Special therapeutic problems in benign breast conditions

Benign proliferative breast lesions are most frequently observed in women 30 to 40 years of age, sometimes causing significant breast asymmetry because of the large size. The differential diagnoses for these lesions include pseudoangiomatous stromal hyperplasia (PASH), benign phyllodes tumors, juvenile fibroadenoma, and giant fibroadenoma with increased stromal cellularity. The principles of surgical treatment are different for each diagnostic category. The crucial steps in management consist of preoperative tissue diagnosis and surgical techniques for breast reconstruction after removal of the tumor.

Core needle biopsy (CNB) is preferable to fine needle aspiration for preoperative tissue diagnosis, because fibroadenomas and phyllodes tumors have similar cytologic features. Clinical findings that could increase the suspicion of phyllodes tumors include older patient age, larger tumor size, and history of rapid growth (1). The major pathological feature that distinguishes a phyllodes tumor from a giant fibroadenoma is the cellularity of the stromal component in the former (2). However, the histologic features of benign phyllodes tumors can be difficult to distinguish from those of fibroadenomas on CNB.

It is common for a CNB of either a phyllodes tumor or fibroadenoma to be interpreted as a “fibroepithelial lesion”, hence a phyllodes tumor cannot be ruled out in such a situation. The clinical challenge for the surgeon is to decide whether to remove the entire lesion for management, as is done for a typical fibroadenoma, or to excise the lesion with wide margins, as is therapeutically indicated for phyllodes tumors. If large benign phyllodes tumors are excised with narrow or no margin, reexcision should be performed. Several publications advocated margins of at least 1 cm as adequate (3,4).
Appropriate techniques for breast reconstruction are crucial after removal of a large benign tumor. Lesions with microscopic appearance of a conventional fibroadenoma, however large, should still be classified as fibroadenomas and may be managed adequately by enucleation. Cosmetic sequelae after enucleation of large tumors are common. If an estimated 20% to 50% of breast volume has been resection, a type II breast deformity can occur. Reshaping the breast by using a “round block” technique such as the periareolar Benelli mastopexy is required to correct the defect after removing a large volume of the tumor (Figure 1A-C) (6). If total mastectomy is considered for a large benign phyllodes tumor, then a free flap or a pedicled flap such as a pedicled transverse rectus abdominis (TRAM) flap can be used to reconstruct the breast (Figure 2A,B).

**Special therapeutic problems in malignant conditions**

In patients with a CNB result interpreted as “malignant phyllodes tumor”, the crucial information is whether the tumor to breast size ratio is favourable (e.g., a low ratio) or not. A pseudocapsule of dense, compressed, normal tissue, often containing microscopic malignant cells, surrounds malignant phyllodes tumors. As a result, more tissue typically needs to be removed to achieve adequate margins (7). Simple mastectomy without axillary dissection has been recommended for malignant phyllodes tumors with high tumor to breast size ratio. Margins can be typically wider than 1 cm, but a width greater than 2 cm is associated with the lowest risk of recurrence (8). After removing the tumor with negative margins, a large skin and soft tissue defect can be covered with a pedicled TRAM flap reconstruction (Figure 3A-D). In a patient who presented with local recurrence (LR) after performing left breast conservative treatment (BCT) for a malignant phyllodes tumor, and who also had large breasts with severe ptosis, we performed a restaging work-up to rule out distant metastases. The majority of such patients with LR after BCT are treated with mastectomy, although the use of repeat breast conservation surgery for LR has been reported (9). In the case of our patient, after a restaging work up ruled out distant metastasis, we performed a left mastectomy, and a reduction mammoplasty of the opposite breast to reduce breast weight, with a good cosmetic result (Figure 4A,B) (10). A reduction mammoplasty in the present setting can help relieve back pain and achieve good body balance, with only one remaining but smaller breast.

**Special therapeutic problems in the palliative setting**

Breast cancer patients who have concurrent distant metastases (stage IV disease) are primarily treated by palliative systemic therapy. Surgical removal of the breast tumor does not provide survival benefit. On occasion the primary tumor is removed in these patients for palliative reasons, such as for...
Figure 2 Presentation and resection of a large benign phyllodes tumor. A 39-year-old woman presented with a large mass in the left breast. Core needle biopsy (CNB) was reported as “benign phyllodes tumor”. (A) Preoperative presentation with bulging mass apparent on inspection; (B) postoperative view after performing a pedicled transverse rectus abdominis (TRAM) flap.

Figure 3 Presentation and management of a malignant phyllodes tumor. A 44-year-old woman presented with a large mass in the left breast. CNB was reported as “malignant phyllodes tumor”. (A) Preoperative presentation with a bulging mass apparent on inspection; (B) intraoperative view after simple mastectomy with 3 cm lateral margins of surrounding soft tissue; (C) the defect was covered with a pedicled TRAM flap; (D) postoperative view 2 weeks after surgery. CNB, core needle biopsy; TRAM, transverse rectus abdominis.
disabling pain, infection, ulceration or bleeding. Nonetheless, these patients should be initiated on systemic therapy as the first-line treatment. Patients who respond to systemic therapy, or have persistent but non-progressive metastatic diseases, with good performance status, may be considered for palliative or salvage surgery for quality of life (QoL) reasons. The QoL benefits have been highlighted in a recent study (11). A salvage resection is defined as the resection of all visible lesions, extending to the surrounding skin with a safety margin of at least 2 cm (12). Closure or reconstruction of the soft tissue defect of the chest wall can be performed using skin grafts or different types of vascularized pedicled musculo-cutaneous flaps.

