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Skin reducing mastectomy and immediate reconstruction: The effect of radiotherapy on complications and patient reported outcomes

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Abstract

Aim: Skin reducing mastectomy, dermal sling and immediate implant reconstruction (SRMIR) is an emerging technique where, de-epithelialised inferior skin flap sutured to pectoralis major provides vascularised, dermal sling for the implant. We aimed to assess patient satisfaction following SRMIR and determine if radiotherapy affected patient reported outcomes.
Method: A prospective database of women undergoing SRMIR was analysed. SRMIR was performed in 92 women (116 breasts). Radiotherapy was received by 45 women and it was not required in 47 women. Forty eight women had contralateral surgery: 21 breast reduction/mastopexy, 1 augmentation, 26 mastectomy/reconstruction. A validated breast evaluation questionnaire provided patient reported outcomes.
Results: Median follow up was 20 months. Early complications were similar in both groups, but those in the radiotherapy group had a higher incidence of implant loss (6/45 = 13% vs 1/47 = 2%; $p = 0.06$) and grade III/IV capsular contracture (11/45 = 24% vs 6/47 = 13%; $p = 0.20$).

The outcome questionnaire was sent to 83 women who were disease free and had retained their implants. Sixty three women responded (76%). Patient reported satisfaction was high, with or without radiotherapy. Women receiving radiotherapy gave lower scores, but it was statistically significant only for general appearance and symmetry.
Conclusions: Although complications after radiotherapy are higher in patients who had SRMIR, the majority of women who retained their implant are highly satisfied with their reconstruction. Majority of these patients were happy to recommend SRMIR procedure to their friend.

Keywords: Skin reducing mastectomy; Breast cancer; Breast reconstruction; Breast implant; Radiotherapy; Dermal sling; Single stage breast reconstruction

Introduction

Skin reducing mastectomy, dermal sling and immediate subpectoral implant breast reconstruction is a relatively new technique in breast surgery, which makes use of the inferior breast skin as a sling to provide the lower part of the implant a completely vascularised internal pocket. If adequate ptosis exists or contralateral symmetrising surgery is chosen, the reconstruction can be completed in a single stage. Alternatively, expander prosthesis can be used to achieve symmetry. Patient reported satisfaction with SRMIR has been published in few studies with small number of patients and short follow up, but comparison of outcomes with and without radiotherapy has been lacking in the literature.

Radiotherapy is offered to women following mastectomy for node positive or higher risk breast cancer to decrease their risk of local recurrence.[1,2] Radiotherapy adversely affects the outcomes from breast reconstruction (particularly with implants) by increasing the risks of infection, capsular contracture and a poor cosmetic result.[3,4] Delayed reconstruction or autologous immediate reconstruction can be offered if radiotherapy is highly likely. Although the results of autologous breast reconstruction are better, many women are unsuitable or unwilling to have these surgeries and prefer an immediate, single stage procedure. Moreover, delayed implant reconstruction is

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even more difficult after radiotherapy such that many women, who are unsuitable for autologous reconstruction, may be refused any sort of reconstruction.

Immediate implant based reconstruction allows preservation of the skin envelope and does not preclude later autologous reconstruction. In some cases patients have chosen an immediate/delayed approach: an implant is placed at the time of skin reducing mastectomy to preserve the skin envelope and subsequent definitive, autologous reconstruction can be achieved after completion of adjuvant treatment.

Aim

The primary aim of this study was to investigate whether women were satisfied following skin reducing mastectomy and immediate subpectoral implant/expander based reconstruction.

Secondary aims were to study whether outcomes were affected by radiotherapy: early and medium term complications, in particular implant loss and capsular contracture and the patients' satisfaction with cosmetic and functional outcome. Knowledge of these outcomes will allow clinicians to provide women who are not candidates for autologous options to be informed of the risks and benefits of SRMIR.

Method

This study was carried out at a single breast surgery unit at Newcross Hospital in West Midlands, UK.

The unit receives tertiary referrals from neighbouring units, which do not have facilities for reconstruction.

The senior author prospectively collected information for a database of women undergoing surgery for breast cancer. This database was used to identify those women who chose skin reducing mastectomy and immediate breast reconstruction with the dermal sling technique. Every consecutive patient was included between 2006 and 2011. Their hospital records were searched for demographic data, details of breast cancer size and nodal involvement.

We recorded date and type of surgery, contralateral surgery, early and late complications, details of radiotherapy or chemotherapy and length of follow up (Table 1). Surgical procedures for symmetry and additional procedures, such as lipomodelling or revision surgery were documented. No patients were excluded from this data collection, which was undertaken retrospectively. All procedures were carried out by a single surgeon.

Table 1
Patient demographics and procedures.

	Radiotherapy (RT)	No radiotherapy (NRT)
Total women	45	47
Mean age (years)	49.5	52.1
Mean BMI	27.3	27.2
Smokers	7	6
Previous contralateral surgery	1 (LD)	1 (LD)
Mean tumour size [in mm]	48	28
Total SRM [Breasts]	57	59
Contralateral mastopexy/reduction/ augmentation	11	11
Immediate/delayed approach	7	4
Follow up [median] months	23	18
Total questionnaires sent[a]	37	46
Total questionnaire completed	26 (70%)	37 (80%)

BMI- Body Mass Index, LD- Latissimus Dorsi flap, SRM- Skin Reducing Mastectomy.

[a] Exclusions for questionnaire included implant loss and metastatic disease.

Surgical technique

Preoperative markings were made with the patient in sitting position. A standard 'wise' pattern was used, with a triangular excision of the nipple and medial and lateral extensions. The mastectomy was performed through these incisions. The inferior skin, adjacent to the inframammary fold (IMF) was not discarded. Instead, it was left attached along the whole length of the IMF and de-epithelialised. The superior medial and lateral skin flaps, which would be redraped to make the medial and lateral skin of the breast, were incised along their lower edge so that three flaps were created in total: medial skin flap, lateral skin flap and inferior de-epithelialised flap.[6] The pectoralis muscle was raised in the usual way and the implant or expander was placed beneath the muscle.

The de-epithelialised skin was sutured to the lower border of the pectoralis major and in this way provided a completely vascularised pocket for the implant/expander (IE). The medial and lateral skin was then re-draped over the new breast mound and skin closed as an inverted T, as usual for a wise pattern breast reduction. If the breast was ptotic, the redundant skin was sufficient to accommodate an implant of similar volume to the remaining breast, and volume symmetry was satisfactory after a single operation. Shape symmetry was improved in women with larger breasts, if the woman requested a simultaneous contralateral Mastopexy (Fig. 1). Nipple reconstruction and tattooing was performed as second stage procedure under local anaesthetic.

A total of 92 women choosing skin reducing mastectomy and immediate implant based reconstruction were identified. If a woman had sufficient ptosis, the breast skin could be redistributed to create a large enough pocket for a fixed volume implant at the primary operation. If the breast was small, or contralateral surgery was not chosen, an implant/IE (McGhan style 150, Inamed Aesthetics, Ireland) was inserted to allow expansion after completion of radiotherapy and adjustment of size at a later date as required. The patient was fully consented for the procedure and the possibility of poor outcome requiring revision of surgery was fully discussed.

An immediate/delayed approach was chosen by 11 women, who requested a DIEP flap (Deep Inferior Epigastric Perforator) at the outset, but preferred to delay the