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# Immediate breast reconstruction with a myocutaneous latissimus dorsi flap and implant following skin-sparing salvage mastectomy after irradiation as part of breast-conserving therapy

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**KEYWORDS**
Skin-sparing mastectomy;
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Breast-conserving therapy;
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**Summary** *Background:* Local relapse after breast-conserving therapy including whole breast irradiation is typically treated by salvage mastectomy. Immediate reconstruction by pedicled transfer of a latissimus dorsi flap in combination with implantation of a definitive prosthesis or temporary tissue expander following skin sparing salvage mastectomy has been shown to be feasible. However, it has never been shown to be justifiable.
*Aim:* The aim of the study was to compare the outcome of this procedure to the widely accepted secondary breast reconstruction by combined latissimus dorsi flap and implant after mastectomy and adjuvant radiotherapy.
*Methodology:* The surgical outcome of 93 immediate latissimus dorsi and implant reconstructions after skin-sparing salvage mastectomy performed from 2007 to 2011 after radiotherapy was compared to that of 83 secondary reconstructions with the latissimus dorsi and an implant. The follow-up duration was 3.5 years in both groups. Complications were categorized as minor (conservative treatment sufficed) or major (flap loss, mammary skin loss, implant loss, seroma or haematoma indicating repeat surgery).
*Results:* The salvage group scored significantly less on half of the patient-related and procedure-related risk factors. Nevertheless, we observed 27% of short-term major surgical complications and an ultimate success rate of 94% in the salvage group compared to those

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observed in our series of secondary reconstruction in post-radiation women (27% and 93%, respectively).
*Conclusion:* Skin-sparing salvage mastectomy combined with immediate reconstruction by transfer of a latissimus dorsi flap with an implant is a justifiable reconstructive option for women with a recurrence after irradiation as part of breast-conserving therapy.


## Introduction

The objective of breast-conserving surgery and radiotherapy for breast cancer is to achieve a maximum aesthetic outcome and minimal psychological morbidity without compromising local control and overall survival. Such breast-conserving treatments have overall survival and distant disease-free survival rates comparable to those of mastectomy.[1–3] Nevertheless, locoregional recurrence or second primary carcinoma occurs in 8.8–12% of patients in the first 20 years after breast-conserving treatment.[2,4] The standard treatment for such local relapse is salvage mastectomy.[5]

As proven in women treated for primary breast cancer, immediate breast reconstruction after salvage mastectomy may help women recover optimally.[6] Spear et al.[7] and Disa et al.[8] showed the feasibility of reconstruction by pedicled transfer of a latissimus dorsi flap in combination with implantation of a definitive prosthesis or temporary tissue expander in cases where immediate breast reconstruction by sole autologous tissue transfer is not indicated. Immediate reconstruction is associated with surgical complications such as seroma or haematoma (9–11%),[7,8] (partial) loss of mammary skin (9–14%),[7,8] (partial) flap loss (2%)[8] and loss of implant because of infection (4%).[8] To date, this seemingly high prevalence of surgical complications has not been justified. For this purpose, we compared the surgical and oncological outcomes of this procedure to those of the widely accepted technique of secondary breast reconstruction by combined latissimus dorsi flap and implant after previous mastectomy and adjuvant radiotherapy. The research protocol was approved by the local ethical committee.

## Material and methods

### Patients

#### Salvage mastectomy and immediate breast reconstruction

From January 2007 to December 2011, we performed 93 salvage mastectomies with immediate reconstruction by combined latissimus dorsi transfer and an implant in 89 women ('salvage group') after previous breast-conserving therapy (Table 1). Four of these women underwent immediate reconstruction bilaterally. The indications for salvage mastectomy were locally recurring breast cancer ($n = 65$) or radiation-induced sarcoma of the breast ($n = 1$), prophylactic complementary ablation because of BRCA 1 or 2 germ-line mutation discovered after breast-conserving treatment ($n = 21$) or severe fibrosis of the irradiated breast ($n = 6$). Salvage mastectomy was performed, on average, 109 months (range, 5–348 months) after breast-conserving treatment, which included adjuvant whole-breast radiotherapy in all women. All breasts had been irradiated previously. Further, radiation data were available for 73 of the 93 breasts, with a mean radiation dose of 5080 cGy (range, 4250–7000 cGy).

#### Secondary breast reconstruction

During the same period, we performed 83 secondary breast reconstructions in 82 women ('secondary group') by combined latissimus dorsi transfer and an implant (Table 1). One woman underwent surgery bilaterally. These reconstructions were performed 32.5 months (range, 7–211) after primary mastectomy for proven breast cancer. All women completed adjuvant radiotherapy before secondary

**Table 1** Patient-related characteristics of women undergoing immediate breast reconstruction after skin-sparing salvage mastectomy compared to those of women undergoing secondary surgery.

| Mean of patient-related factors (range) | Salvage group ($n = 93$) | Secondary group ($n = 83$) | $p$-value of difference |
|---|---|---|---|
| Age (years) | 52.5 (24–78) | 46.3 (28–76) | <0.002 |
| BMI (kg/m$^2$) | 24.5 (17.1–35.5) | 24.6 (17.8–33.7) | 0.34 |
| Previous radiation dose (cGray)[a] | 5080 (4250–7000) | 4942 (4000–5000) | 0.006 |
| Time elapsed since radiotherapy (months) | 109 (5–348) | 32.5 (7–211) | <0.002 |
| Tobacco abuse | 12 | 19 | 0.08 |
| Diabetes mellitus | 0 | 0 | – |
| Cardiovascular or pulmonary co-Morbidity | 12 | 12 | 0.76 |
| Other co-morbidity | 9 | 16 | 0.07 |

[a] Data on radiation dose available for 70 of 93 and 69 of 83 breasts, respectively.