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COMPARISON OF FOUR-DAY AND TEN-DAY POST-MASTECTOMY PASSIVE DRAINAGE IN ACCRA, GHANA
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COMPARISON OF FOUR-DAY AND TEN-DAY POST-MASTECTOMY PASSIVE DRAINAGE IN ACCRA, GHANA

J. N. A. CLEGG-LAMPTEY, J. C. B. DAKUBO and W. M. HODASI

ABSTRACT

Objectives: **To determine the optimum period for passive post-mastectomy drainage in Accra, Ghana, comparing early (day 4) to late (day 10) drain removal.**
Design: **Randomised prospective clinical study.**
Setting: **Surgical Department, Korle Bu Teaching Hospital, Accra, Ghana**
Subjects: **Patients with breast cancer scheduled for total mastectomy and level 11 axillary clearance.**
Interventions: **Patients were randomised to one of the two groups: early (day 4) and late (day 10) passive drainage.**
Main outcome measures: **Duration of hospital stay, seroma formation and post-operative wound infection.**
Results: **Forty five patients had 4-day drainage and 42 had 10-day drainage. Late removal of drains (Day 10) was associated with a significantly higher drainage (1123ml) than those with early (4-day) drain removal (571 ml); p=0.0019. Late removal, however, had fewer seromas (28.6% vs. 46.7%; p=0.2), smaller aspirate volumes (435ml vs. 563ml) and fewer number of aspirations (2.1 vs. 3.2). Early removal had a shorter hospital stay of 6.2 (±1.52) days compared to 11.07 (± 0.76) days for late removal, and a lower wound infection rate (2.2% vs. 9.5%). There was a low incidence of seromas when drainage was <30 ml/day at the time of drain removal.**
Conclusions: **Post-mastectomy passive drains may be removed when drainage is <30 ml in 24 hours. When there is a persistent large volume of axillary drainage, patients should be counselled about the relative risks of early and late drain removal. For patients who do not find seroma aspiration unacceptable, early (day 4) removal appears preferable to late (day 10) removal of drains.**

INTRODUCTION

Mastectomy and axillary clearance is a standard surgical intervention used in the treatment of many patients with breast cancer. There has, however, been controversy about certain aspects of the operation: the ideal method of dissection (1,2), type of drain (e.g. suction, low suction or passive),(3) number of drains used (4) and duration of drainage (5). Although many surgeons employ the use of two suction drains after mastectomy and axillary clearance recent studies have shown no difference between suction and passive drains (6). It has also been shown that a single drain in the axilla is as effective as using two drains and may even have the additional advantage of preventing flap necrosis caused by the pectoral drain (7).

Seroma formation is the main risk of early post-mastectomy drain removal (8). Many surgeons remove mastectomy and axillary clearance drains

when the daily drainage reduces to about 30ml (5). Standard times (number of days post-operation) for removing drains, however, remain a matter of controversy and some previous studies have compared early drain removal to late removal, with conflicting results of seroma formation (5, 8-11). The optimum time for drain removal in the West African sub region has not been studied. We carried out a randomised prospective study in a large teaching hospital to compare the outcomes of early (day 4) and late (day 10) removal of passive mastectomy and axillary clearance drains. The main outcome measures were duration of hospital admission, wound infection and seroma formation (amount and number of aspirations).

MATERIALS AND METHODS

Patients scheduled for total mastectomy and level II axillary clearance in the teaching hospital were included in this study. Inclusion criteria used were:

(i) Histologically proven invasive carcinoma of the breast.
(ii) Mastectomy and level II axillary clearance performed at the same operation.
(iii) Patients who had had neoadjuvant therapy were not excluded.

Exclusion criteria were as follows:

(i) Patients having breast conservation surgery.
(ii) Patients with prior wide local excision
(iii) Patients with prior axillary dissection.
(iv) Patients having other types of axillary clearance apart from level II clearance.

