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10.2478/AMB-2025-0017

CASE REPORT

A RECTUS ABDOMINIS MUSCLE FLAP FOR CHEST WALL RESECTION AND RECONSTRUCTION FOR MALIGNANT BREAST CANCER RELAPSE

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Abstract. *Reconstruction of postoperative chest wall defects with a rectus abdominis muscle flap is a relatively rare technique. We present a case of a 78-year-old woman who was operated 11 years ago for solid papillary carcinoma of the left mammary gland with ipsilateral axillary lymph node dissection, after which she underwent two operations for local relapse. Because of a new relapse, resection and reconstruction of the chest wall with polypropylene mesh and the right rectus abdominis muscle were performed.*

Key words: *musculus rectus abdominis flap, chest wall resection and reconstruction*

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Received: *04 August 2024;* ***Revised:*** *19 August 2024;* ***Accepted:*** *21 August 2024*

INTRODUCTION

Full-thickened defects of the chest wall should be reconstructed using stabilization and soft tissue covering [1]. It is mandatory for maintaining the normal respiratory function of the chest wall and protection of the intrathoracic organs. Reconstruction of postoperative chest wall defects with a rectus abdominis muscle flap is a relatively rare technique. This type of reconstruction is suitable for anterior and anterolateral chest wall defects, both for oncological reasons and for patients who have undergone radiotherapy or trauma.

CLINICAL CASE PRESENTATION

We present a 78-year-old woman who underwent surgery 11 years ago at another institution for solid papillary carcinoma of the left mammary gland with ipsilateral axillary lymph node dissection. She received tamoxifen therapy for 4 years. In the same year, a local recurrence occurred, which was removed at the same institution, and the patient underwent radiotherapy with 50 Gy and started treatment with the estrogen blocker fulvestrant for 6 years. One year after the removal of the local recurrence, a second one appeared in the area of the postoperative scar, which was again treated with excision, and tamoxifen therapy was resumed. Currently, a compacted lesion 15-20 mm located in the postoperative cicatrix at the level of the 4th rib is noted.

Chest CT shows a dense nodular structure measuring 13/9 mm at the level of the 4th rib on the left which is confirmed on PET/CT (Fig. 1). There is no data for distant dissemination.

