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Breast cancer surgery without suction drainage: The impact of adopting a 'no drains' policy on symptomatic seroma formation rates

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Abstract

Aim: To determine the effect of a 'no drains' policy on seroma formation and other complications in women undergoing breast cancer surgery.

Materials and methods: Before May 2010 drains were routinely used in our unit following mastectomy ± axillary surgery and axillary lymph node dissection (ALND) ± wide local excision (WLE). Since then, a 'no drains' policy has been adopted. Data was collected prospectively between 01/12/06 and 30/11/11 to compare symptomatic seroma, wound infection, re-admission and re-operation rates in women treated with a drain and those without.

Results: 596 women were included in the study. 247 women underwent modified radical mastectomy (MRM) and ALND (Group 1), 184 MRM ± sentinel lymph node biopsy (SLNB)/axillary node sampling (ANS) (Group 2) and 165 ALND ± WLE (Group 3).

In group 1, 149 had a drain, in group 2, 62, and in group 3, 50.

Within each group, the presence or absence of a drain did not significantly affect the rate of symptomatic seroma, number of aspirations performed, wound infection rates or the incidence of complications requiring re-admission. Having a drain was associated with lower volumes of seroma aspirated. In all three groups, the presence of a drain was associated with a longer hospital stay ($p < 0.001$).

Conclusion: This study suggests that MRM ± ALND/SLNB/ANS and ALND ± WLE can be performed without the use of suction drains without increasing seroma formation and other complication rates. Adopting a 'no-drains' policy may also contribute to earlier hospital discharge.

Keywords: Breast cancer; Mastectomy; Seroma; Drainage; Suction

Introduction

Breast cancer is the most common malignancy in women in the UK, with 49,000 new cases diagnosed each year.[1] The standard surgical management of most women with operable breast cancer is excision of the primary tumour by wide local excision (WLE) or modified radical mastectomy (MRM) and sentinel lymph node biopsy (SLNB) or axillary lymph node dissection (ALND) to achieve locoregional control, staging and accurate prognostication.[2]

Seroma formation remains the most common early complication after breast cancer surgery, with reported incidence ranging from 15% to greater than 85%.[3–7] Seroma may cause discomfort, in addition to impairing wound healing, and may delay the start of adjuvant therapy.

Despite no clear evidence that the use of closed-suction drains significantly reduces seroma formation,[8] closed-suction drainage deep to the skin flaps after mastectomy, and to the axilla after ALND is standard practice in most breast units in the U.K. Practice varies widely from unit to unit in terms of how long suction drains remain *in situ* and whether patients remain in hospital until all drains are removed, or are discharged with community nursing support and early breast clinic attendance for drain removal.[9]

The number of drains used also varies, from single to multiple, although there is evidence that following mastectomy, two drains are no more effective than one at reducing

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seroma formation, but one drain is less painful and is associated with a shorter duration of inpatient hospital stay.[10]

A recent review of published literature concerning seroma prevention in breast cancer surgery concluded that of all the proposed techniques (suction drainage,[11] quilting,[12] ultrasonic dissection,[13] tetracycline sclerotherapy,[14] external compression dressing,[15] delayed shoulder exercises[16] and fibrin sealant[17]), only quilting of the mastectomy skin flaps to reduce the dead space was successful.[18]

The majority of reported studies have shown drains to be associated with increased patient discomfort and longer hospital stay, without clear benefit in reducing seroma or other complications.

A recent systematic review of 6 randomized controlled trials, containing 585 women having ALND, found a significant reduction in seroma formation rate, in addition to fewer aspirations required and lower volumes aspirated when drains were used after ALND.[19] An audit within our department of a small sample of women operated on after implementing a 'no drains' policy did not correlate with these published results, and led to the present study.

Aims of this study

To date, no published work has analysed the impact of stopping closed-suction drain use completely in all women undergoing non-oncoplastic breast cancer surgery in a single breast unit.

We hypothesised that women undergoing breast cancer surgery can be treated using a 'no drains' policy without increased rates of symptomatic seroma and other complications. This would avoid the pain and inconvenience associated with closed-suction drains previously reported.

Materials and methods

Prospective data was collected on all women treated surgically for breast cancer presenting via screening and symptomatic breast clinics in our unit from December 2006 to December 2011. This data included patient demographics, social circumstances, medical co-morbidity, type of surgical procedure, use of suction drain, duration of suction drainage, volumes drained prior to drain removal, symptomatic seroma rate, number of aspirations of seroma and rates of other complications (wound infection, infected seroma, chronic seroma and haematoma requiring re-operation).

Eligibility criteria

All women undergoing MRM + ALND, MRM ± SLNB or ANS and ALND ± WLE in this five year time period were included in the study.

All women undergoing procedures in which suction drains were never routinely used in our department (WLE ± SLNB or stand-alone SLNB) were excluded, as were women undergoing mastectomy and immediate breast reconstruction or therapeutic mammaplasty.

Definitions

Symptomatic seroma was defined as a palpable fluid accumulation causing discomfort and requiring at least one aspiration.

Wound infection was defined as clinical features of infection (erythema, increased pain and tenderness, increased exudate and delayed healing or wound breakdown), purulent discharge or microbiological evidence of infection.

Our breast unit

All of the women included in this study had their surgery performed under the care of three breast surgeons at Birmingham City Hospital, UK. Our unit treats over 300 new breast cancer patients per year, with roughly half of this number presenting via the NHS Breast Screening Programme and half via symptomatic breast clinics. The hospital serves an ethnically diverse, economically deprived, inner city population.

All surgical procedures were performed under general anaesthetic by a specialist breast surgeon, or senior trainee. Surgical technique is standardised within the unit, with dissection performed using monopolar diathermy. Interrupted absorbable dermal sutures (3/0 Monocryl™, Ethicon) and continuous absorbable subcuticular sutures (3/0 Monocryl™, Ethicon) are used for wound closure, but no attempt is made to close the dead space deep to the mastectomy skin flaps or in the axilla after ALND. Wounds are dressed with ½" white steri-strips (Nexcare) and a transparent waterproof dressing with an absorbent lattice pad (Opsite Post Op, Smith & Nephew Plc.).

In those women who had drains sited, size 10Fr Redivac® drains were used and sutured in place with a 2/0 non-absorbable braided suture (Mersilk™, Ethicon) drain stitch. Drains were removed after surgery when output was less than 50 mL per 24 h, or on day 7.

All patients undergoing MRM, and those in whom ALND is performed, are given a standardised post-operative analgesia pack consisting of Co-Codamol ± Ibuprofen and a patient-information booklet which includes exercises to be started on post-operative day 7. Patients are able to contact a specialist breast care nurse, or one of the breast surgical team, if they are at all concerned, and are seen in the next available breast clinic for review and intervention as necessary.

Statistical analysis

Continuously variable data distributed normally is presented as mean and standard deviation and was analysed by *t* test. Data distributed non-normally is presented as median and inter-quartile range (IQR) and was analysed by the