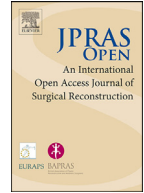




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## Case Report

# The pectoralis major musculo-mammary transposition flap to close a radical mastectomy defect: the breast switch. ☆

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### ABSTRACT

The latissimus dorsi myocutaneous flap is the most commonly used workhorse flap to provide soft tissue closure of large breast amputation defects. When the thoracodorsal vascular pedicle is resected during a mastectomy, local tissue from lateral, contralateral, and inferior regions must be used. In this case report, complete transposition of the contralateral breast based on the pectoralis major muscle and its dominant pedicle was performed to close a massive mastectomy defect up to the anterior axillary line. The donor site defect that resulted at the inferior region was closed with a reverse abdominoplasty flap. A V-Y advancement overlying the ipsilateral latissimus dorsi muscle was advanced to close the lateral defect up to the anterior axillary line, connecting it to the contralateral breast switch.

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## Introduction

Locally advanced and early local recurrent breast cancer continues to be a challenging problem worldwide. When surgery is undertaken, the main goal is to obtain adequate local tumor control that

☆ Prior presentations: None

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**Figure 1.** A massive defect resulted after a wide right radical mastectomy in a 54-year-old patient with an early local recurrent breast carcinoma. The excision of radiated and scarred axilla included the insertion of the latissimus dorsi muscle and its thoracodorsal vascular pedicle.

provides a better quality of remaining life.<sup>1</sup> To provide soft tissue cover skin flaps, muscle flaps or omentum can be used. When regional flaps are inadequate in size or no longer available, microvascular reconstruction may be mandatory. In this case report, an alternative reconstruction was used to close a massive radical mastectomy defect.

### Case report

A 52-year-old obese diabetic patient underwent breast-conserving therapy for invasive ductal carcinoma of the right breast, followed by radiotherapy and chemotherapy. Five out of 15 lymph nodes were positive for metastatic carcinoma. Two years later, she developed an inflammatory carcinoma of the right breast. A tumor was infiltrating the nipple and periareolar skin with ulcerations. The breast was grossly edematous with extensive radiation damage and scarring in the right axilla causing her pain and discomfort. A CT scan revealed no distant metastases. A wide radical mastectomy was performed which left a massive 850 cm<sup>2</sup> defect that extended from the clavicle to the sixth rib and from the sternum to the posterior axillary line (Figure 1). The resection of the scarred and radiated axilla resulted in the excision of the insertion of the latissimus dorsi and its thoracodorsal vascular pedicle. The presence of a vertical lower abdominal scar complicated the use of a rectus myocutaneous flap. An alternative soft tissue reconstruction was performed by using tissue from lateral, contralateral, and inferior regions. A V-Y skin flap over the ipsilateral latissimus dorsi muscle was advanced anteriorly to reduce the lateral defect from the posterior axillary line to the anterior axillary line. The skin along the inframammary fold of the left breast was incised and the pectoralis major muscle was dissected off the sternum and ribs leaving the breast attached to it. A back cut was made from lateral towards the left anterior axillary fold and the insertion of the latissimus dorsi muscle to the humerus was transected. This created a large pectoralis major musculo-mammary flap. This composite flap was transposed switching the entire left breast to the right mastectomy defect (Figure 2). The inframam-



**Figure 2.** The left pectoralis major was raised on its thoracoacromial vascular pedicle with the entire breast attached to it. The pectoralis major musculo-mammary flap is transposed to the contralateral mastectomy defect. A V-Y flap from the back is advanced from the posterior to the anterior axillary line.

mary fold of the transposed left breast was sutured to the V-Y flap and into the right axilla. Careful debulking of the dog ear along the right clavicle was performed preserving any cutaneous vessels or perforators. The inferior donor site defect that resulted was closed by mobilizing the upper abdominal skin down to the umbilicus and advancing it upwards using progressive tension sutures. On the fifth postoperative day, the drains were removed and the patient was discharged. As all irradiated and edematous tissues were excised, no wound healing complications occurred (Figure 3 and 4). Her pain and discomfort were resolved and she received physiotherapy to improve the mobility of the right shoulder. The pathology showed that all resection borders were free of invasive carcinoma. No local recurrences occurred; but 2 years later, she passed away because of disseminated metastatic disease.

