

Combined Use of an Anterolateral Thigh Flap and Superficial Inferior Epigastric Artery Flap for Reconstruction of an Extensive Abdominal Wall Defect

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Summary: Reconstruction of large abdominal wall defects is challenging. We herein report the successful reconstruction of an extensive abdominal wall defect using a novel combination of flaps after sarcoma resection. A 74-year-old man presented with a dedifferentiated liposarcoma on his abdominal wall. He underwent excision of the tumor, which resulted in an extensive abdominal wall defect. The defect was reconstructed with a pedicled anterolateral thigh flap with an iliotibial tract and a pedicled superficial inferior epigastric artery flap. No skin graft was necessary. The wounds healed successfully, and no herniation occurred. The combination of an anterolateral thigh flap and a superficial inferior epigastric artery flap is a versatile option for reconstruction of extensive abdominal wall defects. (*Plast Reconstr Surg Glob Open* 2016;4:e1121; doi: 10.1097/GOX.0000000000001121; Published online 28 November 2016.)

The anterolateral thigh (ALT) flap is the workhorse flap for abdominal wall reconstruction.^{1,2} It can reach the upper abdominal wall with a wide rotation arc, and a large flap of more than 240 cm² can be harvested on a single perforator.³ If the defect is extensive, however, coverage with an ALT flap alone may be insufficient, and the use of an additional flap or skin graft becomes necessary.⁴ We herein report the successful reconstruction of an extensive abdominal wall defect using a combination of a pedicled ALT flap and a pedicled superficial inferior epigastric artery (SIEA) flap after sarcoma resection.

CASE REPORT

A 74-year-old man presented with a huge dedifferentiated liposarcoma on his abdominal wall. He underwent resection of the tumor after preoperative radiotherapy (39 Gy). Excision of the tumor resulted in a 35- × 30-cm abdominal wall defect including the left testicle (Fig. 1).

A 23- × 7-cm pedicled ALT flap including an iliotibial tract was elevated from the left thigh and transposed to the defect through the subcutaneous tunnel. The abdominal wall was covered with the iliotibial tract. However, the cranial side of the skin defect could not be covered with this flap. We, therefore, harvested a 32- × 7-cm SIEA flap from the right abdomen and transposed it in a clockwise direction to the remaining skin defect (Fig. 2). The SIEA flap was not made into a vascular island flap, and the skin bridge at the flap base was preserved because the right superficial inferior epigastric vein (SIEV) was sacrificed during tumor resection. Both donor sites were closed primarily, and no skin graft was necessary (Fig. 3).

The distal tips of the flaps became cyanotic postoperatively; however, the wounds healed conservatively. Three months after surgery, the patient had developed pulmonary metastases; however, he remained locally disease free, and no herniation occurred (Fig. 4).

DISCUSSION

Large abdominal wall defects after oncologic resection require stable and durable soft tissue coverage to prevent abdominal wall herniation or bulging. An ALT flap is the flap of choice for abdominal wall reconstruction. Several authors have described the usefulness and reliability of the ALT flap for abdominal wall reconstruction after oncologic resection.^{1,2} The main advantage of an ALT flap is that an iliotibial tract can be included in the flap. An iliotibial tract

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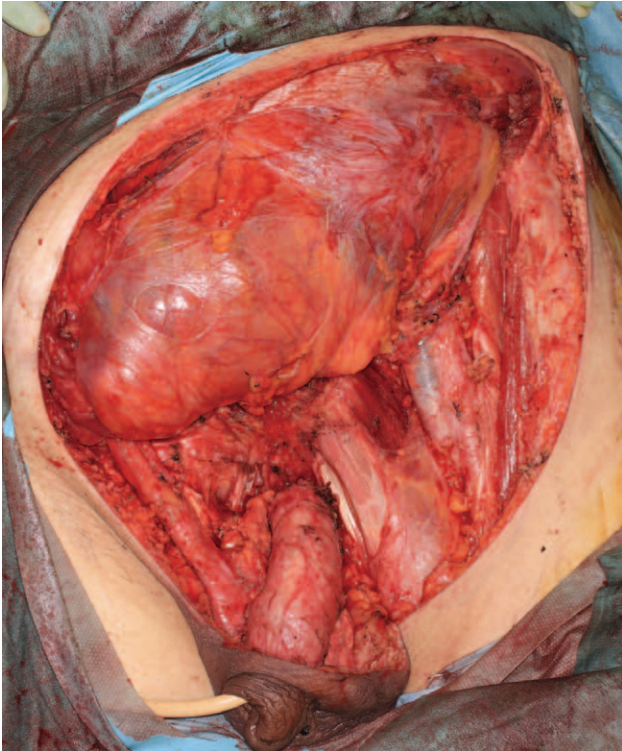


Fig. 1. Intraoperative appearance of the defect after tumor excision.



Fig. 3. Immediate postoperative appearance of the patient.

