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Autologous breast reconstruction using the immediately lipofilled extended latissimus dorsi flap

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Summary *Background:* The latissimus dorsi flap is a popular choice for autologous breast reconstruction. To dramatically improve volume, we report our experience of using the immediately lipofilled extended latissimus dorsi (ELD) flap and show it as a valid option for autologous breast reconstruction.
Methods: Patients undergoing the procedure between December 2013 and June 2016 were included. Demographic, clinical and operative factors were analysed, together with in-hospital morbidity and duration of postoperative hospital stay.
Results: A total of 71 ELD flaps with immediate lipofilling were performed. Forty-five reconstructions were immediate and the remaining 26 delayed. Median (range) volume of autologous fat injected immediately was 171 ml (40–630 ml). Contralateral reductions were performed in 25 patients with the median reduction volume 185 g (89–683 g). Median duration of admission was 6.5 (3–18) days and patients were followed up for 12 months (1–37). Three total flap failures occurred and had to be excised (4%). One haematoma occurred requiring drainage (1%). Signs of infection requiring intravenous antibiotics occurred in five patients (7%). In 5 patients wound dehiscence occurred, and only two of these required resuturing (3%). In total, 7 patients developed a seroma requiring repeated drainage (10%). Three reconstructions experienced mild mastectomy flap necrosis with no needing reoperation (4%).
Conclusions: Our experience represents the largest series to date and shows that in carefully selected patients the technique is safe, can avoid the requirement for implants, and has the potential to streamline the reconstructive journey.

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Introduction

Originally described by Tansini in 1906 and contemporized by Bostwick in 1978,[1,2] the latissimus dorsi (LD) flap is a popular choice for autologous breast reconstruction. Due to the limited flap volume that could be obtained from the back, the use of abdominal tissue for purely autologous breast reconstruction was preferred. In the 1980s, LD flap volume was increased by including the lumbar fascia and by including large oblique skin island scars.[3] Other larger skin paddle designs such as the fleur-de-lys were also reported, but these techniques quickly fell out of favour because of large scars that were prone to stretching.[4] The concept of the extended latissimus dorsi (ELD) flap became popular during the 1990s and referred to the inclusion of larger de-epithelialized skin paddles and additional subcutaneous fat from adjacent locations such as scapular, parascapular, trapezius and iliac crest.[5–11] Because of these technical developments, the ELD has become the preferred option for many surgeons based on its favourable donor site, the ease of harvest, shorter recovery time and the avoidance of microvascular complications inherent to any free tissue transfer.[12]

In some women, even ELD flaps cannot provide sufficient volume to match the contralateral breast. In these situations, additional volume has been traditionally provided with implants with further symmetrisation by contralateral breast reduction. Although implant use with LD reconstructions has historically been commonplace, cosmetic outcomes are often inferior and less durable over time in comparison to fully autologous solutions, particularly when dealing with unilateral breast reconstructions. The use of implants can also be problematic when patients have received, or are due to receive, radiotherapy. In addition, patients are often keen to avoid further corrective procedures that are often required with breast implants. Lipofilling has quickly established itself as an invaluable tool for the reconstructive breast surgeon and offers a fully autologous alternative for volume enhancement. Meeting reconstructive goals expeditiously is important in patients with breast cancer. Patients experience psychological stress following their diagnosis and can endure substantial morbidity associated with mastectomy, chemoradiotherapy and axillary surgery. The prospect of undergoing primary breast reconstruction followed by multiple ancillary procedures for symmetrisation, nipple reconstruction and areolar tattooing is often daunting. As a result, opportunities to streamline this process are being developed. The financial benefits to the healthcare provider of shortening the reconstructive journey cannot be overstated.

In an attempt to address these issues, fully autologous breast reconstructions using immediately lipofilled ELD flaps have been developed.[13–15] This novel approach aims to enhance the volume achieved with the standard ELD, thereby potentially reducing the requirement for secondary procedures. This paper reports the largest series to date and aims to show that during the evolution and adoption of the technique, in carefully selected patients, it is safe, does not compromise flap survival, avoids the requirement for implants, can streamline the reconstructive journey and provides the patient with a high level of satisfaction.

Methods

Patient selection and data collection

All patients undertaking a reconstructive procedure are fully informed of all the free and pedicle flap reconstructive options available. The various risks and benefits associated with all the techniques are discussed, and multiple factors including patient body habitus, fitness for surgery and suitability of each flap are discussed. The group of patients in whom we have come to a joint decision to have an LD flap and immediate lipofilling performed are the ones included in this study. All patients undergoing immediate lipofilling of immediate or delayed LD breast reconstruction in the Edinburgh Breast Unit, Western General Hospital, Edinburgh and the Department of Plastic and Reconstructive Surgery, St Johns' Hospital, Livingston between 2013 and 2016 were included in the study. All oncological resections and axillary procedures were performed by a consultant oncoplastic breast surgeon with the latissimus flap being raised by a consultant plastic surgeon. Either surgeon then performed the breast reconstruction and immediate lipofilling. Data were collected retrospectively and were obtained from paper and electronic records. These data were entered into an encrypted excel spreadsheet. Institutional approval was obtained prior to the onset of this study and consent was obtained from all patients prior to the use of medical photographs. Ethical approval was considered not to be required for patients to have this procedure as it formed part of their treatment, collecting the data was deemed audit, and therefore did not require ethical approval. The protocol was scrutinized by the Breast Unit Management team. This study was conducted and set out in accordance to the World Medical Association Declaration of Helsinki (June 1964).

Operative technique

All patients were placed under general anaesthetic in the lateral decubitus position. The patient's free arm was secured in an overhead frame. Prepping and draping were performed as standard. LD skin paddles were orientated transversely within the bra line, with maximum paddle widths that permitted tension-free closure. For immediate reconstructions, mastectomy and the raising of the LD flap took place simultaneously using a two-team approach. For a delayed reconstruction the skin overlying pectoralis major was raised and, where appropriate, a new inframammary fold created and the raising of the LD flap occurred simultaneously using a two-team approach (Figure 1). A local anaesthetic and adrenaline mix was made up of 500 ml of 0.9% saline containing 200 mg of levobupivcaine and 1 mg of adrenaline. The mastectomy plane was infiltrated with this mix. Mastectomy was performed via a circumareolar incision and the plane was continued in a skin-sparing fashion with a mixture of blunt and diathermy dissection. ELD flaps were raised in a sub-scarpal plane ensuring capture of all additional adipofascial compartments as previously described. Once elevated, the thoracodorsal pedicle was dissected (not routinely imaged preoperatively) and the thoracodorsal nerve was transected. The insertion of the LD into the inter-tubercular groove was