperative day. The diagnosis of a desmoid tumor with negative surgical margins was confirmed on the histopathological report. The patient had no recurrence at 12 months of follow-up.

Discussion:

Desmoid tumour is a benign locally invasive fibromatosis arising from the aponeurosis and muscles. This condition was first described by Mac Farlane in 1832.[7] The term "desmoid" comes from the Greek word "desmos" which means “like a tendon” and was coined by Muller in 1838.[7] The anterior abdominal wall is the most common location for desmoids tumours. Other locations where they can be found include the thighs, chest wall, and shoulder girdle.[8]

The majority of desmoid tumours occur sporadically. Desmoid tumour can also be caused by surgical trauma and familial adenomatous polyposis.[3,4] Postpartum women are more likely to develop desmoids tumours, which raises the possibility that oestrogen acts as a regulatory factor.

Desmoid tumor of the abdominal wall usually present as a solid mass with indistinct margins. Myofibroblasts and elongated fibroblasts make up the desmoids tumour histologically. CT or MRI being the preferred imaging modality for determining the extent of invasion.[9] Surgical excision is the treatment of choice. The peritoneum, intra-peritoneal organs, or adjacent

structures invaded by the tumour ought to be resected. In event of positive surgical margins or incomplete tumour resection, the likelihood of local recurrence increases. Radiation therapy, chemotherapy, hormonal therapy or non steroidal anti-inflammatory drugs are additionally used in such patients to minimise the recurrence.[10]Complete resection with a wide margin is required to prevent recurrence, which can result in a large defect in the abdominal wall. The conventional methods of abdominal closure may not be sufficient in such circumstances and the presence of large incisional hernia makes the repair even more challenging. Therefore, the newer techniques of abdominal wall reconstruction need to be sought.

The classic Rives–Stoppa hernia repair, first described in the 1970s, involves placing a large prosthetic mesh in the retro rectus space to cover the defect on either side of the midline. This has proven to be an effective method for repairing ventral hernia. However, in cases of larger defect, the Stoppa's repair alone is not sufficient to achieve a tension-free midline approximation.[11] The newer reconstructive technique of Transversus abdominis release (TAR) was introduced in 2012 by Novitsky.[12] TAR is a modification of posterior component separation technique that involves the transversus abdominis myofascial release, allowing a significant midline advancement of the posterior rectus sheath, achieving a tension-free midline rectus closure. It also makes it possible to create a large space for the prosthetic mesh keeping the neurovascular bundles intact. The peri-operative morbidity and recurrence are both low with this method.[6, 13]

Conclusion:

The gold standard treatment of desmoid tumour is excision with wide surgical margin, with immediate reconstruction of the abdominal wall. Pre-existing complex abdominal hernias poses more of a challenge in the repair. In such instances, posterior component separation using Transversus abdominis release (TAR) is a safe and effective abdominal wall reconstruction technique.

Ethical Approval:
As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

Consent
As per international standard or university standard, patient(s) written consent has been collected and preserved by the author(s).

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Figure 1: Showing desmoid tumour of size 7x7 cm in the infra umbilical region with a large incisional hernia involving the entire laparotomy incision

