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ORIGINAL ARTICLE

Pressure dressing in breast surgery: is this the solution for seroma formation?

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Summary

Purpose: *Pressure dressing (PD) after modified radical mastectomy (MRM) for breast cancer is investigated here as an easy-to-apply method to reduce seroma formation and subsequent need for clinical care.*

Patients and methods: *Two hundred mastectomized patients who were treated with PD on the skin flaps and the axilla immediately postoperatively (group A) were compared with a similar non-PD group (B). Surgical technique and perioperative care were the same. Drains were removed when drain output was reduced to 30 ml per day, or on postoperative day 8 regardless of output.*

Results: *Mean time with drains kept in situ was 4.9 and 5.5 days in group A and B, respectively. Five (2.5%) patients in group A and 16 (8%) in group B developed seromas after the removal of the drains. In total, 9 seroma needle aspirations were performed in group A and 26 in group B. Differences were statistically significant.*

Conclusion: *Our findings are supportive of PD as an effective, cheap and easy-to-apply method for the reduction (a) of the time with drains in situ after MRM, (b) of the number of patients developing seromas and (c) of the seroma aspirations. This can potentially reduce further complications, needed medical care and cut expenditure.*

Key words: breast cancer, drain, mastectomy, pressure dressing, seroma

Introduction

Seroma, the most frequent early complication after breast surgery, can not only compromise the optimal care to the patient but increase the health care cost as well. Seroma formation can delay further treatment, predispose to more severe complications and requires further medical attention and postoperative clinic visits. Furthermore, apart from the medical implications, with the escalating cost of health provision, any surgical technique or clinical practice that could reduce the need for postoperative health care assistance and thereby cut expenditure would be welcomed. In this study we attempt to present our experience on PD after MRM for breast cancer as an easy means to (a) reduce the time the drains need to be kept *in situ*, (b) reduce the number of patients that develop seroma one or more times and (c) reduce the number of seroma aspirations. PD is simple and cheap, could be easily adopted widely and fit into different guidelines applied by different breast units, as it does not interfere with the rest of the patient care.

Patients and methods

For the assessment of the PD impact on the seroma formation two female patient groups were compared. Two hundred consecutive MRM patients operated on after June 2000, when PD started being applied as a guideline, formed group A, while group B included 200 consecutive MRM patients treated immediately prior to this date.

Patients' notes were reviewed and age, body mass index (BMI), number of resected and affected lymph nodes, wound complications, time with the drains kept *in situ* and seroma formation and aspirations for seroma

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drainage were recorded. Volume of the first aspiration was also compared between groups.

All patients were operated on by the same surgical team and had MRM with level III axillary clearance. Two to three vacuum drains were placed in all patients of both groups: one under the inferior skin flap of the mastectomy site and the other(s) in the axilla. PD was applied on group A patients over the skin flaps and under the axilla using simple gauzes and adhesive tape. Care was taken that arm movements and arm vein drainage were not compromised. PD was kept on until postoperative day 5. Simple adhesive dressings were used for group B. Drains were removed after daily output was reduced to 30 ml. If drainage persisted on day 8, drains were removed regardless of output.

After the removal of the drains patients were seen on an outpatient basis and all palpable seroma collections were recorded and aspirated to dryness. The volume of the aspirated collections was not always recorded at the time and only the volume of the first aspiration was available from the patients' notes because of an ongoing audit at the time. Patients who recurred were aspirated for a second time. Those who presented for third time with a persistent collection were aspirated only when the estimated volume was larger than 50 ml.

Simple x^2 and Student's t-test were used for the statistical evaluation.

Table 1. Time with drains *in situ*

Days	*Group A Patients, n (%)*	*Group B Patients, n (%)*
2	2 (1)	1 (0.5)
3	15 (7.5)	24 (12)
4	59 (29.5)	27 (13.5)
5	78 (39)	44 (22)
6	30 (15)	46 (23)
7	6 (3)	40 (20)
8	10 (5)	18 (9)

Mean time 4.9 and 5.5 days for group A and B, respectively ($p<0.001$)

Table 2. Volumes of seroma collections at first aspiration

Group A		*Group B*	
Aspirated volume per patient (ml)	*No. of patients*	*Aspirated volume per patient (ml)*	*No. of patients*
65	1	260	1
40	1	100	6
20	2	80	2
15	1	50	5
		15	2
Total 160*	5§	1150*	16§

*$p=0.075$ §$p=0.014$

Results

There was no overall difference in regard to the patients' age, BMI, number of the affected and removed lymph nodes or wound complications.

Mean time with drains *in situ* was 4.9 and 5.5 days in group A and B, respectively (range 2 - 8 for both groups) ($p<0.001$) (Table 1). Five patients in group A and 16 in group B developed seromas after removal of the drains ($p=0.014$). All of them were aspirated to dryness and among them 4 patients in group A and 9 in group B recurred. One group B patient recurred for a second time. In total 9 seroma aspirations were performed in group A and 26 in group B ($p=0.031$). Volumes of the first aspirations are summarized in Table 2 ($p = 0.075$).

Discussion

This study demonstrates the effect of PD on the postoperative course of mastectomy patients. Our findings are supportive of PD as an effective, cheap and easy-to-apply method for the reduction of the time drains have to be kept and the number of aspirations for seroma draining after MRM for breast cancer.

