

A comparative study of half versus full negative suction drainage after MRM for breast cancer

¹Dr. Ashok Ganiger S, ²Dr. Jambukala AY, ³Dr. Usharani SD, ⁴Dr. Mahadevaswamy KM

¹Senior Resident, Department of General Surgery, GIMS, Gadag, Karnataka, India

^{2,3}Senior Resident, Department of General Surgery, RIMS, Raichur, Karnataka, India

⁴Assistant Professor, Department of General Surgery, CIMS, Chamrajnagar, Karnataka, India

Corresponding Author: Dr. Mahadevaswamy KM

Abstract

When no postoperative suction drains were used the incidence of seromas was found to be unacceptably high in various studies. Prolonged drainage on the other hand, may increase the hospital stay and increase the risk of infection by allowing retrograde migration of bacteria. Indiscriminate or premature withdrawal of postoperative drains irrespective of the amount of fluid drained may be accompanied by an increase in the incidence of axillary seromas. This comparative study was conducted in Department of Surgery in which FNAC/Core biopsy proven cases of breast cancer were randomized using randomly ordered sealed envelopes, which were opened immediately before the closure of the wound, into two groups having 20 cases each. All patients with clinical suspicion of Breast cancer underwent Core needle biopsy. Patients with core needle biopsy proven malignancy were admitted one day prior to surgery. All patients underwent complete routine and metastatic workup and were posted for MRM. Wound complications included marginal flap necrosis in one patient of group A which required refreshing of wound margin under local anesthesia. Surgical site infection was noted in 2 patients of group A and group B. All of them were managed by daily dressing with povidone iodine containing solutions and no resuturing was required. Seroma formation was noted in 2 in group A and 1 in group B, two of which spontaneously resolved and one patient in group A required repeated seroma aspirations which were done on outpatient basis.

Keywords: Half versus full negative suction drainage after MRM for breast cancer

Introduction

Suction drainage in the management of mastectomy patients was used for the first time in 1947^[1] and has been found in various studies superior to other methods of fluid evacuation to minimize the dead space. The mechanism proposed is that the suction helps skin flaps to adhere to the chest wall and axilla sealing off all the leaking lymphatics^[2,3]. This reduces the incidence of post-operative seromas, hematoma formation and flap necrosis which are recognized complications of modified radical mastectomy^[2,3]. When no postoperative suction drains were used the incidence of seromas was found to be unacceptably high in various studies^[4]. Prolonged drainage on the other hand, may increase the hospital stay and increase the risk of infection by allowing retrograde migration of bacteria^[4]. Indiscriminate or premature withdrawal of postoperative drains irrespective of the amount of fluid drained may be accompanied by an increase in the incidence of axillary seromas^[4,5,6]. If kept for longer periods it has been observed that drain itself might contribute to increased drainage and the risk of infection in addition to the increased hospital stay resulting in to wasteful utilization of the hospital resources. The amount of postoperative drainage is influenced by various factors like the clinical profile of the patient including the body mass index, extent of axillary lymph node dissection, number of lymph nodes dissected, use of electrocautery, co morbid conditions and also the negative pressure on the suction drain^[4,5,6]. The amount of

postoperative fluid drained has been found to be significantly influenced by the negative pressure on the suction drainage. While the negative suction drain is logically expected to drain the fluid, a high negative suction drain may prevent the leaking lymphatics from sealing off thus leading to prolonged drainage leading to increased hospital stay^[4].

Methodology

This comparative study was conducted in Department of Surgery in which FNAC/Core biopsy proven cases of breast cancer were randomized using randomly ordered sealed envelopes, which were opened immediately before the closure of the wound, into two groups having 20 cases each.

- **Group A:** Full vacuum suction (pressure = 700 g/m²).
- **Group B:** Half vacuum suction (pressure = 350 g/m²).

The two groups were comparable in respect of age, weight and type of operation i.e., modified radical mastectomy (MRM).

Inclusion criteria

- Age > 18 years and < 60 years.
- Core Needle Biopsy Proven Breast Cancer.
- Locally advanced Breast Cancer.
- Patients who give consent to be a part of the study.

Exclusion criteria

- Male Breast Cancer.
- Metastatic Breast Cancer.
- Malignancies other than Ductal or Lobular carcinoma of Breast.
- History of previous breast cancer or chemoradiation.
- Patients who opt out of the study.

All patients with clinical suspicion of Breast cancer underwent Core needle biopsy. Patients with core needle biopsy proven malignancy were admitted one day prior to surgery. All patients underwent complete routine and metastatic workup and were posted for MRM. The details of the patients were recorded in a predetermined proforma. An informed and written consent was taken for the surgery and the study.

Pre-Operative Preparation included

- Part Preparation.
- Shaving of both axilla.
- T. Anxit 0.5mg and T. Rantac 150mg on the previous night of surgery.

Type of Anaesthesia: GA with/without Epidural.

Inj. Ceftriaxone 1g I.V was given within 30 min prior to the incision.

Surgery: Surgery was performed using a standardized technique with electrocautery.

Results

The total number of patients included in the study was 40. Number of patients in Group A (Full vacuum suction) was 20. Number of patients in Group B (Half vacuum suction) was 20. Randomization was done by lottery method, with the group and the intervention to be done assigned just prior to the closure of the wound in each case. The base-line characteristics like

the Age and BMI of the two groups were comparable indicating the success of randomization.