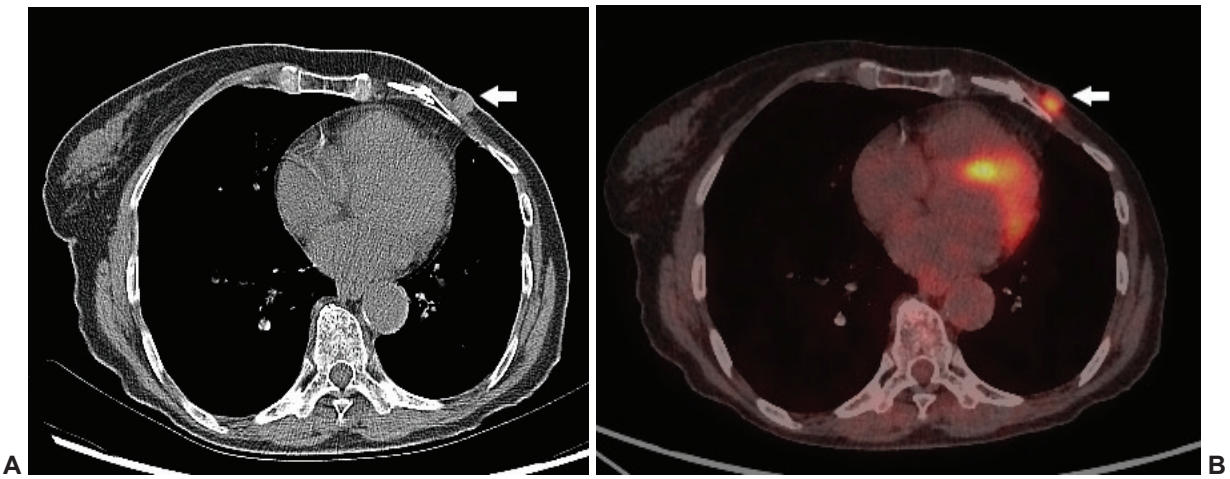


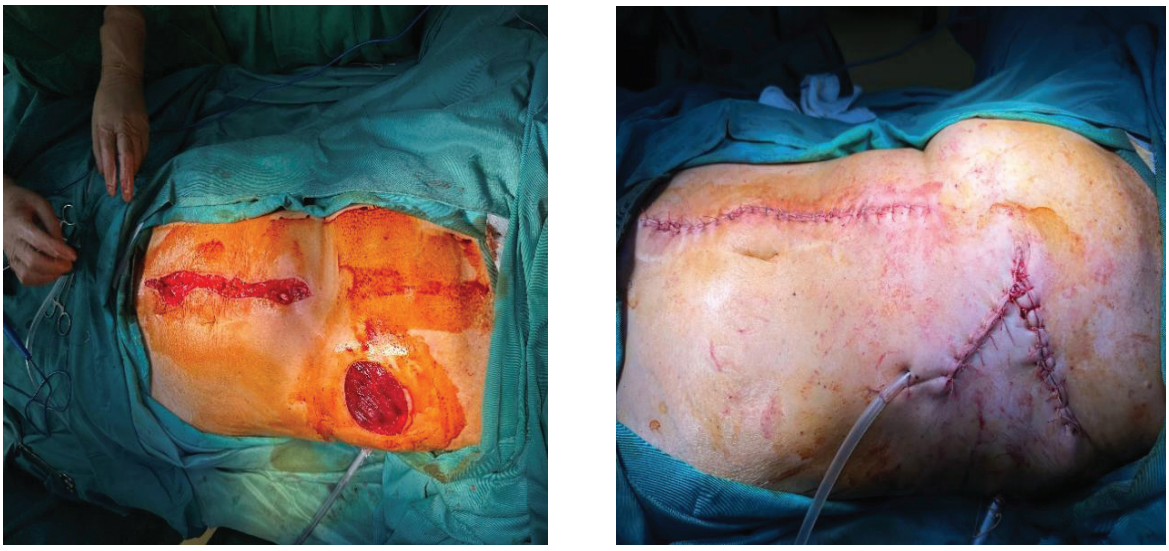
Fig. 1. CT (**A**) and PET/CT (**B**) showing local relapse

Under general intubation anesthesia with a Robert-Shaw tube, an elliptical skin incision was performed at approximately 4 cm laterally to a tight-elastic lesion on the left chest wall. The last one was with size 15/10 mm. The incision was deepened, the ventral segment of the fourth left rib was resected because of the intimate adjacency of the lesion to its periosteum, together with the surrounding intercostal muscles and neurovascular bundles, and the left fourth sternocostal joint was medially disarticulated. The left mammary artery and its accompanying veins were ligated and severed. The resulting defect of about 6 cm2 was closed with a polypropylene mesh and pericostal sutures (Fig. 2). A catheter was placed in the left pleural cavity on active aspiration. With a vertical longitudinal incision over the right rectus abdominis muscle and incising its aponeurosis, the latter was sharply dissected (Fig. 3) and the epigastric artery and its two accompanying veins near the pubis were transected. The distal part of the right rectus abdominis muscle was also transected there. A subcutaneous tunnel was carried out, and the last with nutrient vessel, the right superior epigastric artery, was pulled up and placed over the mesh (Fig. 3). A transverse branch of the skin was performed at the lower pole of the wound and the last was closed by placing a tube catheter subcutaneously over the flap. The aponeurosis, subcutaneous tissue and skin of the donor site were closed (Fig. 4). The pleural catheter was removed on postoperative day 4, and the chest wall catheter was removed on postoperative day 7.

Fig. 2. Intraoperative view of the chest wall defect after resection (A) and placement of the synthetic mesh (B)

A B

Fig. 3. (**A**) Harvesting by sharp dissection and (**B**) transfer of the mobilized right rectus abdominis muscle through a subcutaneous tunnel and placing it on the synthetic mesh



A B

Fig. 4. View before (**A**) and after skin closure (**B**)

The patient was discharged uneventfully on the 10th postoperative day.

DISCUSSION

The integrity and stability of the chest wall ensure protection of the intrathoracic organs as well as normal respiratory function [2]. Chest wall stability is provided by prosthetic or bioprosthetic materials or a combination of both [3]. Subsequent soft tissue reconstruction could be accomplished by rotation of vital thoracic or extrathoracic muscle flaps, free flaps, or omentum. A flap of rectus abdominis muscle could be constructed on both the inferior and superior epigastric arteries. Lengthening of the pedicle of the blood supply vessel could be achieved by resection of segments of the lower costal cartilages [4]. This flap is used to cover anterior and lateral chest wall defects, post-sternotomy dehiscences due to sternomediastinitis, and mammary reconstructions. The use of this type of flap may be compromised if the mammary artery is resected during tumor extirpation [5]. In the presented case the ipsilateral mammary artery was also ligated, but we used the contralateral rectus abdominis muscle. Prior aorto-coronary bypass surgery using the mammary artery for grafting, as well as previous transrectal vertical or transverse laparotomies could also be a contraindication to the

use of the rectus abdominis muscle. Due to previous operations for two local recurrences and the appearance of a third one, which lies close to the periosteum of the 4th rib, the ventral segment of the latter with the adjacent soft tissues was also resected, resulting in a full-thickened chest wall defect. The patient's previous laparotomy for small bowel obstruction and resection, along with the uncertain status of the omentum did not justify the risk of a possible new laparotomy and use of an omental flap. The partial resection of the left pectoralis major muscle in the previous two recurrence interventions also precluded its use, so we decided to cover the placed polypropylene mesh with the right rectus abdominis muscle.

CONCLUSIONS

Soft-tissue chest wall reconstruction with the rectus abdominis muscle, especially in the anterolateral regions, has excellent early and late postoperative results. This technique is especially suitable when the omentum or pectoral muscle cannot be used.

Conflict of Interest Statement: *The authors declare no conflicts of interest related to this work.*

Funding: *The authors did not receive any financial support from any organization for this research work.*

Informed Consent for a Clinical Case: *Written informed consent was obtained from the patient for the publication of this case report, including any accompanying images.*

Ethical statement: *This study has been performed in accordance with the ethical standards as laid down in the Declaration of Helsinki.*

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