## Discussion

Early local recurrence – both after modified radical mastectomy and breast-conserving therapy – indicates a biologically aggressive tumor and carries a poor prognosis. Salvage treatment only cures a limited number of patients.<sup>2</sup> Because inflammatory breast cancer usually develops quickly and spreads aggressively to other parts of the body, generally women diagnosed with this disease do not survive as long as women diagnosed with other types of breast cancer. Palliative surgery to relieve pain, control infection, and tumor ulceration may be justified to attain a better quality of life and symptom palliation. Massive chest wall resection with immediate flap reconstruction is both safe and reliable.<sup>3</sup> Based on factors such as the size of the defect, location on the chest wall, arc of rotation of the flap, and availability of the recipient vessels, an algorithm for chest wall reconstruction can be made.<sup>4</sup> The latissimus dorsi, rectus abdominus, and pectoralis major flaps are the workhorse flaps in chest wall reconstruction.<sup>5</sup> Owing to its large potential size, relatively long pedicle, and robust thoracodorsal vessels, the latissimus is arguably the most versatile flap suited for chest reconstruction. Careful evaluation of the patency of the pedicle should be performed after axillary and lateral thoracic resec-



**Figure 3.** A reverse abdominoplasty was advanced to superior using progressive tension sutures to close the secondary defect. The left breast is completely switched to the right.



**Figure 4.** The pectoralis musculo-mammary flap can reach the contralateral anterior axillary line. It was sutured to the V-Y advancement flap from the back.

tions. When compromised, as in our case, the surgical plan must be altered. Early on in the surgical treatment of recurrent breast carcinoma, breast sharing techniques using the contralateral breast have been used to close soft tissue chest defects. Superior- or inferior-based breast flap designs can be used as a rotation or transposition flap.<sup>6</sup> Breast flap techniques have in common that their size and reach are limited and dependent on the size of the breast. A Cyclops breast deformity would result if the breast as a whole is mobilized towards the contralateral chest. Moreover, its circulation becomes precarious and unpredictable when the flaps are excessively mobilized to reach contralateral defects. The thoracoacromial trunk with its pectoral artery provides the dominant blood supply to the pectoralis major muscle. The major supply to the skin from the pectoral artery is the fasciocutaneous branches which appear laterally along the free lower border of the muscle. Medially and inferiorly, around the borders of the muscle and onto the rectus sheath, the skin is not supplied directly by the pectoral artery; but indirectly by cutaneous branches arising from the internal mammary/superior epigastric system. These areas are secured by arterial connections with the pectoral artery, which occur primarily in the pectoralis major muscle.<sup>7</sup> From fixed skin zones, the dominant perforators radiate over the loose skinned areas to form a rich horizontal network which is well developed over the bulk of the pectoralis major muscle, specifically in females.<sup>8</sup> Therefore, the cutaneous territory of the pectoralis major lies between the parasternal line and the anterior axillary line and extends from the clavicle to the sixth intercostal space.<sup>9</sup> The entire breast can thus be transposed on the pectoralis major muscle based on the thoracoacromial trunk to the contralateral chest. The secondary inferior defect can be closed with a reverse abdominoplasty, which is simple and safe.<sup>10</sup>

## Conclusion

The choice of technique to close a postmastectomy defect depends on the size and extent of the defect, its location, and donor site availability with consideration to previous thoracic or abdominal surgeries. The reconstructive surgeon should have a wide spectrum of techniques in his or her armamentarium and be ready to alter the preoperative plan based on intraoperative findings. When a mastectomy defect is massive, multiple flaps should be considered that come from lateral, contralateral, and inferior regions. The pectoralis major musculo-mammary transposition flap can reach the contralateral anterior chest to the anterior axillary line, axilla, and clavicle. The breast switch is a viable salvage option in selected cases.

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## Declaration of competing interest

The authors declare no conflict of interest.

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## Ethical approval

For this type of article, formal consent from a local ethics committee is not required.

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