Seroma formation is often regarded as a "nuisance" and not as a real complication; however, it can result in delays of the subsequent adjuvant treatment, (chemo- or radiotherapy) [1-3]. It can also be the cause of discomfort, delayed wound healing and wound dehiscence, infection, decreased limb mobility, arm swelling, flap necrosis, increased numbers of postoperative clinic visits and psychological morbidity [4-6]. Therefore, despite the usually benign course of seromas, both doctors and patients would welcome a way to eliminate them, especially if the available method is cheap and easy-to-apply.

Realizing the importance of the problem, a number of methods have been proposed to address it, such as suturing flaps, mechanical pressure, use of fibrin sealant, restriction of shoulder movement, closed wound drainage, use of different number of drains or use of varying degree of suction pressure. Early drain removal or no placement of drains at all have been looked into in an attempt to reduce patient's hospital stay. In a systematic review of these methods none of them was found to provide a solution to the problem [7]. Furthermore, discharge of the patients with the drains *in situ* can cause discomfort, is not convenient,

especially for elderly patients, and can potentially increase the likelihood of infection [8].

Ultrasonic dissection has also been investigated as a means for the reduction of seroma rates but quite heterogeneous results have been reached by different researchers [9-11]. Our experience with harmonic scalpel is that the slight reduction on seroma formation rates it produces does not compensate for the higher cost of the disposable part of the instrument and therefore its use is not warranted.

The basis of the PD idea is the elimination of the "dead space" by adhering the flaps down to the underlying muscle, facilitating the early formation of adhesions that will permanently fill the gap and prevent seroma formation. At least two previous attempts have been made to evaluate the efficacy of external pressure after breast surgery [12,13] but with quite heterogeneous results.

Chen et al. [12] reported no improvement in postoperative drainage and an actual increase of the duration of the use of the drain with the use of a pressure garment. However, there were more complications in the group without the pressure garment. The only seroma occurred in those patients not using the garment and differences in the two groups were not significant.

In another randomized trial O'Hea et al. [13] reported nearly identical wound drainage in both groups (compression vs. standard) and similar total days with drains. A statistically significant increase in the number of seroma aspirations per patient in the compression group was also found.

However, our results show that PD can be beneficial. A reduction of a mean 0.6 days in the time with drains *in situ* per patient, a decrease of 17 seroma aspirations in 200 patients and a reduction of the number of patients that developed seromas one or more times by 11 were statistically significant. Although these differences are not large, their significance lies in the high frequency of the complication: even a small change in a frequent event has great impact on the outcome. The importance of this result is further augmented due to the very cost of the PD.

PD is a simple technique and can be applied easily in every breast unit, as it does not interfere with the rest of the treatment plan. Even if early removal of drains or placement of no drains at all is advocated, PD could still be used. Similarly, if patients are discharged early, they can ambulate with PD at home.

References

1. Say CC, Donegan W. A biostatistical evaluation of complications from mastectomy. Surg Gynecol Obstet 1974; 138: 370-376.
2. Dalberg K, Johansson H, Signomklao T et al. A randomised study of axillary drainage and pectoral fascia preservation after mastectomy for breast cancer. Eur J Surg Oncol 2004; 30: 602-609.
3. Jain PK, Sowdi R, Anderson ADG, McFie J. Randomized clinical trial investigating the use of drains and fibrin sealant following surgery for breast cancer. Br J Surg 2004; 91: 54-60.
4. Schuijtvlot M, Sahu AK, Cawthorn SJ. A prospective audit of the use of a buttress suture to reduce seroma formation following axillary node dissection without drains. Breast 2002; 11: 94-96.
5. Aitken DR, Nunsacker R, James AG. Prevention of seromas following mastectomy and axillary dissection. Surg Gynecol Obstet 1984; 158: 327-330.
6. Bonnema J, van Wersch AM, van Geel AN et al. Medical and psychological effects of early discharge after surgery for breast cancer: randomised trial. BMJ 1998; 316: 1267-1271.
7. Pogson CJ, Adwani A, Ebbs SR. Seroma following breast cancer surgery. Eur J Surg Oncol 2003; 29: 711-717.
8. Coons MS, Folliguet TA, Rodriguez C, Woloszyn TT, Tuchler RE, Marini CP. Prevention of seroma formation after dissection of musculocutaneous flaps. Am Surg 1993; 59: 215-518.
9. Deo SV, Shukla NK, Asthana S, Niranjan B, Srinivas G. A Comparative Study of Modified Radical Mastectomy Using Harmonic Scalpel and Electrocautery. Singapore Med J 2002; 43: 226-228.
10. Lumachi F, Brandes AA, Burelli P, Basso SM, Iacobone M, Ermani M. Seroma prevention following axillary dissection in patients with breast cancer by using ultrasound scissors: a prospective clinical study. Eur J Surg Oncol 2004; 30: 526-530.
11. Galatius H, Okholm M, Hoffmann J. Mastectomy using ultrasonic dissection: effect on seroma formation. Breast 2003; 12: 338-341.
12. Chen CY, Hoe AL, Wong CY. The effect of a pressure garment on post-surgical drainage and seroma formation in breast cancer patients. Singapore Med J 1998; 39: 412-415.
13. O'Hea BJ, Ho MN, Petrek JA. External compression dressing versus standard dressing after axillary lymphadenectomy. Am J Surg 1999; 177: 450-453.