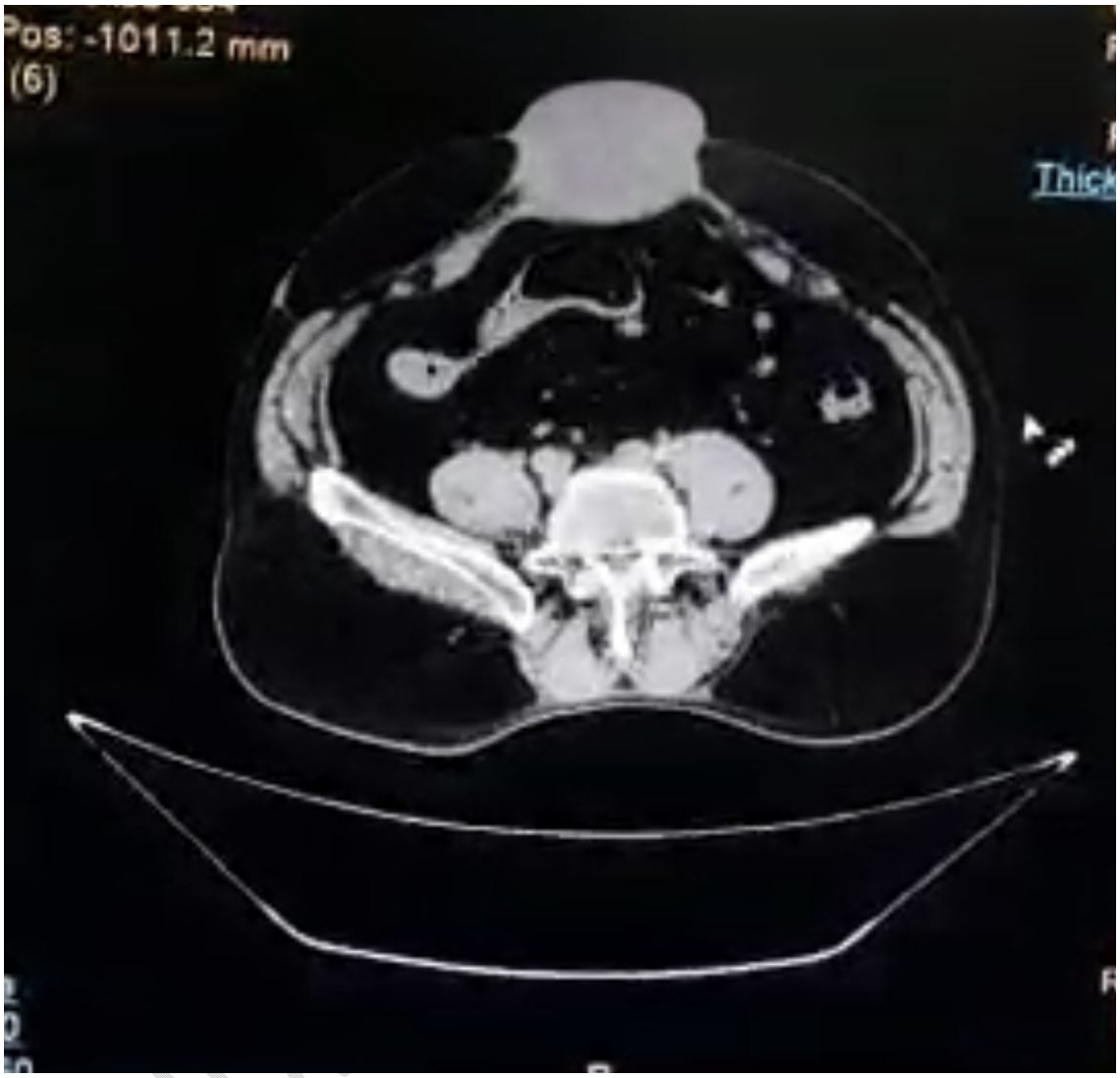

Figure 2: A contrast enhanced CT scan showing a single, well-demarcated lesion arising from the anterior abdominal wall devoid of any intra abdominal involvement.

