A single institution experience with skin sparing mastectomy and immediate breast reconstruction

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ABSTRACT

INTRODUCTION Skin sparing mastectomies (SSMs) represent a surgical approach that preserves the natural skin envelope of the breast and, when combined with immediate reconstruction, offers a good cosmetic outcome. The aim of this retrospective study was to compare the risk of local recurrence (LR) in this series with the known rate of recurrence following a conventional mastectomy.

METHODS A total of 108 patients with breast cancer who underwent an SSM and immediate breast reconstruction over a 6-year period were reviewed.

RESULTS A follow-up of more than eight years showed that three patients (2.78%) had developed LR.

CONCLUSIONS The rate of LR is low with SSMs and is comparable to that seen with conventional mastectomies.

KEYWORDS

Breast – Reconstruction – Mastectomy

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According to the NHS Information Centre's Hospital Episode Statistics, 131,566 women in England were diagnosed with breast cancer in 2004–2005. Of these, 16,838 underwent a mastectomy, of which only 1,623 (9.6%) benefited from a skin sparing approach. It is expected that almost all women who have been recommended a mastectomy will be offered reconstruction in the immediate setting or as a delayed procedure. Skin sparing mastectomies (SSMs) and immediate breast reconstruction (IBR) preserves the natural contours by sparing the native skin, preserves sensation, minimises scars, gives cosmetic results (thereby increasing self esteem) and lowers psychological morbidity.¹ Oncological safety in terms of local and systemic recurrence is a serious concern.

Methods

A retrospective study was carried out on all patients with breast cancer treated with an SSM and IBR over a six-year period from 1999 to 2005. A single consultant breast surgeon carried out all SSMs and IBRs in a single institution. All patients were discussed in our local multidisciplinary meeting before and after surgery.

Results

A total of 108 patients, with a mean age of 49 years (range: 28–70 years), underwent an SSM and IBR, of which 78 pa-

tients (72.22%) had invasive cancer and 30 (27.78%) had a ductal carcinoma *in situ* (DCIS) only. Of the invasive cancers, 63 were ductal, 9 were lobular and 6 had other histological types. The mean tumour size of the invasive cancers on final histology was 29.9mm and ranged from 2mm to 100mm. Tumour grade (modified Scarff–Bloom–Richardson grading system),^{2,3} lymph node involvement, lymphovascular invasion and receptor status are given in Table 1, Nottingham prognostic index in Table 2 and TNM (tumour, nodes, metastasis) staging⁴ in Table 3.

In our series of 108 patients, 67 patients had a primary mastectomy, 27 had a completion mastectomy and 8 patients underwent an SSM for recurrence after breast conserving surgery. Four patients had a bilateral SSM for bilateral disease. Three patients opted for a contralateral prophylactic mastectomy.

Seventy-five patients (69.44%) had a latissimus dorsi flap with or without an implant and five patients (4.62%) underwent reconstruction utilising a pedicled transverse rectus abdominis myocutaneous flap. The other 28 patients (25.93%) had implant-based reconstruction only.

Of the 25 patients who had post-reconstruction radiotherapy, 9 developed a capsular contracture and 8 of these required an exchange of implant. Thirty-three patients (30.56%) had chemotherapy, of whom 20 required adjuvant radiotherapy as well. Two patients in our series had neo-adjuvant chemotherapy prior to their SSM and IBR. In two patients there was a delay of two months in commencement

Table 1 Clinicopathologic features of tumours

Grade	n
1	14
2	43
3	21
Total	78
Lymph nodes positive	n
≤3	20
4–9	5
≥10	4
Total	29
Receptors and lymphovascular invasion	n
ER/PR positive	91
Lymphovascular invasion	18

of the adjuvant therapy (chemotherapy for one and radiotherapy for the other) due to wound infection.

The mean follow-up of the patients in our series was 58 months (range: 21–99 months). One patient moved out of the area and was lost to follow-up. Three patients had local recurrence (LR). None of the 30 patients who underwent surgery for DCIS only had any recurrence. All patients with LR were detected clinically in the spared native skin envelope. The mean time to LR was 25 months. One patient with LR was oestrogen receptor (ER)/progesterone receptor (PR) negative and Human Epidermal growth factor Receptor 2 (HER2) positive; she was treated with trastuzumab. Of the four patients who were HER2 positive one had LR, one had nodal recurrence and one had systemic recurrence. The mean time to systemic recurrence was 17 months. Two of the five patients with systemic recurrence were negative for ER/PR.

