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Salvage (tertiary) breast reconstruction after implant failure

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Summary *Background:* Salvage breast reconstruction is defined as a complete revision of a previous reconstruction in case of unsatisfactory results or failure of primary or secondary breast reconstruction. We have termed this 'tertiary breast reconstruction'. This article presents our experience with tertiary reconstructions, including the indications, method of reconstruction and outcomes.
Methods: A retrospective note review was performed for all patients who underwent breast reconstruction with autologous tissue under one surgeon between 2002 and 2009 at the University Hospital, Ghent. Out of these 688 patients, 54 patients (7.8%) required tertiary surgery with autologous tissue after failure of implant breast reconstruction.
Results: The first reconstructive surgery involved 38 unilateral and 16 bilateral cases with a total of 70 operated breasts. A further 11 breasts were reconstructed following risk-reducing mastectomy or at the patient's request for aesthetic reasons. Out of 81 free-flap reconstructions, the deep inferior epigastric artery perforator (DIEAP) flap was the most harvested at 66 (81%). The mean ± SD operating time was 7.2 ± 1.8 h and the mean hospital stay was 7.2 ± 1.9 days. One total flap loss (1.2%) occurred. The mean follow-up was 31 months with a range between 3 months and 6 years. During follow-up, 30 patients (55.5%) needed secondary procedures to improve the aesthetic outcome. Donor-site corrections were performed in 18 patients (33%). Revisions of the breast flap were performed in 29 patients (53%).
Conclusions: Restoring the breast envelope and footprint, in addition to excision of scar tissue, is the key step in breast reconstruction. Further corrections are required depending on the amount of the initial damage to the breast or subsequent postoperative complications.

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Immediate breast reconstruction with tissue expanders and implants continues to be a commonly used reconstructive modality. The advantages include simplicity of placement, lack of donor-site morbidity and preservation of alternative breast reconstructive options, should the need arise. However, implant reconstructions are fraught with potential complications and lack longevity of results. The evolving role of radiotherapy in the treatment of breast cancer has resulted in increasing numbers of women receiving adjuvant chest-wall irradiation. There have been numerous studies addressing the potentially negative effects of radiation on implant reconstruction. These studies generally conclude that high complication rates and poor aesthetic outcomes make irradiation a contraindication for this form of reconstruction. Possible sequelae include exposure, infection and capsular contracture,[1] which often necessitate re-operation or even complete revision of the reconstruction. This is a very stressful and demanding situation for both the patient and the surgeon, where careful decisions must be undertaken to adjust the strategy and eliminate potential causes of failure.[2]

At our institution, a primary breast reconstruction is defined as an immediate reconstruction at the time of mastectomy. Secondary breast reconstructions are delayed reconstructions, which are performed some time after mastectomy, and revisions are planned as well as essential steps for achieving symmetry. By contrast, a tertiary breast reconstruction is a redo reconstruction in case of unsatisfactory results or failure of a primary or secondary breast reconstruction. Reconstruction following a total failure provides an opportunity to reconsider the problem, seek a better solution and pursue a superior result for the patient.[3] This article presents the indications, method of reconstruction and outcomes with tertiary surgery after implant-based breast reconstruction failure.

Methods

A retrospective case note review was performed for all patients who underwent breast reconstruction with autologous tissue between 2002 and 2009 at the Department of Plastic Surgery, Ghent University Hospital, Belgium. A total of 688 patients underwent autologous breast reconstruction by the senior author (MH) during the study period. Among this group, there were 54 patients (7.8%), who underwent tertiary surgery with autologous tissue after failure of implant breast reconstruction. The demographics, operative details, oncology and postoperative course were recorded. Patient characteristics included age, gender, smoking habit, body mass index (BMI), presence of co-morbidities and abdominal scars. Oncologic details included location, pathology, stage and adjuvant therapy. Operative notes and photographs were used to identify the specific resection performed, initial reconstruction, causes of failure, indications for tertiary reconstruction and outcomes.

Surgical technique

Our starting point in salvage implant breast reconstruction is to restore the breast anatomy or what remains of it. The different anatomical structures are repositioned or reconstructed before proceeding to the actual reconstruction itself. Previous mastectomy scars are opened to gain access to the breast. If previous nipple reconstruction was performed, it is important to judge the expected postoperative nipple position to decide where to open up the breast (Figure 1(a)). It is essential to undermine the upper breast skin to the upper border of the breast footprint (Figure 1(b)), thereby fully releasing the scar contracture and ensuring the reconstruction sits in the correct position. The prosthesis is removed together with the cranial part of the anterior capsule. All scar contractures are sequentially released. These are often most marked in the region of the anterior axillary fold. The pectoralis muscle, which is usually lifted during the primary procedure for retromuscular placement of the prosthesis, is repositioned in its original position where it can be fixed with a couple of permanent sutures (Figure 1(b)). The most caudal part of the anterior capsule is preserved and scored vertically for release, prior to securing it to the inferior breast skin. This solid capsular tissue has the benefit of increasing the amount of vascularised tissue under the thin skin flaps and can also be used for re-creating or adjusting the inframammary fold (IMF) (Figure 1(c)). The IMF must be recreated as a well-defined anatomical landmark at the inferior border of the breast footprint, as this is a key feature in determining the final breast shape. If a latissimus dorsi flap was used in the initial reconstruction, it can be either completely resected, depithelialised as additional autogenous bulk, or repositioned in its intended position. Only in this way, the actual footprint of the breast is reconstructed making it the ideal platform for further breast mound reconstruction.

Our first choice for the free-flap breast reconstruction is the deep inferior epigastric perforator artery (DIEAP) flap (Figures 1 and 2), followed by the superficial inferior epigastric artery (SIEA) flap (Figure 3).[4,5] More recently, the transverse musculocutaneous gracilis (TMG) flap became our second choice when the abdominal tissue was scarce or unavailable.[6] The superior glutaeal artery perforator (SGAP) flap has become our last choice of flap as a result of its limited pedicle length, number of position changes, troublesome inset and unsatisfactory appearance of the donor site. The overall look and feel of an SGAP reconstruction is considered to be inferior to a deep inferior epigastric artery perforator (DIEAP) flap.

Results

The mean patient age was 46.8 ± 8.2 years. In 15 cases (27%), a skin-sparing mastectomy had been performed. Thirty-seven patients (62.9%) had required adjuvant radiotherapy and three of the bilateral mastectomies received neo-adjuvant radiotherapy. Thirty-nine patients (72%) had a course of chemotherapy. The initial reconstructive surgery had been performed in 38 unilateral and 16 bilateral cases with a total of 70 operated breasts. At the time of presentation, primary or secondary reconstruction was already done as an initial reconstructive method in 41 and 29 cases, respectively. Among the patients who had primary reconstruction, 58.5% of them had radiotherapy, while 76.8% of the secondary reconstructions had radiotherapy before the initial reconstruction. The initial reconstructive procedures included an expander-implant