

DEEP INFERIOR EPIGASTRIC ARTERY PERFORATOR FLAP

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FLAP TERRITORY

The deep inferior epigastric artery perforator flap (DIEP) and superficial inferior epigastric artery (SIEA) flaps are free (fascio-) cutaneous flaps of the lower abdomen below the level of the umbilicus.

VASCULAR ANATOMY

The deep inferior epigastric artery (DIEA) arises from the distal external iliac artery, deep to the inguinal ligament and ascends superomedially towards the umbilicus, behind the rectus abdominis (RA) between the transversalis fascia and the peritoneum. In the majority of cases, the artery enters the muscle at its middle third and in less than 20%, at its lower third. It then usually branches into medial and lateral vessels that give origin to the rows of perforators to the skin. **Figure 1**

The superficial inferior epigastric artery

(SIEA) often arises directly from the common femoral artery or may share a trunk with the superficial circumflex iliac artery (SCIA), 2-5cm below the inguinal ligament. It starts deep to the Scarpa's fascia and as it ascends, pierces the fascia to branch out relatively superficially within the subcutaneous fat. It does not perforate the RA muscle or its fascia. The venae comitantes (VC) to the SIEA are usually very small. A larger separate vein is often found more medial and more superficial.

If large enough, the SIEA can be used to harvest a flap instead of the DIEP but this vessel does not reliably supply tissue across the midline. The SIEA/SIEV can also be used for supercharging or superdraining of the DIEP flap.

FLAP ELEVATION

The patient is positioned supine. The perforators can be localized preoperatively

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with a doppler probe or angiogram and usually lie close to the umbilicus.

The DIEP flap is designed in most cases as an ellipse on the lower abdomen with the upper limit at the superior edge of the umbilicus and the lower limit above the pubic bone. The usual lateral limits are the ASIS. **Figures 2, 3** The donor defect is then closed in the manner of an abdominoplasty.

The contralateral flap is often raised first to get an idea of the position of the linea semilunaris and the larger perforators, however symmetry is not guaranteed.

The inferior skin incision is made with the initial aim of identifying the SIEA and SIEV between the 2 layers of the superficial fascia. **Figure 4**

The superior incision is then made with a periumbilical incision taking care to preserve the umbilical stalk, and the flap

is then elevated at the fascial level from lateral to medial.

Begin to look for perforators once the lateral edge of the rectus muscle is reached. The anterior rectus sheath is incised around the chosen perforator(s) that are traced to the DIEA and its VC that run longitudinally on the deep surface of the rectus muscle. **Figure 5**

Expose the proximal DIEA and VC by retracting the inferior part of the rectus muscle medially. Continue dissecting until a sufficient length of pedicle has been obtained.

Trim the flap according to the requirements. The contralateral side is sacrificed first as it has the poorest vascularity. **Figure 6**

