Immediate simultaneous bilateral breast reconstruction with deep inferior epigastric (DIEP) free flap and transverse rectus abdominis musculocutaneous (TRAM) pedicled flap

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SUMMARY

Breast reconstructive surgery has evolved tremendously since its inception. Following tumour clearance surgery, physical restoration with breast reconstruction is an important aspect of physical and emotional rehabilitation. Various methods have been described to suit patients demand for the best aesthetic outcome. Surgeon's preference, experience and practicality of differing procedures must be considered. We describe a simultaneous bilateral breast reconstruction with free deep inferior epigastric (DIEP) flap and pedicled transverse rectus abdominis musculocutaneous (TRAM) flap immediately post mastectomies for bilateral breast cancers. The surgery described has resulted in a reasonable technical ease, acceptable flap and abdominal morbidity and good aesthetic outcome.

KEY WORDS:

Bilateral breast reconstruction; free flap; pedicled flap; deep inferior epigastric (DIEP) flap; transverse rectus abdominis musculocutaneous (TRAM) flap

INTRODUCTION

The rising awareness of breast cancer screening and genetic testing led to earlier breast cancer detection. Concomitant demand in breast reconstructive surgery (BRS) has to be positively embraced by oncologists and bravely approached by breast surgeons as well as plastic and reconstructive surgeons. BRS may reduce patient's emotional anxiety for fear of expected physical changes following mastectomy. The literature provides countless reports of autologous abdominal tissue flaps with either transverse rectus abdominis musculocutaneous (TRAM) or deep inferior epigastric (DIEP) flap separately. We report a case of simultaneous bilateral breast reconstruction with free DIEP flap and pedicled TRAM flap immediately post mastectomies.

CASE REPORT

A 29-year-old lady with history of breast conserving surgery (BCS) for a Stage one right breast ductal carcinoma, on the background of a positive family history, presented six years later with a new suspicious contralateral breast lesion. Subsequent triple assessment revealed a Stage one ductal carcinoma of the left breast. A multidisciplinary team approach between the oncologists, breast and plastic surgeons led to left mastectomy, left axillary lymph nodes clearance, right mastectomy and immediate free DIEP flap to the left breast and pedicled TRAM flap to the right breast (Figure 1). The breast wound bed defects measured 8 x 10 cm and 7 x 10 cm respectively. Two teams worked consecutively to optimise operative time.

Transverse elliptical skin incision made across the lower abdomen. Skin paddle was raised from the right side for left breast reconstruction with free DIEP flap. Superficial inferior epigastric artery was identified and ligated. Medial row perforators were traced down to the deep inferior epigastric artery and ligated once adequate pedicle length achieved. Free flap transferred to the left breast bed and micro anastomosis to recipient vessels were performed. The superior flap was partially de-epithelialised to create breast mound. For the right breast, pedicled TRAM was raised and tunnelled through subcutaneous pocket at xiphisternum into right breast bed. The flap inset was secured with half buried mattress sutures. The abdominal wall was reinforced with polypropylene onlay mesh, then closed in corresponding layers of Scarpa's fascia, dermal and subcuticular closure.

Post operatively both flaps were healthy and viable (Figure 2). The abdominal wound healed well with no incisional hernia. Following a delayed bilateral nipple reconstruction with inner thigh full thickness skin grafts six months later, patient was satisfied with the outcome. She was advised on contraception while undergoing adjuvant chemotherapy and endocrine therapy for five years in addition to counselling on safety of pregnancy and delivery post TRAM reconstruction.

DISCUSSION

In the 1880s, Czerny attempted breast reconstruction with lipoma transplant to a mastectomy site following a lumpectomy.[1] In 1906 Tanzini manipulated latissimus dorsi

