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Breast

# An Innovative Autologous Breast Reconstruction Option: Musculo-derma-glandular, Axio-perforator, Bipedicled Flap

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**Summary:** Following a mastectomy, patients frequently seek breast reconstruction. Although there are several options for reconstruction, none of them are considered ideal. Taking patients' psychological and physical condition into account, we created a new flap technique with a low postoperative morbidity and short operation time. We harvested the flap composed of skin, breast tissue, and pectoralis major muscle with a base in the parasternal line from the contralateral breast. To display our results, we presented 2 case examples. The mean follow-up was 12 months, and no postoperative complications were observed. At follow-ups, patients answered the question, "How satisfied are you with the results of the surgery?" using a 5-point Likert-like scale (5, very satisfied; 4, somewhat satisfied; 3, undecided; 2, somewhat dissatisfied; and 1, very dissatisfied). The mean score was 4. Our study showed that this surgical approach is a safe and cost-effective alternative for immediate and delayed breast reconstruction. *(Plast Reconstr Surg Glob Open 2020;8:e3087; doi: 10.1097/GOX.0000000000003087; Published online 25 August 2020.)*

## INTRODUCTION

Mastectomy is a successful surgical option for breast cancer treatment and prevention. This operation can be followed by immediate breast reconstruction (IBR), delayed breast reconstruction (DBR), or no reconstruction. However, patient satisfaction and psychosocial morbidity significantly differ between patients who did or did not have reconstructive surgeries.[1] Various techniques can be used for breast reconstruction. Among them, breast-sharing is a method for patients with hypertrophic breasts. It is one of the lesser known reconstruction methods, which uses part of the healthy breast as a flap. Multi-staged breast-sharing procedures were first performed in the 1940s. Thirty years later, Pontes divided the breast into equal halves vertically and used its medial half for single-stage reconstruction.[2] In this article, a new surgical approach is presented, termed as Musculo-derma-glandular, Axio-perforator, bipedicled (MDG) flap technique. This one-stage technique has minimal complications and favorable scar locations.

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## PATIENTS AND METHODS

Preoperatively, the inframammary sulcus is marked bilaterally while the patient is standing. The sternal, parasternal, and midclavicular lines are drawn. The new location of the nipple–aerolar complex (NAC) and perforators is marked (Fig. 1). To confirm the location of perforators, Doppler is the method of choice. Patients are positioned in the supine position with extended arms similar to the TRAM flap, under general anesthesia. The incision is made with the No. 15 blade, cutting the skin and subcutaneous fat, starting from the right parasternal line to the lateral border of the inframammary sulcus. A similar incision is made 10 cm below the new NAC (Fig. 2). This enables us to keep enough tissue to form the new breast. Cadaveric dissections and angiography showed that the blood supply of this flap is from 2 arteries: 5th, 6th, and 7th perforating branches of the internal mammary artery (IMAPs) and axial-parasternal part of the pectoral branch of the thoracoacromial artery (TAA) (Fig. 3). After cutting the medial part of the IMF, we dissected the pectoralis major and entered the area beneath it. We split the muscle into lateral (contains 2/3) and medial (contains 1/3 of fibers) parts. One should pay attention not to dissect the area between pectoralis major fascia and the breast tissue, as it can damage the vascular structure. After releasing the medial part, we fixed it to the flap with 3-0 Vicryl simple

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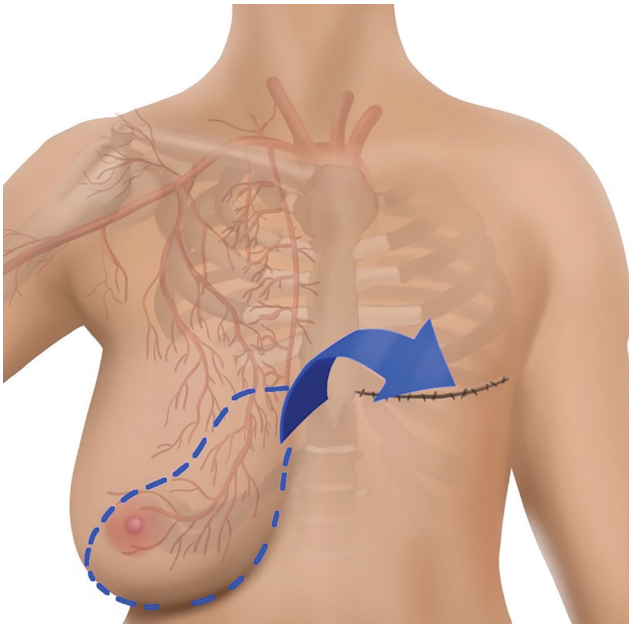

**Fig. 1.** Illustration of preoperative marking of the flap (carrying the NAC) in the patient breast. The blue arrow indicates the direction of the flap rotation.

