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Breast reconstruction after breast conservation therapy for breast cancer

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ABSTRACT

Conservative breast surgery followed by irradiation, often referred to as Breast conserving therapy (BCT), has replaced modified radical mastectomy for the treatment of early stage invasive breast cancer and ductal carcinoma in situ (DCIS). About 10% to 40% of the patients treated with BCT have poor cosmetic outcome results. Small tumours in large breasts can be successfully treated by lumpectomy and radiotherapy, with good cosmetic outcome. However when the tumour breast ratio is higher, the cosmetic outcome can be very disappointing. A surgical conflict arises between optimal oncologic resection and the desire to spare as much tissue as possible to minimize the risk of deformities. In case of a small defect lipofilling can be performed. This technique transplants fat grafts from a donor site to the defect in the breast. In case of larger defects there is the option of oncoplastic surgery. Oncoplastic techniques combine the optimal oncological resection with an adequate reconstruction for optimal cosmetic outcome. Oncoplastic techniques allow the breast surgeon to perform a tumour resection with adequate margins and the plastic surgeon will reconstruct the defect during the same procedure for optimal cosmetic outcome. The use of oncoplastic techniques to reconstruct defects of partial mastectomies (BCT) can be immediate, delayed or immediate delayed.

Current breast cancer treatment leads to long-term survival. It is therefore important not only to survive but also life. Therefore the quality of life and good cosmetic outcome is mandatory after breast cancer treatment.

Oncoplastic surgery is based on two techniques: volume displacement and volume replacement.

The volume displacement techniques use (dermo)glandular flaps of the breast to fill the resection defect. Volume displacement techniques ideally work when the tumour resection can be incorporated in a breast reduction pattern. A similar technique is used on the contralateral breast to match size and shape.

The volume replacement techniques use autologous non-breast tissues to compensate the volume loss after tumour resection. Volume replacement techniques are used when a large resection volume is needed in a small breast. Depending on the location and size of the defect many different flaps can be used for partial breast reconstruction.

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Abbreviations: BCT, breast conservative treatment.

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Introduction

The treatment of breast cancer is a continuous evolving field. Maximizing patients' survival and minimizing treatment's morbidity are the keystones in breast cancer treatment and breast cancer research [1]. Conservative surgery followed by breast irradiation, often referred to as Breast conserving therapy (BCT), has replaced modified radical mastectomy for the treatment of early stage invasive breast cancer [2–4]. Multiple trials proved equivalent disease-free and overall survival outcomes when

patients with early stages of breast cancer are treated with partial mastectomy (lumpectomy/quadrantectomy) and radiation therapy or modified radical mastectomy [2–4].

Oncologic and cosmetic outcome of Breast conservative treatment (BCT)

The primary goal in BCT is achieving tumour free margins, despite all the surgical efforts positive margins can be found in 20% to 40% of the tumour excisions, leading to additional radiotherapy or surgical re-interventions (reexcision or mastectomy) [5–8].

Local recurrences rate after BCT is 1,4% per year. The treatment of in breast tumour recurrence is in most patients mastectomy [9]. Larger tumour free margins can reduce local recurrence rates, however optimal margins remain controversial and it may lead to unacceptable cosmetic outcome.

Satisfactory cosmetic outcome after BCT is mandatory. Cosmetic results depend on the patient's age, race, the size and symmetry of the breast, location of the tumour, amount of tissue removed and the amount of radiation given. 10% to 40% of the patients treated with BCT

have poor cosmetic results [10]. Small tumours in large breasts can be successfully treated by standard lumpectomy and radiotherapy, with good cosmetic outcome. However when the tumour breast ratio is higher, the cosmetic outcome after standard lumpectomy can be very disappointing [11].

A surgical conflict arises between optimal oncologic resection and the desire to spare as much glandular tissue as possible to minimize the risk of unacceptable local deformity. This dilemma has led to the evolution of procedures that can both reconstruct the resection defect and prevent the need for mastectomy, the so called oncoplastic techniques. [12] These techniques combine oncological resections with plastic surgery techniques in one single procedure. They allow for local wider tumour excisions, with lower risk of margin involvement and oncologic benefits, while avoiding more extensive surgery (mastectomy) with higher complication and morbidity rates [11,13]. Introduction of more efficient protocols of neo-adjuvant chemotherapy for the treatment of more aggressive tumours may allow more conservative local treatment [14]. The value of oncoplastic surgery especially increases in those cases, allowing local excision of the tumour.

(a) preoperative views



(c) final results



(b) early postoperative views with irradiation dermatitis



Fig. 1. A 65-year-old patient with invasive ductal carcinoma in the inferolateral pole of the right breast. The tumour was widely excised. Tumour resection lines were included in reduction lines (a) preoperative views. (b) early postoperative views with irradiation dermatitis. (c) final results.

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