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CASE REPORT

Breast

Repair of Breast Defect by Transfer of a Contralateral Internal Mammary Artery Perforator Flap

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Summary: This is a case report of a patient with a borderline phyllodes tumor in the left breast. Seventeen months after the resection of the phyllodes tumor from the patient's left breast, the tumor occurred again 5 months ago in the surgical region. A large defect was generated after the extended resection of the left breast mass, and it was repaired with a contralateral internal mammary artery perforator flap. After the operation, bilateral breast symmetry was good, and the patient was satisfied with the shape of the breast. Postoperative follow-up was performed for 15 months, and no local recurrence was observed. *(Plast Reconstr Surg Glob Open 2022;10:e4014; doi: 10.1097/GOX.0000000000004014; Published online 12 January 2022.)*

Phyllodes tumor of the breast is a rare fibroepithelial tumor that accounts for 0.3%–1% of all tumors.[1] Surgical resection is the main treatment, and lumpectomy with a resection margin greater than 1 cm can usually reduce the risk of local recurrence.[2] Although the incidence of local recurrence is high in breast-conserving surgery, studies have shown that there is no difference between breast-conserving surgery and mastectomy in terms of metastasis-free survival or overall survival.[3] After extended local resection of the tumor, a large area of defect can occur, and the repair of this defect is an issue to be addressed.

The internal mammary artery emanates anterior intercostal branches and perforators in the first to sixth intercostal spaces, and the main perforators (with a diameter greater than 1.5 mm) are easily found 2–7 cm from the medial side in the third and fourth intercostal spaces.[4] The internal mammary artery perforators and the lateral thoracic artery perforators anastomose with each other in the breast parenchyma and behind the nipple–areola complex, forming an arterial network. Some scholars have reported that immediate or delayed breast reconstruction can be performed by using the contralateral internal mammary artery perforator flap to repair wound defects after mastectomy.[5] This case report describes the successful repair of the defect after a partial mastectomy using a contralateral internal mammary artery perforator flap.

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CASE REPORT

The patient in this case was a 28-year-old woman. Seventeen months after the resection of a phyllodes tumor from her left breast, a mass approximately 2 × 2 cm in size reappeared in the surgical area 5 months ago. It was not treated at that time due to pregnancy. The mass grew over time, and the patient came to the hospital for treatment at 1 month after delivery. The examination at admission showed a palpable mass beside the nipple in the medial upper 9–12 o'clock quadrant of the left breast, with a size of approximately 7 × 7 cm and a tough texture (Fig. 1). The mass had a good range of motion and mild tenderness. Color Doppler ultrasound examination of the breast showed multiple lobulated hypoechoic nodules in the medial upper quadrant of the left breast with a size of 5 × 4 cm. Chest CTA showed good morphology of the internal mammary artery. The clinical diagnosis of the left breast mass was possible phyllodes tumor. The surgical plan was as follows: extended resection of the left breast mass under general anesthesia and defect repair by contralateral internal mammary artery perforator flap transfer through a subcutaneous tunnel (Fig. 2). The specific operation was as follows: A double-ring incision was made on the left breast, a 2 cm-wide ring of the epidermis outside the areola was removed, the dermis and subcutaneous tissue were incised along the side of the outer ring, and then the intact capsule and the clear boundary of the mass were observed. The tumor was completely removed by incising at least 2 cm from the edge of the mass. A double-ring incision was made on the right breast to cut it open. At the preoperatively marked accessory perforating branches of the right internal mammary vessel, a fan-shaped incision was made to open the glandular tissue in the upper inner quadrant. A thick internal mammary vessel perforating branch was found near the parasternal region and was protected. This forms the pedicle, in a rectangular area of 1 cm wide and 3 cm long subcutaneously (Fig. 3). A subcutaneous tunnel between the left and right breasts was established nearby.

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Fig. 1. The patient at admission.

Fat excess around the pedicle or in the subcutaneous tunnel was removed for cosmetic result. The right vascularized pedicled flap was transferred to the left breast defect, and the remaining glands on both sides were dissected slightly from the surrounding skin to mobilize for shaping and were sutured.

The internal mammary flap was evaluated according to the volume of the resected specimen, which was 18 × 12 × 3 cm, or around 280 g. To achieve symmetry, around half of the volume was needed, which was 9 × 6 × 1.5 cm and determined the amount of the internal mammary flap to be transferred.

