

# Fleur-de-lis Miniabdominoplasty Access in Radical Resection of a Large Abdominal Wall Desmoid Tumor

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**Summary:** Desmoid tumor (DT) is a rare benign soft tissue neoplasm that develops in the musculoaponeurotic structures, one-third of which involve the abdominal wall. Due to local aggressive infiltration of DT, the recurrence rate is approximately 45%–77%, according to the locations of the tumors, and 25%–50% for those with unclear surgical margins. Limited by adverse effects of radiotherapy and chemotherapy, surgical excision is still the standard management recommended. Differing from traditional midline or abdominoplasty access, we applied a fleur-de-lis miniabdominoplasty access in a 37-year-old woman who had primary abdominal wall DT with less than 1 cm depth from the umbilicus. The approach not only provides a better surgical field for radical tumor excision but also eliminates redundant skin and dog-ear formation at bilateral flanks. An appropriate surgical margin could be processed simultaneously when the tumor was close to the skin surface. After abdominal wall reconstruction, the postoperative course was uneventful, and no DT recurrence or incisional hernia was noted during the follow-up. The patient was satisfied with the tumor treatment and aesthetic outcome. (*Plast Reconstr Surg Glob Open* 2023; 11:e5362; doi: [10.1097/GOX.0000000000005362](https://doi.org/10.1097/GOX.0000000000005362); Published online 26 October 2023.)

**D**esmoid tumor (DT), also called desmoid-type fibromatosis, is a rare neoplasm that constitutes only 3% of all soft tissue tumors.<sup>1</sup> Although most DTs are sporadic (90%), women have a higher prevalence of DT, and 20%–30% have previous pregnancy experience or surgical trauma.<sup>2</sup> Surgical excision is still the first-line treatment for resectable tumors, whereas nonsurgical treatments, including systemic chemotherapy, hormone therapy, nonsteroidal anti-inflammatory drugs, and radiation, have shown roles as alternatives.<sup>3,4</sup> The approach for abdominal wall DT resection is commonly via direct incision or preexisting scars; however, abdominoplasty access has been applied for a better cosmetic outcome.<sup>3,5</sup> Herein, we report a case of abdominal wall DT in a patient who underwent radical tumor excision via a fleur-de-lis miniabdominoplasty access.

## CASE

A 37-year-old woman with a history of vaginal delivery 3 years previously denied systemic disease before visiting. A lower abdominal lump with rapid enlargement was incidentally found in a year (Fig. 1). The accompanying symptoms include urinary frequency, nocturia (twice per night), abdominal distention, early satiety, fast hunger, and changes in bowel habits. Physical examination revealed a 15-cm solid and movable mass in the hypogastric region, without pain, tenderness, or skin lesions. A computed tomography (CT) scan revealed a large, well-circumscribed tumor, with focal heterogeneity arising from the musculoaponeurotic structure of the right anterior abdominal wall with rectus abdominis involvement. The anterior border of the tumor was less than 1 cm from the skin surface. [See Supplemental Digital Content 1, which describes a heterogenetic tumor with clear boundaries shown in the lower abdomen CT scan, originating from the right rectus abdominis and with size of approximately 13.8 × 7.9 × 12.0 cm. (A) Transverse view. (B) Coronal view, <http://links.lww.com/PRSGO/C828>.] Histopathology resulted in a fibroblastic lesion with characteristics of aggregates of fibroblast-like spindle cells dispersed throughout dense collagen, and desmoid-type fibromatosis was highly suspected.

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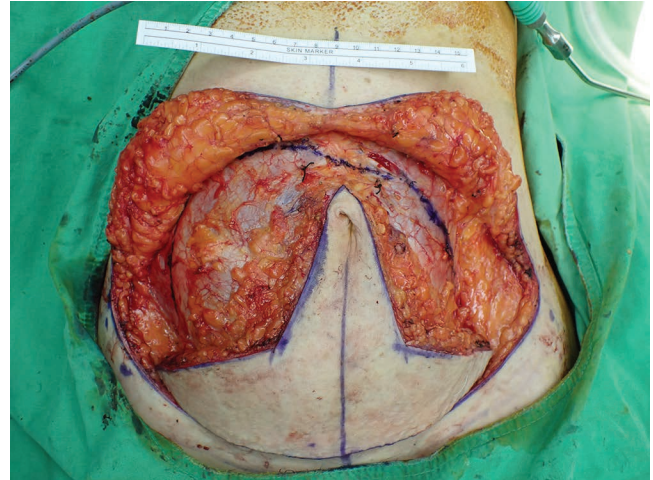


**Fig. 1.** Preoperation appearance.

Radical excision was performed via fleur-de-lis miniabdominoplasty access with umbilicus (Fig. 2). A 2-cm margin of healthy tissue was marked from the tumor border at the anterior sheet of the rectus abdominis (Fig. 3). The right rectus abdominis muscle was transected superiorly and inferiorly from the manufacturer. Owing to severe adhesion and intra-abdominal protrusion, the posterior sheet and peritoneum were both removed. Immediate abdominal wall reconstruction was performed with bilateral posterior component separation with transversus abdominis (TA) muscle release to advance both sides of the resection edges. We then approximated transversalis fascia (TF) and peritoneum with silk sutures to shrink the defect from 15×15 cm to 10×8 cm. An intraperitoneal



