CASE REPORT

Super obesity is not necessarily a contraindication to deep inferior epigastric perforator flap breast reconstruction

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SUMMARY

The deep inferior epigastric perforator (DIEP) flap is widely recognised as a safe and reliable flap for use as a first-choice option in autologous tissue breast reconstruction. Patients with obesity represent a challenging group for autologous breast reconstruction, as they are at increased risk of developing major and minor complications in comparison with patients with normal weight. We report a 59-year-old woman with super obesity, who presented to our department with right breast skin necrosis after implant reconstruction following mastectomy for right breast cancer. After implant removal and local treatment with both surgical debridement and negative pressure wound therapy, the patient successfully underwent a DIEP flap breast reconstruction. We conclude that super obesity should not be a contraindication to DIEP flap breast reconstruction.

BACKGROUND

After its first description in 1989, the deep inferior epigastric perforator (DIEP) flap has found wide application and is now recognised as a safe and reliable flap for use as a first-choice option in autologous tissue breast reconstruction.¹ Patients with obesity represent a challenging group for autologous breast reconstruction, as they are significantly more likely to develop major and minor complications in comparison to patients with normal body mass index (BMI).² As more and more flaps are based on perforators, and as these vessels show significant individual variability, several preoperative vascular mapping tools have been introduced to help their identification.³

Herein, we report a 59-year-old woman with super obesity (BMI ≥ 50 kg/m²), who successfully underwent a DIEP flap breast reconstruction.

CASE PRESENTATION

A 59-year-old woman with super obesity with a history of hypertension, diabetes mellitus type 2, hyperlipoproteinaemia, asthma and osteoporosis was originally diagnosed with a ductal carcinoma of the right breast (pT1a, pN0 (0/1 sn), G2, R0). The patient underwent subcutaneous mastectomy with a sentinel lymph node biopsy, followed by immediate implant reconstruction. One month later, the patient with a BMI of 50.8 kg/m² presented to our department with right breast skin necrosis. The

implant was removed. The infected wound was adequately debrided of all devitalised tissue and a negative pressure wound therapy with a vacuum-assisted closure system was applied. One week later, the option of a flap reconstruction was considered. The patient's main desire was a reconstruction with good aesthetics and function without breast implants. We decided that a DIEP flap reconstruction was preferable, because of its benefits to create a more natural-looking breast and preserve an intact rectus abdominis muscle, avoiding artificial implants. The patient was fully informed about all possible complications (delayed wound healing, scar formation, fat necrosis, seroma formation, partial or total flap loss, donor site morbidity, herniation and so on) and consented.

INVESTIGATIONS

Perforators were localised with colour duplex sonography.

TREATMENT

We proceeded with a right DIEP flap reconstruction. Intraoperatively, multiple perforator vessels were visually identified and carefully prepared. After the recipient vessels, that is, internal mammary vessels, were appropriately exposed, the free flap was transferred to the thorax and a conventional anastomosis in end-to-end fashion between the inferior epigastric vessels and the internal mammary vessels was performed. The flap donor site was closed primarily after partial removal of excess skin and subcutaneous tissue (figure 1A). During surgery, two small hernias were discovered and repaired by a primary suture. The umbilicus was repositioned approximately 2 cm above its original position.

OUTCOME AND FOLLOW-UP

Postoperatively the patient developed a wound infection in the donor area, which required several wound debridements. There was no fat or skin necrosis of the flap with a total follow-up of 3 months and a satisfactory aesthetic result was achieved (figure 1B). Delayed contralateral symmetrisation was recommended, but the patient did not wish to have this done.

DISCUSSION

The DIEP flap as a method of autologous breast reconstruction was introduced in clinical practice

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Figure 1 (A) Intraoperative view (supine position) after unilateral DIEP flap reconstruction in a patient with super obesity with BMI 50.8 kg/m². (B) 6-month postoperative result after unilateral DIEP flap reconstruction (in standing). DIEP, deep inferior epigastric perforator.

by Allen and Treece in 1994.⁴ The flap quickly gained acceptance and recognition worldwide and is now known to be the most commonly performed flap in autologous breast reconstruction during the past two decades.¹ Autologous breast reconstruction in patients with obesity can be challenging, because of technical difficulties and the increased risk of developing complications. For clinical and research purposes, patients with BMI 50–59 kg/m² are classified as super obese and patients with BMI ≥60 kg/m² as super-super obese.⁵

The DIEP flap is based on the deep epigastric inferior artery, which runs superiorly toward the arcuate line after entering the muscle. The most common vascular pattern consists of a simple bifurcation cephalad to the arcuate line, as in our case.⁶ As vascular anatomy presents high variability and not seldom perforators originate from intra-abdominal mesenteric vessels, preoperative vascular mapping serves as an imperative tool to improve the decision-making process. Currently, several methods are available for this purpose, including Doppler and colour duplex sonography, CT angiography, digital subtraction angiography and magnetic resonance angiography.³ Doppler sonography has been found to have a high positive predictive value, when performed with the 10 MHz probe. However, its inability to detect vessels to a depth >20 mm makes the technique less reliable for patients with super obesity.^{3,7} Similarly, colour duplex sonography requires knowledge of free-flap anatomy and it is less reproducible than invasive techniques.³

The association between obesity and complication rates of pedicle-flap breast reconstruction is in the literature well documented.⁸ Patients with obesity have been found to be more likely to develop major and minor complications after autologous breast reconstruction, compared with patients with normal BMI.² Jandali *et al* found morbid obesity (BMI 40–49 kg/m²) to be associated with a higher risk of total flap loss, an increased major postoperative complication rate and delayed wound healing in 25 patients with morbid obesity who underwent 42 free flap breast reconstructions (thereof 7 DIEP flaps in 5 patients).⁹ Despite good flap viability, our patient developed a donor-site related complication. Therefore, it is very important

to discuss with the patient all possible risks and inform her about the increased complication rates of the procedure.

Reviewing the literature to determine the frequency of successfully performed DIEP flaps in patients with super obesity, we found only one similar case reported. Huemer *et al* presented a 44-year-old patient with a BMI of 53.8 kg/m² and a high comorbidity burden suffering from recurrent breast cancer. The preoperatively performed CT scan demonstrated good bilateral DIEP vessels. The patient underwent a bilateral hemi-DIEP flap immediately following simultaneous bilateral mastectomy. The donor site was closed by means of routine abdominoplasty closure, which according to the authors ‘often alleviates many of the problems associated with an overhanging pannus’. At a 4-week follow-up, the patient had a complete flap survival,¹⁰ as our patient.

Learning points

- ▶ Patients with obesity represent a challenging group for autologous breast reconstruction, as they are significantly more likely to develop major and minor complications.
- ▶ Deep inferior epigastric perforator flap breast reconstruction can be successfully performed in patients with super obesity with high comorbidity burden.
- ▶ Preoperative vascular mapping serves as an imperative tool to improve the decision-making process.

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