At surgery, patients at risk of infection (e.g. those who had received neoadjuvant chemotherapy) were given broad spectrum prophylactic antibiotics. Electrocautery was used in the dissection of skin flaps. During axillary clearance the pectoralis minor was retracted to enable dissection of level II nodes/fat. The subscapular vessels and thoracodorsal nerve supplying latissimus dorsi muscle were preserved, as was the long thoracic nerve that innervates serratus anterior muscle. Haemostasis was secured using ligatures and diathermy. A single tube drain was inserted in the axilla and the wound closed in a single layer. The drain was then connected to a collection bag without suction.

Patients were randomised to two groups: drains to be removed on the 4th or 10th operative day. The drainage of blood/serum was tabulated daily and the drainage tube removed on the day assigned. The patients were discharged after drain removal and reviewed over the next 30 days for evidence of seroma formation, defined as the presence of a fluctuant swelling in the pectoral or axillary region. Seromas were aspirated and volumes documented. Patients with seromas were maintained on the study until there was no further collection. Signs of infection were noted and the infections treated appropriately.

Data was compiled and analysed with Microsoft Excel. Statistical analysis was by Epi Info stalcalc.

RESULTS

Eighty seven patients, aged between 30 and 75 years were randomised to 4-day drainage (45 patients) and 10-day drainage (42 patients). The two groups had similar characteristics (Table 1).

Table 1
Patients' characteristics

	Number	Age range (years)	Mean age (SD)	BMI (range)
Day 4	45	30-68	48.5 (9.95)	16-39
Day 10	42	30-75	49.5(11.48)	20-39

In patients with early drain removal (Day 4), the mean volume drained over the four days was 571 ml (range 150 to 1750 ml). Mean duration of hospital stay was 6.2 days ±1.52 SD (range 4 to 9 days) after surgery. Twenty one patients developed seromas (46.7%) that were aspirated. Mean number of aspirations was 3.2, with a mean total aspiration volume of 563 ml. There was wound infection in one patient (2.2%).

In patients with late drain removal (Day 10) the average volume drained was 1123 ml (range 320 to 2870 ml). Patients were in hospital for 11.07 days ±0.76 SD (range 10 to13 days) after surgery. There were seromas in 12/24 patients (28.6%), with a mean number of 2.1 aspirations and volume of 435 ml. There was wound infection in four patients (9.5%).

Seromas formed in three of 14 patients (21.4%) whose 24-hour drainage was less than 30 ml at the time of drain removal. There were 30 seromas in the other 73 patients (41.1%) who had daily drainage more than 30 ml at the time of drain removal. Seromas did not result in a delay in initiating adjuvant chemotherapy in any of the patients. The patients complained of little or no pain during seroma aspiration and tolerated the procedure well.

Wound infections were treated by appropriate antibiotics and dressings. There was a delay in initiating adjuvant chemotherapy in four out of the five patients with wound infection.

DISCUSSION

Breast cancer is the leading malignancy affecting women in Ghana and the majority present with advanced disease (12). Some of these patients with locally advanced disease receive neoadjuvant chemotherapy, and when indicated surgery is complemented by appropriate adjuvant treatment: chemotherapy, radiotherapy, hormonal therapy or occasionally immunotherapy. The surgical treatment of these advanced tumours often involves mastectomy rather than breast conservation surgery. pectoral and axillary regions after mastectomy and axillary dissection in this teaching hospital. The authors currently employ a single axillary drain, as it has been shown to be as effective as two (7). Suction drains are generally unavailable in our low resourced environment. Passive siphon drainage has, moreover, been shown to be as effective as suction drainage after axillary surgery (6). In this study, therefore, we used a single axillary passive drain in all patients.