**Fig. 2.** Fleur-de-lis miniabdominal access for DT resection. The width of each lobe was evaluated by pinch test.



**Fig. 3.** A 2-cm healthy tissue margin was marked before entrance of the anterior sheet of the rectus abdominis muscle.

mesh (Covidien Parietex optimized mesh, 15×10 cm; Medtronic-Covidien, Minneapolis, Minn.) through intraperitoneal onlay mesh repair method was applied as a bridge graft to cover the defect of TF and an onlay polypropylene mesh (Covidien Parietene lightweight mesh, 30×30 cm; Medtronic-Covidien, Minneapolis, Minn.) between the TA and internal oblique muscle for the 12×12 cm oval defect left after tumor ablation. (See Supplemental Digit Content 2, which describes bilateral posterior component separation with transversalis abdominis release to advance both sides of resection edges. After transversalis abdominis release, we approximated TF and peritoneum primarily with silk suture to minimize the size and then applied composite mesh 15×10 cm through the intraperitoneal onlay mesh repair method as a bridge graft to cover the defect of TF, <http://links.lww.com/PRSGO/C829>.) After repair of the abdominal wall, the skin flaps were closed in layers with neo-umbilicoplasty performed at the tip of the fleur-de-lis design. Permanent pathology confirmed the diagnosis, and all margins were free of tumor cells. The postoperative course was uneventful, and the patient was discharged 1 week after surgery. No skin necrosis or surgical complications needed additional operation. At 1-year follow-up, the patient remained healthy, and the symptoms were all resolved with only a flat inverted T scar left (Fig. 4). Furthermore, there was no evidence of tumor recurrence or incisional hernia in the follow-up CT images.

## DISCUSSION

DTs do not metastasize but behave at a high local recurrence rate despite being resected with a negative margin, although they have a benign nature characteristic. In facing such a “benign malignancy” tumor as DT, the first-line treatment still lacks consensus. Complications following nonsurgical treatment, such as infertility and cardiotoxicity caused by chemotherapy, should thus be taken into consideration before application.<sup>3,4</sup> Negative resection margin (R0 resection) is controversial and no longer a remarkable



**Fig. 4.** One-year follow-up.

predictor of tumor recurrence in recent studies.<sup>3</sup> However, incomplete excision of the tumor may consequently be associated with recurrence; therefore, a 1- to 3-cm circumferential healthy tissue margin was recommended.<sup>3,5</sup> Wide local excision remains the primary treatment option for abdominal wall DTs because of its advantages of simple surgical technique and clear margins.<sup>6</sup> Abdominoplasty access had ever been presented for a broad operative field and better cosmetic outcomes,<sup>3,5</sup> although skin excision may not be necessary for resection of abdominal wall DT.

For this case, the defect of the TF and peritoneum could only be shrunk but not be repaired directly after bilateral posterior component separation. Besides, it was hard to reapproximate bilateral rectus sheaths due to large soft tissue loss. An additional polypropylene mesh was thus placed in a retromuscular position to strengthen the TF and peritoneum as a sandwich method so that bilateral rectus sheaths could be anchored on the polypropylene mesh. Fleur-de-lis abdominoplasty is a well-known surgical method for the modification of traditional panniculectomy with an additional vertical component instead of a fusiform design, to eliminate redundant skin and soft tissue and make the abdominal contour tighter and flatter after the surgery.<sup>7</sup> This technique appears to be safe and popular in abdominoplasty in patients with massive weight loss who have remarkable excess epigastric skin.<sup>8</sup> Fleur-de-lis design has also been commonly used in flap harvest. By folding the three lobes, the soft tissue could be stacked into a dome shape for a better projection for breast reconstruction.<sup>9,10</sup>

Fleur-de-lis abdominoplasty access offers a better surgical view than traditional abdominoplasty access or the midline approach. The utility of traditional abdominoplasty access may only be indicated for tumors found in the lower abdominal wall because of the difficulty in exposing the upper border of the tumor if it is located superior to

the umbilicus. The midline approach is the most common surgical route for intra-abdominal surgery; however, as it provides a direct and simple approach to visceral organs, it is limited by the adequate exposure of the lateral abdominal wall. Tumor excision through the traditional abdominoplasty approach could avoid a remarkable midline scar, compared to the midline approach, and hinder the scar within the suprapubic area, but the access without excision of redundant skin and soft tissue might consequently lead to unsatisfactory aesthetic outcomes or dog-ear formation at bilateral flanks, whereas large abdominal tumors are known to work to a certain degree as a tissue expander. Based on the fleur-de-lis incision, the surgical field could be exposed with limited undermining of the abdominal flaps, which is thought to preserve most of the residual intercostal perforators. Although the fleur-de-lis incision causes a longitudinal scar, in this case, we performed miniabdominoplasty only. The neo-umbilicus could be created at the tip of the vertical limb, which was only 10 cm from the transverse incision line. Last but not least, Cesarean section and normal vaginal delivery were both mentioned to be safe after DT resection with mesh repair. Instrument assistance may be needed in normal vaginal delivery due to weakened muscle power in bearing down during the labor.<sup>11,12</sup>

## CONCLUSION

To manage lower abdominal wall masses, especially DT or soft tissue sarcoma, fleur-de-lis miniabdominoplasty access might offer benefits not only for a wide surgical field for tumor excision but also for a satisfactory aesthetic outcome.

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## DISCLOSURE

*The authors have no financial interest to declare in relation to the content of this article.*

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