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Bilateral simultaneous breast reconstruction with transverse musculocutaneous gracilis flaps



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KEYWORDS

Transverse musculocutaneous gracilis (TMG) flap; Transverse upper gracilis (TUG) flap; Bilateral breast reconstruction; Prophylactic mastectomy; Microsurgery

Summary *Background:* A transverse musculocutaneous gracilis flap provides good autologous reconstruction for small- and medium-sized breasts. Although the procedure is well adapted for bilateral breast reconstruction, no publication has specifically addressed simultaneous bilateral cases.

Methods: From 2010 to 2014, the authors performed seven simultaneous bilateral breast reconstructions using transverse musculocutaneous gracilis flaps. The results with respect to operative data, immediate complications, second-stage reconstruction, and patient satisfaction after >1 year of follow-up were studied retrospectively.

Results: The mean operative time was 7 h and 48 min (range, 6–9 h). Three minor complications occurred: two cases of limited flap necrosis and one case of donor-site wound dehiscence. Surgical revision was not required, and there was no flap failure. A second-stage operation was performed in 71% of the patients to improve the aesthetic results and flap volume. On average, 167 cm³ of fat was injected per breast. After a mean follow-up of 27 months, the satisfaction rate was 86% without significant functional deficits.

Conclusions: A transverse musculocutaneous gracilis flap is an effective and safe option for simultaneous bilateral reconstruction. The operating time is shorter than that for other autologous procedures with similar complication rates and high patient satisfaction levels.

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Introduction

Several autologous reconstruction procedures are available to provide natural and sustainable breasts after mastectomy. The deep inferior epigastric perforator (DIEP) flap is the most commonly used procedure.¹ However, pedicled latissimus dorsi flaps, gluteal perforator flaps, and transverse musculocutaneous gracilis (TMG) flaps are often preferred, especially when the patient does not have sufficient abdominal skin. The recently developed TMG flap was originally described by Wechselberger and Schoeller in 2004 for breast reconstruction.² Previous studies have shown a high level of patient satisfaction for small- and medium-sized breast reconstructions with low donor-site morbidity.³ The main consistent vascular pedicle of the gracilis muscle provides the blood supply for the flap.⁴ The elliptical transversal skin paddle provides sufficient volume for breast reconstruction with concealed scars in the natural folds. The procedure is particularly well adapted for bilateral breast reconstruction that offers a symmetric aesthetic appearance in the upper inner thigh.⁵ However, no study has yet specifically analyzed the results of simultaneous bilateral cases.

Materials and methods

Between November 2010 and January 2014, 36 patients underwent 44 TMG breast reconstructions performed by the same leading surgeon in our surgical department. Of these, seven cases of primary bilateral simultaneous breast reconstructions were identified and analyzed. Approval to conduct this study was obtained from the ethics committee of the academic hospital, and all patients provided written informed consent.

Patients

The mean age of the patients was 39.4 years (range, 20–48) with a mean body mass index of 25 kg/cm² (range, 18.1–31.6). Mastectomies were performed as curative breast cancer therapy (50%) or prophylactically as skin-sparing mastectomies (50%). The flaps were transferred in the immediate (50%) or delayed setting (50%). Fifty percent of the patients had previously received radiation therapy or chemotherapy. None of the patients presented significant comorbidities, and none of them were active smokers.

Surgical procedure

The surgical procedure was performed as previously described by Schoeller et al.⁵ The TMG flaps were harvested from the inner thigh and transferred to the opposite breast using a systematic double-team approach. The pedicle of the flap was end-to-end anastomosed to the internal thoracic vessels in the third intercostal space. A portion below or above the rib cartilage was removed if necessary. Microanastomoses were performed using hand-sewn 9/0 or 8/0 nylon sutures for the artery and a mechanical coupler device for the veins (Synovis Micro Companies Alliance Inc., St Paul, MN, USA). The skin flap was folded onto itself into a

cone shape and partially deepithelialized. The remaining skin was placed on the major breast surface in delayed breast reconstruction, but was reduced to the areola in immediate breast reconstruction with skin-sparing mastectomy. The gracilis muscle was rolled underneath to increase breast projection.

Retrospective evaluation protocol

Operative data on operative time, ischemic time, weight of the flap, skin paddle dimension, and vascular pedicle characteristics (diameter and length) were studied. The length of hospital stay and immediate complications were collected and analyzed. After 1 year of follow-up, second-stage operations were recorded, focusing on the lipomodeling process and the volume of fat injected in each breast. Patient satisfaction was measured using a four-point Likert scale (very disappointed, disappointed, satisfied, and very satisfied).

Results

On average, the operative time was 7 h 48 min (range, 6–9 h) with an ischemic time of 37 min (range, 26–55 min). The flap characteristics are presented in [Table 1](#). No major complications occurred in the immediate postoperative period. No surgical revisions were required, and no flap failures occurred. The mean postoperative hospital stay was 6.4 days, ranging from 6 to 8 days. Three minor complications occurred after surgery (21% of the reconstructed breasts). One patient had a limited 3-cm² flap necrosis necessitating wound healing for 2 months, and another patient suffered from cytotesteatonecrosis. The third complication, a 5-cm wound dehiscence, occurred at the donor site.

After a mean follow-up period of 27 months, ranging from 12 to 37 months, five women underwent surgery under general anesthesia for a second-step reconstruction (71%). Monitoring of skin excision, flap modeling, nipple areola complex reconstruction, and lipomodeling were the main procedures used. Bilateral fat volume injection was performed on all patients with a mean volume of 167 cm³ per breast (range, 60–260 cm³). Only one woman described a persistent sensation of tightness on the left thigh during forced abduction.

Patient satisfaction regarding the bilateral reconstruction was high, with a satisfaction rate of 86% ([Figures 1–4](#)). Four patients were very satisfied (57%), two were satisfied

Table 1 Operative parameters.

Parameters	Value (min–max)
Operation duration	468 min (360–540)
Ischemic duration	37 min (26–55)
Flap weight	356 g (270–487)
Skin paddle length	22.6 cm (18–30)
Skin paddle width	9.3 cm (7–10)
Artery diameter	2.0 mm (1.5–2)
Coupler size	2.4 mm (1.5–3.5)
Length of TMG vascular pedicle	5.8 cm (4.5–7)

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