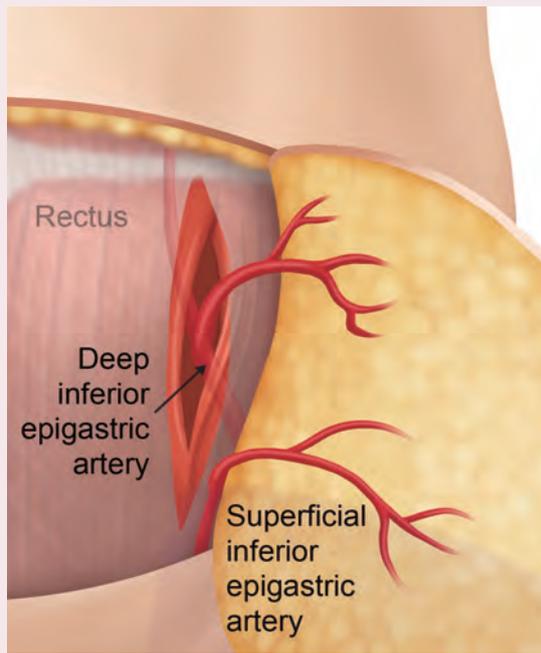


Figure 1
Vascular anatomy of DIEP flap

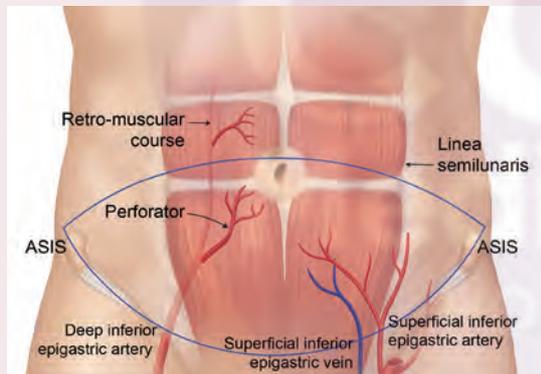


Figure 2
Design of DIEP flap

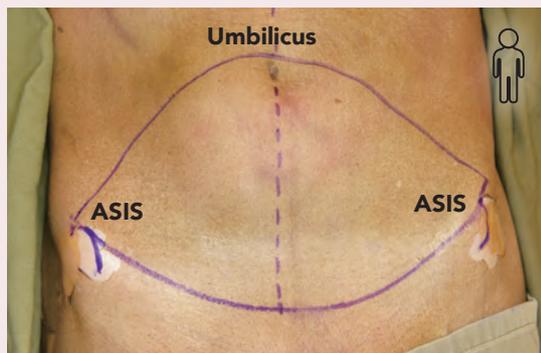


Figure 3
Design of DIEP flap

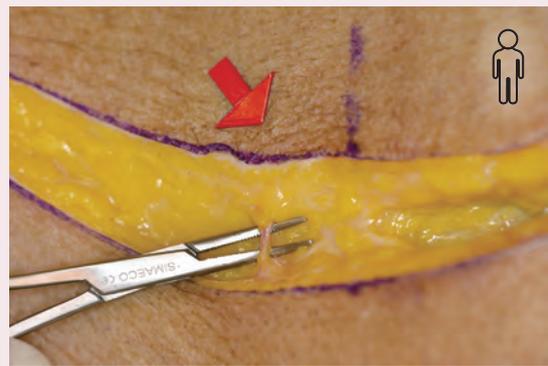


Figure 4
Superficial inferior epigastric artery (SIEA)

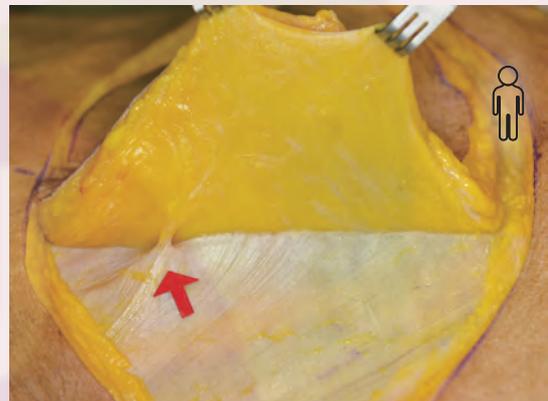


Figure 5
Suprafascial dissection and perforator identified

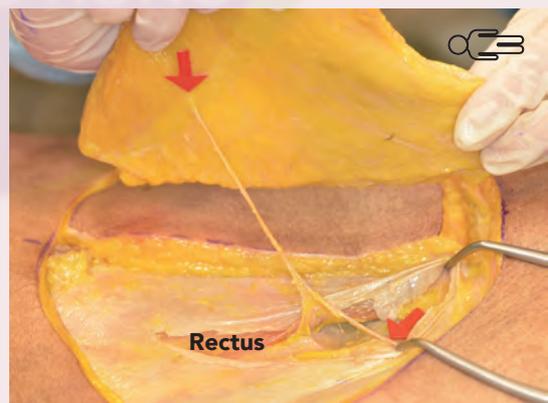


Figure 6
Perforator and DIEA identified and flap isolated

KEY POINTS

1. DIEP is a fasciocutaneous flap supplied by the deep inferior epigastric artery perforator.
2. The DIEP flap is designed as an ellipse on the lower abdomen with its boundaries at the superior edge of the umbilicus, the pubic bone and the ASIS.
3. The inferior skin incision is made first with the aim of identifying the SIEA and SIEV.
4. Begin to look for perforators once the lateral edge of the rectus muscle is reached.
5. Trim the flap according to the requirements. The contralateral side is sacrificed first as it has the poorest vascularity.