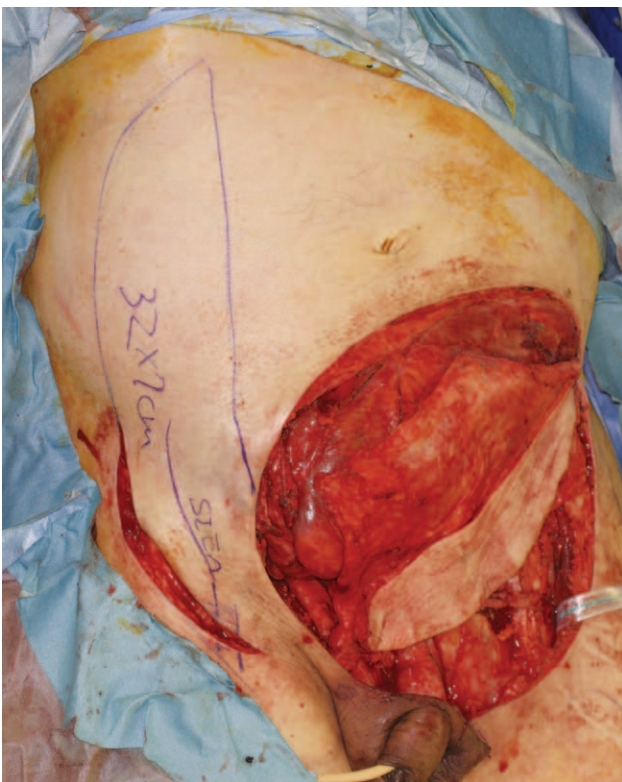


Fig. 2. Intraoperative appearance of the defect after transposition of the anterolateral thigh flap with the iliotibial tract and design of the superficial inferior epigastric artery flap.

is made of robust fascia and is the most suitable biomaterial for this purpose. An iliotibial tract can be harvested to a size as large as $30 \times 20 \text{ cm}^2$; however, the available area of the skin island is smaller than this.⁵ The skin defect in the present case exceeded the upper limit. Donor-site morbidity after ALT flap harvest is reportedly minimal if the donor site can be closed primarily.⁶ Skin grafting on the donor site can significantly limit the range of motion at the hip and knee; however, the maximum width for primary closure of the donor site is reportedly 8 to 10 cm.⁷

To the best of our knowledge, no previously published reports have described the combined use of an ALT flap and an SIEA flap. The SIEA flap is the most suitable flap for use in combination with the ALT flap because the SIEA flap can be harvested with ease. The SIEA flap can cover the farthest side of the defect, which is difficult to cover with the ALT flap because of a limited rotation arc and the small size of the flap. In the present case, the skin continuity of the flap base was preserved because the SIEV was transected during sarcoma resection. If the SIEV is preserved, the flap can be harvested up to the costal arch based on the SIEA and SIEV. Zhou et al.⁸ reported a similar case of successful reconstruction with bilateral ALT flaps; however, we believe that our method is simpler and less time consuming with less donor-site morbidity. Ou et al.⁹ reported reconstruction of a small abdominal wall defect with an SIEA flap; however, defects of limited size can be covered with an SIEA flap alone.

The main drawback of the SIEA flap is the inconsistent anatomy of the SIEA. The SIEA is reportedly deficient

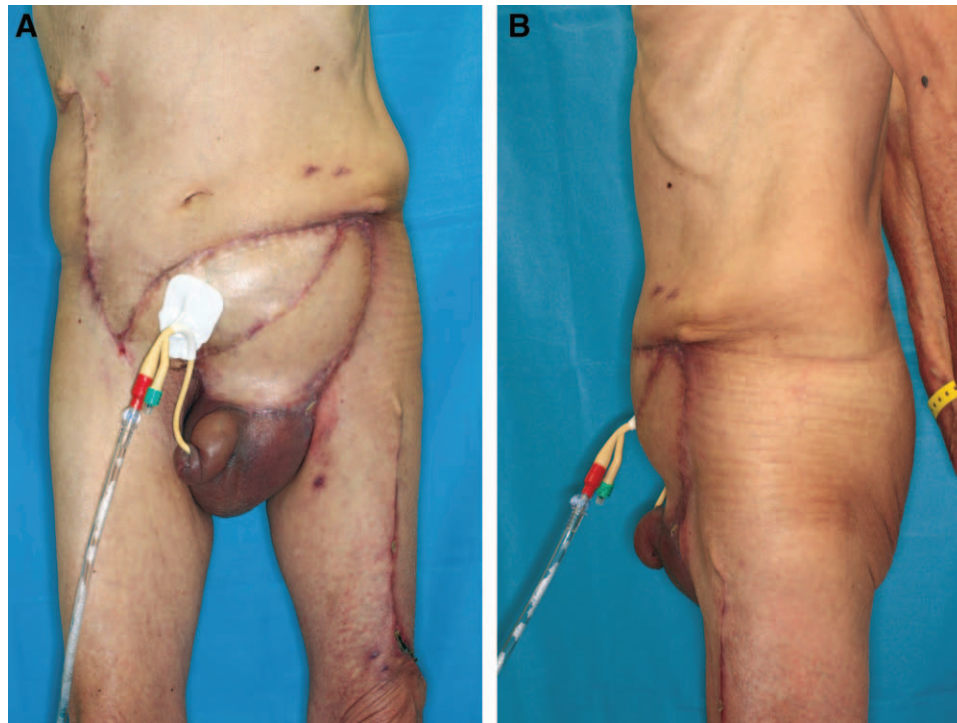


Fig. 4. Two-month postoperative appearance of the patient. Anterior view (A) and lateral view (B).

in about 15% of cases. The presence and diameter of the SIEA should be explored preoperatively with color Doppler sonography or computed tomographic angiography. Another drawback is that the SIEA can be sacrificed during tumor resection. The presence and diameter of the SIEA should be confirmed before entire flap elevation.

In conclusion, we successfully reconstructed an extensive abdominal wall defect after sarcoma resection with the combined use of an ALT flap and an SIEA flap without a skin graft. This combination of flaps may be an option for reconstruction of extensive abdominal wall defects.

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