The average BMI of patients in Group A was 26.245 while that of patients in Group B was 25.955. The mean age of patients in Group A was found to be 47.1 and that in Group B was found to be 46.3 years.

The baseline characteristics like BMI and age are considered to indicate the distribution of cohorts, and when matched between them, it is hoped the other characteristics are also equally distributed among the two groups thus minimizing the bias arising from the unequal distribution of unknown factors that may influence the outcome under study, as in our study the total fluid drained and seroma formation.

Table 1: Mean Total Drain Output (mL)

Age (years)	Group A	Group B
18-30	580	265
31-40	782.50	295
41-50	756.11	340
>50	759.17	318.57

The mean of the total volume of fluid was lowest in the younger age group (18-30) of both the age groups. The volume drained steadily increased in the age groups 31-40 and 41-50 years of Group A, but slightly falling in >50 years of age. In Group A, the volume drained did not show any consistent relationship with age. When both groups were compared, the total volume drained was significantly lower in Group B.

Table 2: Body Mass Index of Patient V/S Mean Total Drain Output of the Patients in Both the Groups

BMI (kg/m ²)	Mean Total Drain Output (mL)	
	Group A	Group B
21-22.9	758.33	250
23-24.9	740	332.86
25-26.9	741	297.5
≥27	761	318.75

With increasing BMI, the drain output did not vary much within both groups in our study.

Table 3: Clinical Stage of Breast Carcinoma V/S Mean Total Drain Output

Clinical Stage	Mean Total Drain Output (mL)	
	Group A	Group B
I	750	290
IIA	749.29	316.67
IIB	727.86	305.45
IIIA	807.5	357.5

The total volume of fluid drain was higher in Stage IIIA for both groups, but didn't vary much in the other stages; however as seen previously total volume fluid drain was significantly lower in group B.

The average number of days the patient had to be kept inpatient, for the drain output to fall to >50ml per day so that the patient to be discharged was 10.55 in group A while significantly less in group B showing the same to be 5.95.

The average amount of fluid drained in group A was found to be 735.5, much higher compared to group B for which it was 316.

Table 4: Complications

	Group A	Group B
Flap Necrosis	1	0
Surgical site infection	2	2
Seroma	2	1
Seroma aspiration	1	0

Wound complications included marginal flap necrosis in one patient of group A which required refreshing of wound margin under local anesthesia. Surgical site infection was noted in 2 patients of group A and group B. All of them were managed by daily dressing with povidone iodine containing solutions and no resuturing was required. Seroma formation was noted in 2 in group A and 1 in group B, two of which spontaneously resolved and one patient in group A required repeated seroma aspirations which were done on outpatient basis.

Discussion

The use of closed suction drainage is a common practice that has been shown to reduce the incidence of seroma formation ^[1,2].

These drains are generally removed once the lymph production falls to less than 35-50 ml/24 hours, a level generally reached between 3-17 days after surgery ^[1].

The length of postoperative axillary drainage is a major cause of morbidity after axillary dissection as the patients are usually discharged once the drains are removed.

The patients with suction drains in situ are normally managed in the hospital (although some authors advocate discharge with the drains in situ). Migration of bacteria along these drains has also observed to increase the risk of infection if the drains stay in situ for a long time.

Early or premature removal however has been found to be associated with an unacceptably high incidence of seroma formation and its continuation until fluid discharge is acceptably low leads to a prolonged stay in the hospital, which has a bearing on the cost of surgical management of breast cancer.

Shortening the hospital stay has been shown to be an effective way of reducing the costs in the case of surgery for breast cancer and axillary drains are the main obstacles in achieving it ^[7, 8].

To reduce the hospital stay after MRM, early discharge with the drains in situ has been reported but discharging patients with drains in situ has an inherent difficulty faced by the patients in management of drains besides higher incidence of wound infection.

The other disadvantages are discomfort for the patients, with difficulties undressing or using the toilet.

It may be feasible with patients of higher cultural and social standing, but not all the patients have the required background. In a third world country where the patients are poor, uneducated coming from far and remote areas with limited medical facilities, there is an added difficulty in management of the drains away from the hospital. As most of our patients come from far flung rural areas with limited education, poor medical and communication facilities they were managed indoors until the drains were removed.

There are other solutions proposed for prevention or reduction of fluid accumulation and early discharge after axillary dissection e.g. by Patrek *et al.* ^[9] where several parallel drains were used.

Suture obliteration of axillary space under skin flaps with sutures to the chest wall, approximation of the pectoralis major and the latissimus dorsi muscle in the form of axillary padding has been suggested by some authors. The incidence of seroma formation had reduced but the length of drainage was not specified in these studies.

Furthermore suture approximation of the muscles may limit movement of the arm leading to

shoulder dysfunction. The association of seroma formation with large amounts of drainage before removal of the drain has already been established. In one study it was observed that when the amount of fluid drained before removal of the catheter was less than 250 ml in three days no seromas developed and they concluded that it is safe to remove drains if the total amount of fluid drained during the first postoperative days is low. Yii *et al.*^[10] reported that removal of drains after 48 hours did not result in seroma formation if the total amount of fluid drained before removal was less than 150 ml.

Conclusion

In the present study it was observed that high suction caused prolonged drainage, which can possibly be explained by the hypothesis that high negative suction may not allow, leaking lymphatics to close. Therefore no suction or high suction drainage both may contribute to the same result that is higher incidence of seroma formation and longer hospital stay.

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