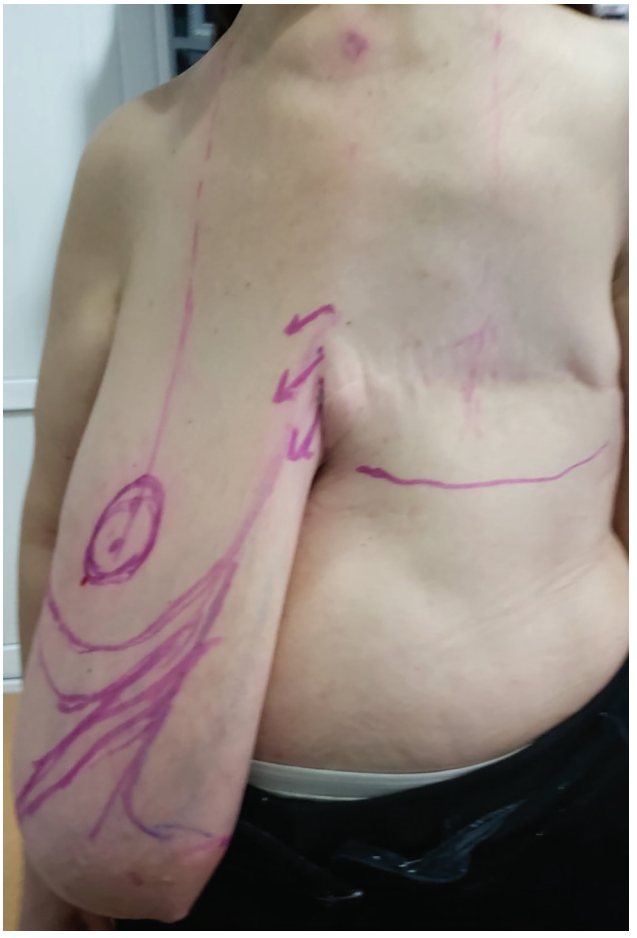

**Fig. 2.** Preoperative photograph of the patient, with markings for the design of the flap (carrying the NAC).

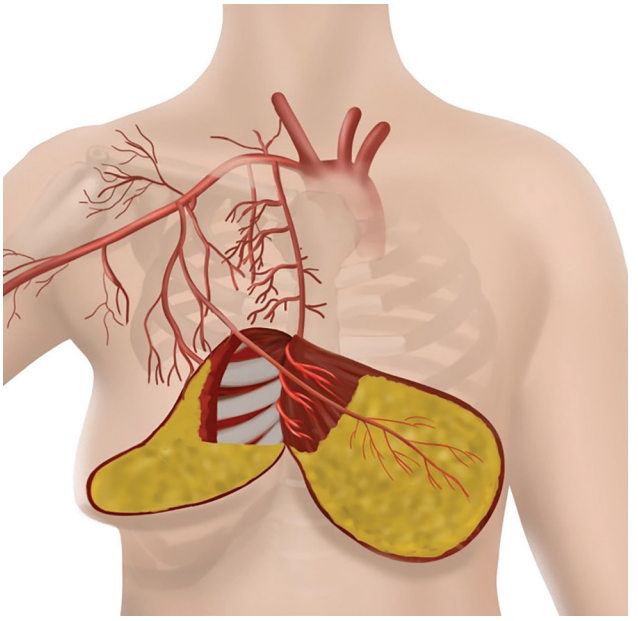

**Fig. 3.** Illustration of flap elevation (note the medial 1/3 fibers of the pectoralis major).

interrupted sutures. The aim is to keep the thoracoacromial artery inside the flap and create the TAA pedicle. Further dissection along with parasternal line through 5th, 6th, and 7th intercostal spaces forms the second pedicle. Dissecting the inferior (adjacent to xiphoid process) and the costal part of the pectoralis major reduces the tension and provides us with the mobility required for transposition. (**See figure 1, Supplemental Digital Content 1**, which displays a) Flap dissection till the pectoralis major muscle. b) The dissection of medial 1/3 of the pectoralis major. c) Thoracoacromial artery (TAA) pedicle preparation. d) Fixation of pectoralis major to the flap with 3-0 vicryl sutures. e) Harvested flap (carrying the NAC) f) Transposition of the flap (carrying the NAC), **http://links.lww.com/PRSGO/B461**.) (**See Video 1 [online]**, which displays shows stages of surgery.) A 3-cm horizontal incision is made over the xiphoid process parallel to the 6th intercostal space, and the tissues are dissected superiorly and inferiorly. (**See figure 2, Supplemental Digital Content 2**, which demonstrates the horizontal incision and the final appearance of the scar, **http://links.lww.com/PRSGO/B462**.) The flap is rotated 180 degrees and transferred into the defect through this opening tunneling (**see Video 2 [online]**, which demonstrates the flap transposition through the tunnel). However, depending on the location of the mastectomy scar, the flap can be rotated between 90 and 180 degrees. The flap is fixed to the borders of the incision made on the mastectomy scar. The horizontal cut is sutured over the flap, which hides the midline bulge. Through an incision at the inframammary sulcus, we dissected tissues till the pectoralis major. Then, we drew the remaining breast tissue medially, and subcutaneous tissues are fixed to the sternal soft tissues with 3-0 vicryl simple interrupted sutures. The skin is cut and arranged to the shape of the new breast.

**Fig. 4.** Postoperative photograph of the patient 5 months after the surgery.

## CASE REPORTS

**Case 1**

A 48-year-old woman presented to our clinic 2.5 years after unilateral mastectomy and adjuvant chemotherapy. The Nipple-Inframammary Fold (N-IMF) and the suprasternal notch-nipple distance were 19 and 42 cm, respectively. The NAC was transferred with the flap. Venous congestion, marginal flap, and fat necrosis were not observed, and her satisfaction score was 4 (Fig. 4).

