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The drain game: Back drains for latissimus dorsi breast reconstruction

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KEYWORDS
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Summary *Introduction:* The pedicled latissimus dorsi myocutaneous (LD) flap is a popular breast reconstruction choice, representing approximately 50% of procedures undertaken in the UK. Donor site drain use may reduce complication rates, however no evidence exists regarding the duration of back drain use for LD flap breast reconstruction and calls have been made in the literature to investigate this further.
Aim: To compare inpatient hospital stay, drainage parameters and donor-site complications associated with closed suction back drain removal by post-operative day (POD) 3 regardless of output (early group), with removal after POD 3 where instructions were documented by drainage volume/24 h ± output consistency (late group), in post-mastectomy LD reconstruction donor sites.
Method: A retrospective review of LD breast reconstruction procedures, performed between January 2010 and July 2011, was undertaken to ensure 1 year minimum follow-up per patient.
Results: There were 81 patients who underwent unilateral LD breast reconstructions; 78 hospital records contained complete documentation. There were 48 patients in the late removal group and 30 patients in the early removal group. The mean drain removal day (5.42 ± 0.17 days vs. 2.87 ± 0.06 days, $p < 0.001$), total drainage (907.71 ± 76.07 ml vs. 492.67 ± 35.15 ml, $p < 0.0001$) and hospital inpatient stay (4.60 ± 0.19 days vs. 3.63 ± 0.17 days, $p < 0.001$) were greater for patients in the late group, versus the early group. There were no differences in total complications (16.67%(8/48) vs. 10%(3/30), $p = 0.41$), seroma (6.25%(3/48) vs. 6.67%(2/30), $p = 0.94$), dehiscence (4.17%(2/48) vs. 3.33%(1/30), $p = 0.85$) or haematoma rates (10.42%(5/48) vs. 0%(0/30), $p = 0.07$) between patients in the late and early groups; seroma sub-analysis also indicated no differences in number of seroma aspirations, duration of drainage (months) and mean total drainage (ml) prior to resolution.

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Discussion: These data suggest significant advantages for patients who have back drains removed by POD 3, without increased post-operative complications including seroma rates, and we recommend drain removal and patient discharge by POD 3.

Introduction

In 2010 93,083 women underwent breast reconstruction in the USA, with tissue expander-based reconstructions performed for 65,391 and autologous flap reconstruction procedures performed for over 18,500 patients.[1] In the UK 2010 national mastectomy and breast reconstruction audit of 18,216 patients, 3389 opted for immediate reconstruction, while 1731 opted for delayed reconstruction.[2] Of those who underwent immediate reconstruction, 21.7% (735/3389) had pedicled flap + implant/expander and 27.5% (932/3389) had pedicled flap reconstructions. Of those who underwent delayed reconstruction, 25.3% (438/1731) had pedicled flap + implant/expander and 25.8% (446/1731) had pedicled flap reconstructions. The pedicled latissimus dorsi myocutaneous (LD) flap is a popular choice for breast reconstruction, representing approximately 50% of procedures undertaken in the UK.[3] Tansini first reported using the LD, type V musculocutaneous flap for post-mastectomy reconstruction.[4,5]

The most frequently reported LD donor-site complication is seroma, with a reported incidence of up to 72%, depending on flap size and type.[6–9] Management is labour-intensive, often involving multiple visits for repeat drainage, often in the outpatient setting ± compressive dressings to prevent re-accumulation.[2,9–11] As such, numerous surgical techniques, to reduce seroma rates at the donor site, are described in the literature e.g. drain insertion, quilting sutures and fibrin glue.[12–14] It is generally recognised that seromas still occur post drain removal in most cases.[15] Opinions however vary considerably, with no clear evidence-based practice on the timing of post-operative LD donor site drain removal and seroma development, such that further investigation is required.[10,16]

Aim

The primary aim was to compare the donor-site complications associated with closed suction back drain removal by post-operative day (POD) 3 regardless of output (early group), with removal after POD 3 (late group), in post-mastectomy LD reconstruction donor sites. This cut-off was chosen due to the practice amongst several departmental Consultants of early drain removal. Secondary aims included analysis of drain output and inpatient hospital stay. The null hypothesis was that no differences would be found between these 2 groups (early vs. late).

Methods

After clinical governance registration, hospital database information was accessed using the clinical operative code 'LD' to generate a spreadsheet of procedures performed between January 2010 and July 2011. These dates were chosen to ensure adequate volume of performed procedures and a minimum 1 year follow-up for all patients included in the study. The inclusion criteria were all LD breast reconstructions, with donor site drains *in situ*, performed between the previously mentioned dates and the exclusion criteria were non-breast reconstructions or those procedures where full data were unavailable.

Hospital records and plastic surgery dressing clinic notes were retrospectively analysed for the following variables; age, date of birth, operation date, number of drains, drainage volume by day, day of hospital discharge, day of drain removal and donor-site complications including seroma, flap-related or systemic complications. Definitions were as follows; haematoma (a post-operative collection due to the extravasation of blood requiring surgical evacuation), seroma (a post-operative collection of a fluctuant mass yielding straw-coloured serous fluid requiring aspiration), dehiscence (post-operative wound separation due to any underlying cause). Seroma sub-analysis of the following variables was also undertaken prior to resolution; number of seroma aspirations, duration of drainage and mean total drainage. When more than 1 back drain was removed on the day of drain removal, output was added for each drain and recorded accordingly. If patients were discharged with drains *in situ*, after appropriate drain care education, they telephoned the ward daily for nurse-led drain output recording. Patients were then recalled for drain removal once output had reached target drainage volume over 24 h. Statistics were analysed using SPSS with *t*-tests for parametric continuous data and Chi^2 tests for discrete data.

Results

There were 81 patients who underwent unilateral LD breast reconstructions all of whom were followed up for a minimum of 1 year. Operations were performed, in standard manner without use of donor site adjunct techniques e.g. quilting, by 8 consultants, 4 of whom had patients with drain removal instructions by day 3. There were 78 sets of hospital records and plastic surgery dressing clinic notes with complete documentation. The average age of patients enrolled was 52.67 ± 1.50 years (Mean ± SEM), their hospital stay was 4.23 ± 0.14 days and they had drains removed at 4.44 ± 0.18 days.

There were 48 patients in the late drain removal group (52.5 ± 2.19 years) and 30 patients in the early group (52.83 ± 2.07 years) and both groups were matched for age ($p = 0.91$) and number of drains; (77.08% (34/48) vs. 56.67% (17/30)), and (22.92% (11.48) vs. 43.33% (13/30)) of patients in the late vs. early groups had 1 or 2 drains