While many agree drains may be removed once the daily output is about 30mls (5) randomised studies comparing early and late removal of drains show conflicting results (Table 2). There is also no agreement as to what constitutes early or late removal, as can be seen in previous studies. There is no policy in this hospital concerning when to remove mastectomy drains. This study compares early (day

Table 2
Randomised studies comparing early and late drain removal

Author	Day of early removal	Day of late removal	Conclusion
Gupta R. *et al* (8)	5	8	Early removal is as safe as late removal
Parikh H.K. *et al* (9)	3	6	No difference between the mean volumes of seromas or number of aspirations
Barton A. *et al* (10) occurrence	2	l4	Early removal significantly increases of seromas
Kopelman D. *et al* (11)	3	Daily drainage <35ml	Early removal significantly increases occurrence of seromas

The management of the post-mastectomy drain affects patients in a number of ways. First, it determines the duration of hospital admission, as patients are reluctant to leave with their drains *in situ*. When removed too early, it may result in seroma formation which can lead to morbidity and cause delay in initiating some forms of adjuvant therapy (13). In our experience such delays cause anxiety to both the patient and the medical staff. Wound infection, like seroma formation, also leads to delay in initiating adjuvant therapy. This study therefore sought to determine the effect of early or late drain removal on duration of hospital stay, wound infection and seroma formation.

Seromas are common after mastectomy and axillary clearance and have been called a "necessary evil"(l4). Drains have been used to minimise their occurrence, although they still occur in numbers similar to our findings in this study(13,15). Traditionally two drains have been used to drain the 4) removal to late (day 10) removal. Whereas previously cited studies have been carried out with suction drains this study compares early and late drain removal of a single passive siphon drain.

The patients with late drain removal had a significantly higher drainage (1123ml) than those with early removal (570.6ml) p=0.0019. Compared to early removal, late removal was associated with a longer hospital stay (11.26 versus 6.8 days). This was expected as the patients were reluctant to leave hospital with drains *in situ*.

Seromas were more frequent after early drain removal [21/45 (46.7%)] compared to late removal [12/42 (28.6%)] p = 0.2. This is consistent with other reports (8,10,11,15). The seromas after early drain removal were of a greater volume and they had a greater number of aspirations (3.2 compared to 2.1). As was observed by a study on women's perceptions of seroma and their drainage (16), our patients had little or no pain and anxiety during the aspiration

and found the procedure acceptable. Patients who developed seromas suffered no delay in initiating adjuvant chemotherapy; an observation similar to a previous study on factors related to seroma formation (14). Seroma formation should therefore not be considered a disaster when it occurs.

Seromas were fewer when the drainage was less than 30 ml at the time of drain removal, irrespective of whether they were removed early or late, similar to previous reports using suction drains (5).

One of the main complications of seroma aspiration, especially when done repeatedly, is infection (17). In spite of the greater seroma volumes and the more frequent aspiration, early drain removal was associated with a lower infection rate than late removal. Thus a long period of drainage posed a greater risk of wound infection than seroma formation and aspiration. This observation is consistent with reports that wound related complications is higher after long-term drainage (15). There was a delay in initiating adjuvant chemotherapy in patients who developed infection, in addition to the anxiety posed to patients and doctors. Compared to seroma, therefore, infection proved to have more serious consequences after mastectomy.

The number of patients with seromas following the use of passive drains in this study compares favourably with other studies that employed suction drains (5, 13-15). This confirms the view that passive drains may be as effective as suction drains after mastectomy and axillary clearance (6).

In conclusion there is a low incidence of seromas when daily drainage is less than 30 ml at the time of drain removal, regardless of the timing of removal. Early drain removal is associated with early discharge from hospital and lower risk of infection; the disadvantages are higher (though insignificant) risk of seroma formation that may be aspirated a greater number of times. Late drain removal is associated with less seroma formation but with a longer hospitalisation and infection which may interfere with the initiation of adjuvant chemotherapy. We recommend that passive drains are removed when the daily drainage is 30 ml or less. When there is a persistent large volume of axillary drainage, patients should be counselled about the relative risks of early and late drain removal. For patients who do not find seroma aspiration unacceptable, early (day 4) removal is preferable to late (day10) removal.

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