**Case 2**

A 62-year-old patient presented a year after mastectomy and adjuvant chemotherapy. N-IMF distance was 10 cm. The NAC was not included in the flap design. She had no complications, and her mean satisfaction score was 4. (**See figure 3, Supplemental Digital Content 3**, which demonstrates preoperative and 2 months postoperative photographs, **http://links.lww.com/PRSGO/B463**.) As in case 1, no revision surgery was needed, but she will have a nipple reconstruction with nipple sharing.

## DISCUSSION

Although used less often, the autologous reconstruction is usually considered superior to implant reconstruction owing to higher satisfaction rates and to the absence of device-related problems.[3,4] The Deep Inferior Epigastric Artery Perforator (DIEP) flap is the gold standard, but there is no ideal technique for these patients yet.[5,6]

In 2000, we proposed the Internal Mammary Artery Pedicled (IMAP) fasciocutaneous island flap.[7] Although the 4th perforator is the dominant one, this flap was based on 5th, 6th, and 7th IMA perforators. We avoided creating unaesthetic scar tissue by limiting the vertical incision to these three intercostal spaces. However, it was not suitable to repair large defects.[7] By enhancing the vascular supply, we overcame this limitation.

The new flap allows us to achieve the best skin color, texture, and thickness match. Moreover, by using normally excised tissue as a flap, additional donor site morbidity is avoided. Therefore, postoperative morbidity and surgical trauma are decreased. Similar to the IMAP flap, the position of the scar on the inframammary sulcus hides it.[7,8] As this flap is IMAPs based, it also can be safely used in patients with radionecrosis.[9] Furthermore, the donor site is closed primarily. Patients are discharged on postoperative day 2, which is the direct result of good vascularization of the flap. The flap may or may not carry the NAC. In both cases, secondary surgery will be required for NAC reconstruction. To be a candidate for this surgery, the patient should have a degree 3 ptosis.

This method recreates a natural appearance while having a short surgical time, short hospital stay, and no postsurgical complications. Surgical and functional outcomes were acceptable, and the technique saved time and tissue.

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*Statement of Conformity: The study was performed according to the guidelines of the Helsinki Declaration.*

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