Among the patients with LR (Table 4), one patient had undergone a primary SSM and IBR, one a completion SSM and IBR, and one patient had undergone an SSM and IBR for recurrence after initial breast conserving surgery. Recurrences after an SSM and IBR were widely excised and

Table 3 TNM staging

Stage	n
0	29 (26.6%)
1	34 (31.4%)
2A	32 (29.6%)
2B	5 (4.6%)
3A	5 (4.6%)
3B	3 (2.7%)

confirmed as complete histologically. Two of these patients were given radiotherapy subsequently. The patient with nodal recurrence was given trastuzumab. She later had systemic disease and required palliative radiotherapy for bony metastasis. The mean follow-up for the patients treated after LR was 37 months, with none of them developing systemic recurrence. There was no procedure-related mortality in our series.

A total of 25 patients (23.15%) underwent radiotherapy and 33 patients (30.56%) had chemotherapy. Complications and their rates are given in Table 5.

Discussion

The rate of local (2.78%) and systemic recurrence (4.63%) in our study is comparable with most published rates for SSMs.^{5–7} In the majority of instances (70–75%), LR occurs within three years of an SSM.⁹ The rate of LR in our series was no greater than that expected after a conventional mastectomy.^{9,10}

The best evidence on this subject is the meta-analysis of observational studies by Lanitis *et al* that concluded there was no difference in the rates of LR between skin sparing and non-skin sparing mastectomies. However, the authors went on to add that one should be guarded in drawing this conclusion as there is no randomised controlled trial on this subject.¹¹

Sheik *et al* found in a study with a follow-up of 28 months that SSMs were a risk factor for inadequate margins, especially with multiple ipsilateral tumours, and/or upper medial quadrant disease.¹²

In their study of 1,810 patients, Yi *et al* found that those

Table 2 Nottingham prognostic index; only 78 patients had invasive cancer

Nottingham prognostic index	Number of patients	
≤2.4	Very good prognosis	6 (7.7%)
2.41–3.4	Good prognosis	26 (33.3%)
3.41–4.4	Moderate prognosis 1	29 (37.2%)
4.41–5.4	Moderate prognosis 2	11 (14.1%)
5.41–6.4	Poor prognosis	6 (7.7%)
≥6.41	Very poor prognosis	0 (0%)

Table 4 Characteristics of patients with local recurrence

Age (years)	Size (mm)	Lymph node	Receptor status	Grade	LVI	NPI	Stage	Adjuvant therapy
77	20	Negative	Negative	3	Positive	4.4	1	C/R
35	12	Positive	Positive	1	Negative	2.24	2A	C/R
33	12	Positive	Positive	3	Negative	5.24	2A	C/R

LVI = lymphovascular invasion; NPI = Nottingham prognostic index; C = chemotherapy; R = radiotherapy

undergoing conventional mastectomies were older and more likely to have stage IIB or III disease compared to SSMs.¹⁵

A single institution observational study such as ours has limitations in the assessment of oncological safety of SSMs. Morrow has emphasised that surgical procedures aimed at improving cosmetic outcomes need to be tested rigorously before making definitive conclusions on oncological safety.¹⁴

LR is influenced by tumour factors such as size, grade, nodal involvement, lymphovascular invasion and receptor expression, and cannot be ascribed to inadequate surgical excision alone.⁸ Most recurrences occur in the skin or scar site of the mastectomy and are readily detectable by physical examination.¹⁵

Post-mastectomy radiotherapy (PMRT) is known to reduce locoregional recurrence and improve survival, and is indicated in patients with more than four positive lymph nodes or large tumours.¹⁰ The most common complications after PMRT are fat necrosis, radiation fibrosis and capsular contracture in patients with implants. Capsule contracture can be treated with a capsulotomy or capsulectomy.¹⁶ Where PMRT is likely, using a tissue expander or prosthesis followed by replacement after radiotherapy with a definitive implant or autologous flap reconstruction (ie a two-stage technique) is a useful alternative.¹⁶ Since radiotherapy is usually not required after a mastectomy for DCIS, SSMs and IBR seem to be an excellent treatment choice.¹⁷ Although rates of wound infection are increased after SSMs and IBR, wound infection did not delay the initiation of adjuvant therapy.¹⁸

Conclusions

In our study SSMs and IBR were found to be oncologically safe. This technique is not a contraindication for radiotherapy, offers superior cosmetic outcomes and does not delay adjuvant therapies.

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