The choice of closure or reconstruction methods depend on the location and size of the defect, availability of the local and pedicled flaps, previous surgery or radiotherapy at the donor and recipient site, and the general condition of the patient. Direct simple closure is possible for small lesions. Skin grafts can be used for superficial chest wall defects involving only the soft tissue. Previous or post-operative radiation therapy may compromise the healing of skin grafts.

**Local flaps**

**Breast flap**

The breast parenchyma can be used as a flap to cover defects located predominantly in the midline (Figure 5A-D). This flap is suitable for elderly patients with associated comorbidities, because of the short operative time required. The blood supply of breast flap is good, but the cosmetic outcome is rather poor (13).

**Random skin flap from the lateral chest wall**

This flap can cover small and moderate sized defect on the anterior and lateral aspects of the chest wall, and can be used in combination with the other flaps (Figure 6A-E). It is also suitable for the elderly, or for patients with poor functional status, due to the short operative time. The weakness of this method is a lack of sufficient volume to cover large defect.

**Pedicled flaps**

The regional pedicled musculocutaneous flaps available for reconstruction include the latissimus dorsi (LD) flap or TRAM flap. We prefer the use of the LD flap when available, and it is usually large enough to cover most defects (Figure 7A,B). The LD flap can be rotated widely, is easy to harvest, and can be tailored to cover the anterior, lateral, and posterior regions of the chest wall. In addition, this technique can be performed within a relatively short period of time, and patients experience fewer postoperative complications afterwards.
Complications of oncoplastic surgery after radiation

Previous studies suggested that the surgeon should be more cautious in performing oncoplastic surgery in patients with irradiated breasts. The study by Losken et al. suggested that radiation therapy might decrease compliance of the covering soft tissue (14). Our results demonstrate that oncoplastic surgery is a simple and reliable technique to correct nipple areola complex (NAC) malposition after previous breast procedures, even in those patients who previously underwent locoregional radiotherapy that could negatively affect wound healing and graft intake (15).

In previously irradiated patient, our experience showed a mastectomy skin flap necrosis occurred after performing nipple sparing mastectomy (NSM) with LD flap plus implant reconstruction (Figure 8A-D). This finding may due to the individual surgeon’s technique. The surgeon must carefully make the dissection of the gland more precisely and the preservation of the subdermal vessel network to the cutaneous flaps. To reduce severity of necrotic complications, the reconstruction should be performed with autologous flap (LD flap, TRAM flap) with the use of an additional implant. When mastectomy skin flap or NAC necrosis occurred, we sometimes performed only skin flap debridement with or without NAC and we did not remove implant because the flap could protect and cover it.

Conclusions

Breast reconstruction techniques are of crucial importance after removal of large benign proliferative lesions with an adequate margin. For large phyllodes tumors, oncoplastic surgery can

Figure 5 Presentation and management of invasive ductal carcinoma at left breast with stable bone metastasis. A 65-year-old woman presented with a large mass at the left breast. CNB was reported as “invasive ductal carcinoma”. An assessment for metastatic disease showed no lesion on computed tomography of the chest and abdomen, but multiple bone metastases were found on radionuclide scintigraphy. She received systemic endocrine therapy and her bone metastases stabilized. (A) Preoperative presentation with large mass apparent on left breast; (B) intraoperative view of medial chest wall defect after salvage mastectomy; (C) the defect was covered with a right breast flap; (D) anterior view of the results at 6 weeks after performing right breast flap. CNB, core needle biopsy.
Figure 6 Presentation and management of invasive ductal carcinoma at left breast with stable bone metastasis. A 60-year-old woman presented with a large mass at the left breast. CNB was reported as “invasive ductal carcinoma”. An assessment for metastatic disease showed no lesion on computed tomography of the chest and abdomen, but bone metastases were found on radionuclide scintigraphy. She received systemic therapy for stage IV disease until her bone metastases stabilized. The large tumor was partially responsive to systemic treatment. The patient requested tumor removal because of pain. (A) Preoperative presentation with large mass apparent at left breast; (B) intraoperative view of the chest wall defect after salvage mastectomy; (C) the defect was covered with a random skin flap from lateral chest wall; (D) anterior view of the results at 6 weeks after surgery; (E) lateral view of the results at 6 weeks after surgery. CNB, core needle biopsy.

Figure 7 Presentation and management of invasive ductal carcinoma at right breast with stable bone metastasis. A 64-year-old woman presented with a tumor at the right breast. Skin involvement can be seen. CNB was reported as “invasive ductal carcinoma”. An assessment for metastatic disease showed no lesion on computed tomography of the chest and abdomen, but bone metastases was found on radionuclide scintigraphy. She received systemic endocrine therapy until bone metastases were stabilized. (A) Preoperative presentation with skin involvement; (B) anterior view of the results at 6 weeks after performing right LD flap closure of defect. CNB, core needle biopsy; LD, latissimus dorsi.
prevent and correct breast deformities after adequate removal with wide margins, resulting in a good cosmetic outcome. Larger soft tissue and skin defects can be closed using oncoplastic methods. Salvage mastectomy and reconstruction for stage IV breast cancer is a feasible procedure, providing adequate local disease control and excellent palliation of very disabling symptoms in selected patients.

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Footnote

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References