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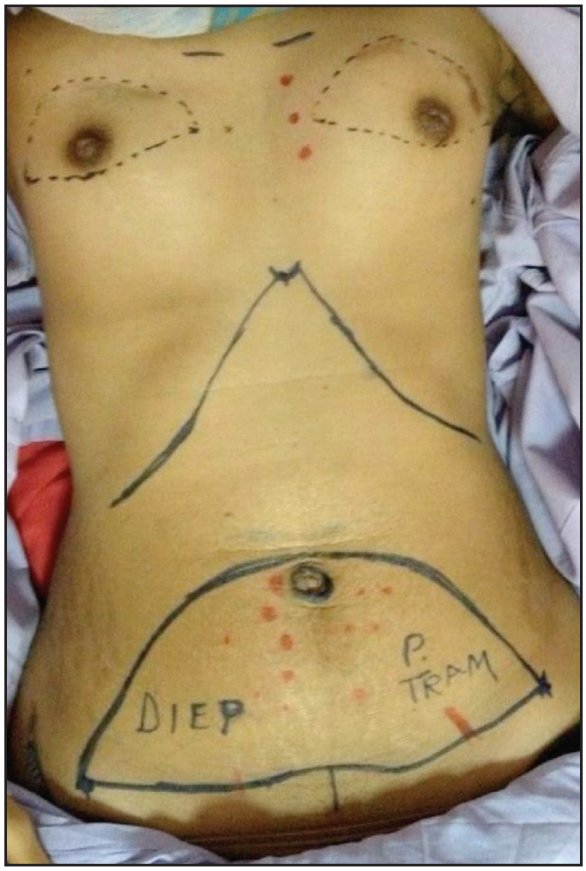

Fig. 1: Pre-operative planning.

Fig. 2: Three months post bilateral breast reconstructions.

muscles to close large mastectomy wounds.[1] The concept of BCS and BRS have evolved tremendously since Halsted's principle of radical mastectomy was questioned in late 20th century.[2] Silicone implants, volume expanders and autologous flap techniques have been refined over decades. In our population, the patients preferred method of BRS is autologous flap.

DIEP and TRAM flaps are abdominal tissue transferred to mastectomy wound beds to reconstruct new breast mounds. Rectus abdominis is segmentally innervated, supplied by the inferior and superior epigastric vessels along with intercostal vessels making it an ideal donor site. The presence of rectus abdominis muscle and the number of perforating vessels differentiate the two flaps. In a TRAM flap, the rectus abdominis muscle incorporated varies from a short length to the entire muscle containing up to six perforators.[3] In contrast, a DIEP flap spares the rectus abdominis muscle with only one to three perforators, preserving the integrity of the abdominal wall3.

Preoperative assessment influences the choice of reconstruction. In a young patient with normal BMI, non-smoker, no comorbidity and no previous abdominal surgery, both TRAM and DIEP flaps are at low risk of perfusion disturbance with good healing potential. History of extensive surgery involving periumbilical perforators such as abdominoplasty is an absolute contraindication for abdominal flaps but where the inferior epigastric vessels are intact both flaps can be used.3 In women with high BMI abdominal flap is discouraged due to risk of fat necrosis from increased vascular demand to the large volume flap.[3]

A DIEP flap suits breast volume less than 1000 ml whereas a TRAM flap is better for greater than 1000 ml.[3] In later reports, volume requirement is no longer a justifying factor for either DIEP or TRAM flap.[3] Although a DIEP flap is able to provide adequate perfusion with one or two good perforators, the reconstruction is at increased risk of flap related morbidity if perfusion is compromised.[3] A minimum of 1.5 mm perforator calibre is required to achieve sufficient perfusion to the flap apart from adequate bleeding from the skin edges.[3] When no reliable perforator is available and the tissue requirement is bigger, a TRAM flap should be considered.

Flap morbidity includes re-exploration within 48 hours, total or partial flap failure, fat necrosis and venous congestion while abdominal morbidity refers to the strength and contour of the donor site. Free flap loss rate can be as low as 2% in the hands of experienced surgeons with similar morbidities and operative times as for pedicled counterparts.[4] Free TRAM complications related to breast and abdomen range up to

13% and 82% respectively.[3] The DIEP flap has higher breast related morbidity up to 62.5% fat necrosis and 4% venous congestion.[4] Abdominal wall strength is preserved by maintaining the lateral intercostal nerves, minimising muscle harvest and preserving vascularity.[3]

Limited cases reported on safety of pregnancy post TRAM reconstruction. The best timing for pregnancy and the mode of delivery; vaginal versus caesarean section, are still debated. According to Hartrampf, the uterine muscle provides major support in pregnancy and aids the contraction in delivery of a new-born while the abdominal muscles are secondary. Thus, a patient post TRAM flap procedure, should be able to carry and vaginally deliver a full-term newborn.[5]

Simultaneous DIEP and TRAM flaps breast reconstruction is a promising option. While maintaining ipsilateral rectus abdominus integrity, the combined technique minimises surgery duration and assures optimal aesthetic outcome.

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