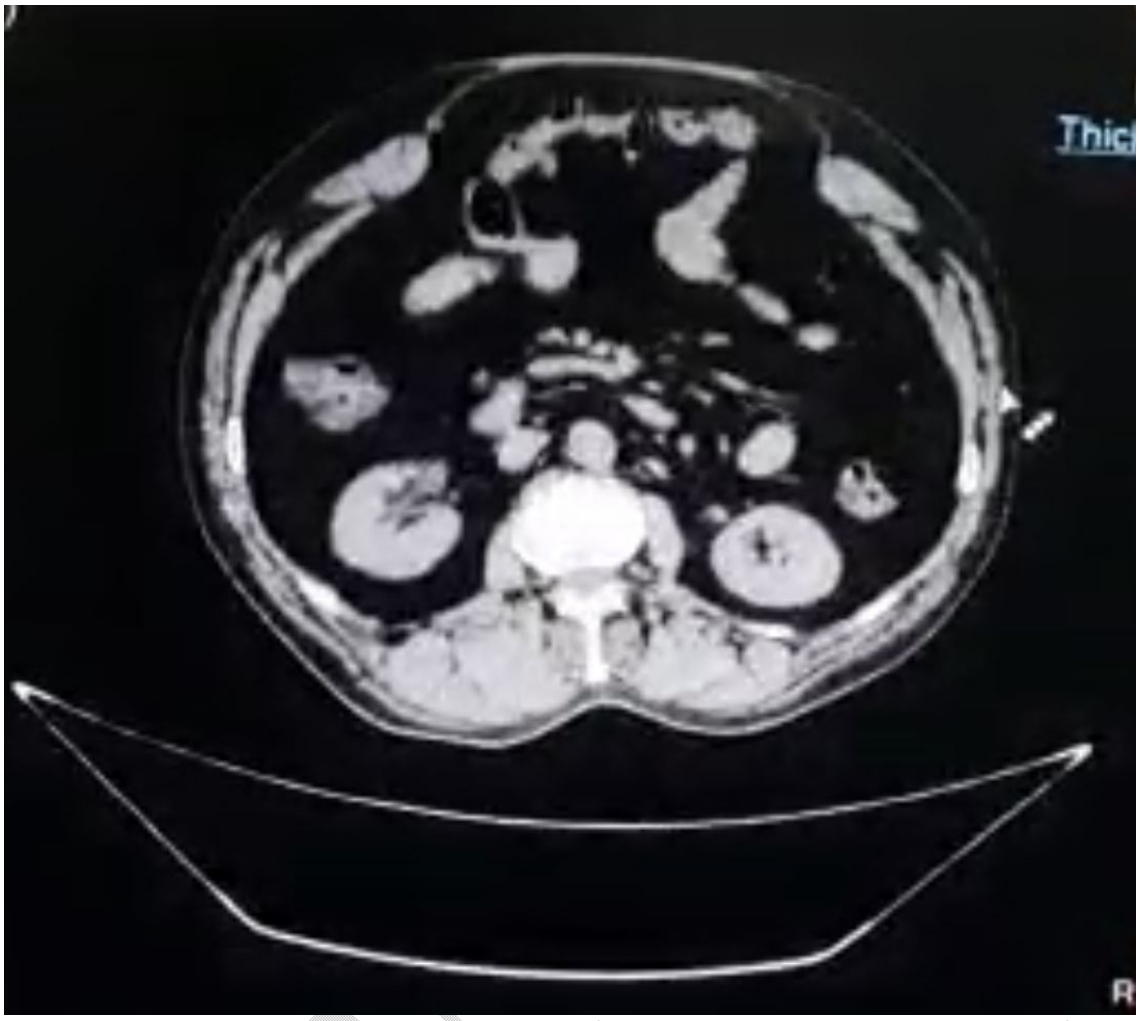

Figure 3: CT showing incisional hernia with a defect 15 cm wide containing abdominal fat, colonic and small bowel loops, and atrophied recti

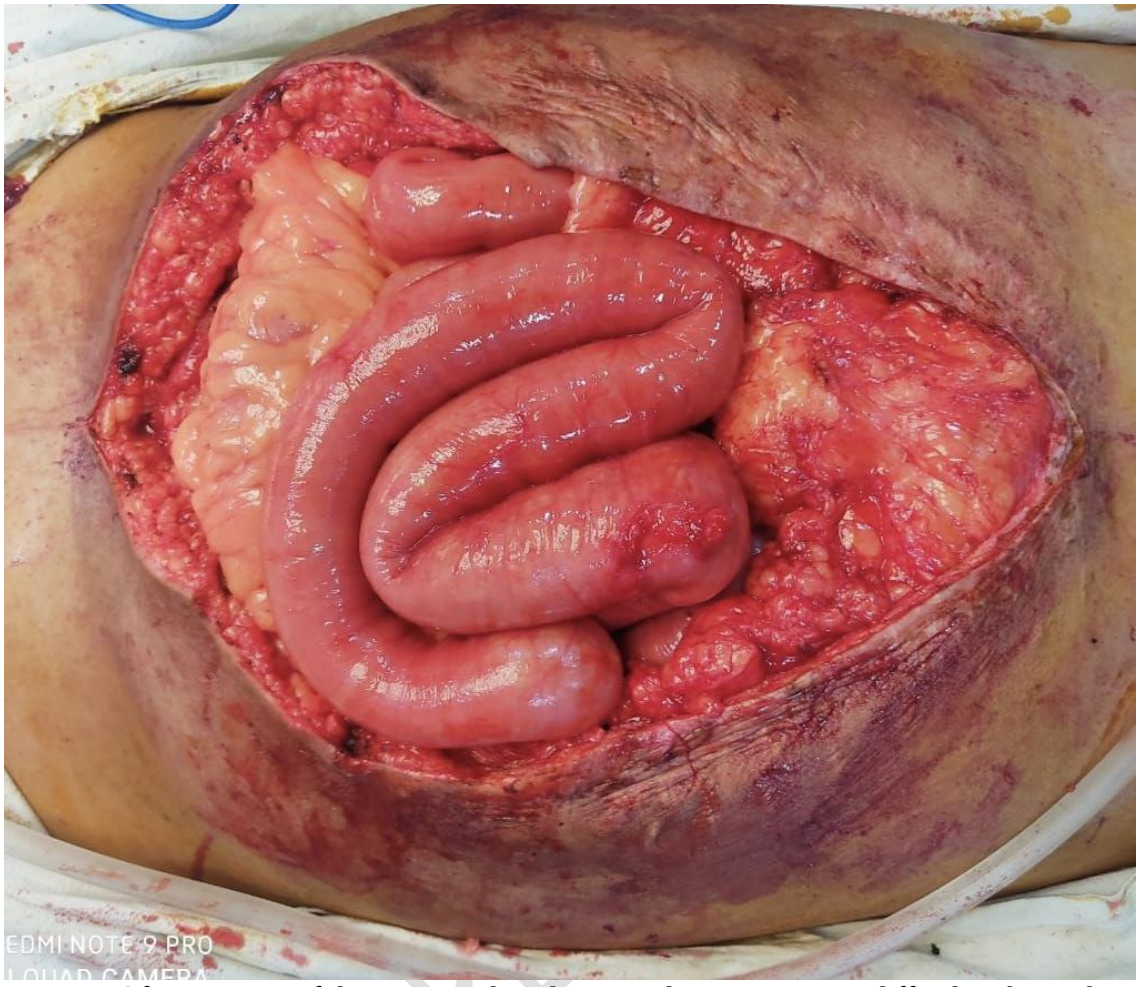

Figure 4: After excision of the tumor with wide surgical margins, it was difficult to bring the recti to the midline

Figure 5: Division of the transversus abdominis muscle at the level of linea semilunaris

Figure 6: Posterior rectus sheath approximated in midline using delayed-absorbable sutures

Figure 7: A polypropylene mesh of size ~30 × 20 cm placed over the posterior rectus sheath

Figure 8: Anterior rectus sheath and skin closed after placing suction drain