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Review

Oncoplastic breast conserving surgery and oncological outcome: Systematic review

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Abstract

Oncoplastic surgery consists a new approach for extending breast conserving surgery possibilities This manuscript aimed to systematically review data on the oncological outcome of oncoplastic breast surgery. Electronic databases were searched with the appropriate search term up to and included April 2013. Inclusion criteria: full publications including at least 10 patients and providing evidence on at least one of the following outcomes: margin involvement, local recurrence, metastatic disease, death number. Forty studies including 2830 patients, met inclusion criteria; twenty one studies investigated volume displacement techniques; fifteen studies investigated volume replacement techniques; four studies presented data on various oncoplastic techniques. Study quality was low. The majority of studies were observational studies. The length of follow up was relatively short, with only two studies reporting a median duration longer than 60 months. Only seven studies including more than 100 patients. There was great variation in the frequency of margin involvement ranging between 0% and 36% of patients. Local recurrence was observed in 0–10.8% of patients. Distant metastasis was observed in 0–18.9% of patients. In conclusion, long term oncological outcome of oncoplastic surgery for breast cancer is not adequately investigated. Further research efforts should focus on Level I evidence on oncological outcome of oncoplastic surgery.

Keywords: Oncoplastic; Breast conservation; Mastectomy; Mammaplasty; Oncological outcome

Introduction

Breast conserving surgery and radiotherapy has become the standard of care for the treatment of most women with early breast cancer because of its comparable survival with total mastectomy.[1] The goals of breast conserving surgery are the removal of breast cancer with an adequate surgical margin and maintenance of a breast that is cosmetically acceptable to the patient. Oncoplastic surgery that combines techniques of breast cancer surgery with techniques of plastic surgery allows for the removal of large tumours with wider margins and better cosmetic results. Thus, oncoplastic surgery allows the extension of indications of breast conserving surgery including retroareolar tumours and tumours greater than 3 cm.[2]

There are many different kinds of techniques that can be used to perform oncoplastic breast surgery. They can be represented as volume replacement and displacement techniques. Volume displacement techniques include adjacent tissue rearrangement, dermoglandular flap transfer and breast reducing techniques. Volume replacement techniques replace the volume of excised breast tissue using autologous tissues from an extra mammary site.[3,4] The subaxillary fat (rotation mammoplasty) is commonly used for upper pole tumours. Upper abdominal fat (thoraco-epigastric flap) is preferred for inferior pole tumours, which are

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mobilized and rotated to fill the defect. Latissimus dorsi mini flaps have also been used.[3,4]

Volume displacement techniques and especially adjacent tissue rearrangement techniques are the most commonly applied oncoplastic techniques. Adjacent tissue rearrangement techniques include accurate decision of skin incision, skin undermining i.e mobilizing the remaining breast tissue surrounding the wide excision defect from the skin and chest wall, NAC undermining, glandular re-approximation and de-epithelialization and NAC repositioning. Local dermoglandular flaps may be used to replace local tissue defects following wide excision of lesions. Central excisions including the nipple–areolar complex can also be replaced with a central flap of glandular tissue and overlying skin. Well established techniques, such as the "Grisotti" technique, the 'round block' and "batwing" approach, enable resection of tumours in particular clinical situations. Therapeutic mammaplasty involves resection of the tumour and remodelling the breast using a breast reduction technique. This technique is appropriate for patients with larger breasts requiring excision of significant volumes of tissue in the medial or inferior pole. Contralateral symmetrization is often needed and can be performed concurrently. Volume displacement techniques are appropriate if the excised volume does not exceed 10% of the breast volume for medial tumours, or 20% of the breast volume for tumours situated laterally.[3,4]

Despite the favourable cosmetic outcome, the oncological outcome of oncoplastic surgery remains still under investigation. This systematic review aimed to investigate the oncological outcome of oncoplastic breast conserving surgery.

Methods

Pubmed, Scopus, Google Scholar, Science Citation Index were searched with the search terms "oncoplastic surgery", "breast cancer", "breast conserving surgery", "mastopexy", "volume displacement techniques", "parallelogram mastopexy lumpectomy", "round block technique", "reduction mammoplasty", "batwing mastopexy", "tennis racket method", "rotation flap", "rotation mammoplasty", "volume replacement techniques", "adipofascial flap", "lateral thoracodorsal flap", "thoraco-epigastric flap", "latissimus dorsi flap", "Grisotti flap", "perforator flap", "intercostal artery perforator flap", "thoracodorsal artery perforator flap". The search covered the period from 1966 up to including April 2013. Outcomes investigated included margin involvement, local recurrence, distant metastasis, number of deaths. Clinical trials randomized or not, cohort studies with or without a comparator group, case series, providing evidence for at least one of the above listed outcomes met inclusion criteria.

Exclusion criteria: (i) trials that involved both breast conserving oncoplastic surgery and mastectomy with reconstruction without presenting results separately for each group for at least one of the investigated outcomes; (ii) studies including less than 10 patients (iii) studies investigating oncoplastic breast conserving surgery for benign breast tumours i.e fibroadenoma (iv) studies describing techniques of oncoplastic breast conserving surgery without providing evidence on oncological outcome (iv) case reports.

Only full publications were considered. There was no language restriction. The reference list of all identified trials was checked for more relevant articles. Double publications were identified. The English publication was included for articles published in non European languages while the most complete report was included for articles published in European languages. Consecutive publications of case series with gradually increasing number of patients published by the same group of authors and the same institutions were identified and the most recent update was included.

Study quality was evaluated based on the following criteria: study design, number of included patients, adequate description of selection criteria of participants, outcome definition, duration of follow up, withdrawal and description of reasons for withdrawal. Low quality was not an exclusion criterion, as low quality was expected for the majority of the studies and the authors did not want to introduce systematic bias by setting too strict selection criteria.

Extracted data included author name, year of publication, number of patients, oncoplastic technique, margin involvement, follow up time, number of patients presenting with local recurrence, number of patients presenting with distant metastasis, number of deaths. Margin involvement included both positive and close margins. Local recurrence was expressed as the proportion of patients presenting with local recurrence. Distant metastasis was expresses as the proportion of patients presenting with distant metastasis.

Results

Initially two hundred sixty seven possibly relevant trials were identified and after reviewing the title and abstract, possibly eligible studies were obtained in full text. Finally forty studies including 2830 patients, met inclusion criteria.[5–45] Twenty one studies including 1171 patients investigated volume displacement techniques (Table 1).[5–25] Fifteen studies including 707 patients investigated volume replacement techniques (Table 2).[26–40] Four studies including 952 patients presented data on various oncoplastic techniques (Table 3).[41–45]

Study quality was low. The majority of studies were observational studies. The length of follow up was relatively short, with only two studies reporting a median duration longer than 60 months.[17,41] Most of the studies included fewer than 100 patients with only seven studies including more than 100 patients.

There was heterogeneity in study population, duration and reporting of follow up, as well as in outcome definition. Follow up was reported either as mean follow up or as median follow up in different studies. Providing both mean and median follow up would be more appropriate.