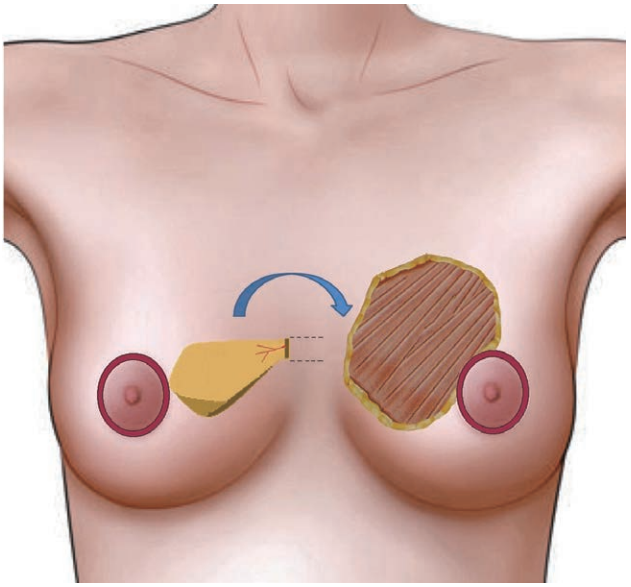

Fig. 2. The mass in the left breast was removed completely, with the main perforator of internal mammary vessel in the center. A pedicle was formed in a rectangular area of 1 cm wide and 3 cm long subcutaneously (dark color marking in iconographies).

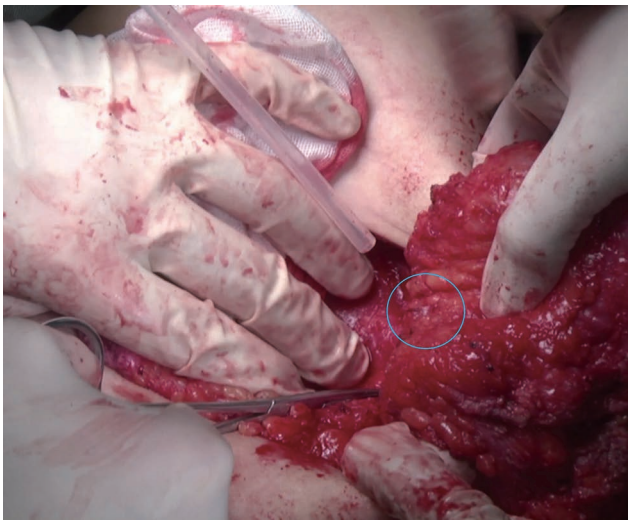

Fig. 3. Right internal mammary artery perforator flap harvesting during surgery.

A postoperative pathology report showed a borderline phyllodes tumor of the left breast. There were no complications of the patient's wound. There was no local recurrence during the 15 months of follow-up. The bilateral breast symmetry was good, and the patient was satisfied with the shape of the breasts (Fig. 4).

DISCUSSION

Large breast defects can occur after the extended resection of a large phyllodes tumor of the breast or breast-conserving surgery for locally advanced breast cancer, and bilateral breast asymmetry can occur after direct suturing, which can affect the patient's appearance. Autologous tissue can be used for repair, and the most frequently used donor sites for autologous tissue for reconstruction are on the abdomen,

Fig. 4. Photograph of the patient at fifteen months postoperative.

including transverse rectus abdominis myocutaneous flaps,[6] deep inferior epigastric perforator flaps,[7] and superficial inferior epigastric artery flaps.[8] When abdominal sites are not suitable, options can include a latissimus dorsi flap[9] or a gluteus maximus flap.[10] However, these flaps need to be transferred from a distant area to the breast and can result in donor site injuries and a long postoperative recovery time. Abdominal wall weakness or even abdominal wall hernia may occur after transverse rectus abdominis myocutaneous flap surgery,[11] and seroma may occur after latissimus dorsi flap surgery.[12]

In the case reported here, after a sufficient margin of safe tumor resection was ensured, a contralateral internal mammary artery perforator flap was used. This flap allows the size of the contralateral breast to be reduced, and the flap can be transferred through a subcutaneous tunnel to the defect site after tumor resection to achieve the triple goals of extended tumor resection, defect repair, and symmetrical reduction of both breasts. The double-ring incision minimizes surgical scarring. In the present case, the avoidance of a distant flap significantly shortened the operation time and reduced the surgical risk. The key to the operation was the intraoperative protection of the internal mammary artery perforator. Preoperative computed tomography angiography images and body surface marking of the blood vessels were very helpful. This surgical method is applicable in cases of large breast volume and when it is necessary to repair the defect in the inner quadrant of the breast after unilateral tumor resection. However, the follow-up time of this case was short, and studies with a long follow-up time and large sample size are needed to determine the efficacy and safety of this method.

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