

Original Research Article

Comparison of post-operative complications in modified radical mastectomy patients with full suction and compression bandage versus half suction and non-compression bandage

Mohammad Athar, Sanjay Kala*, Abhineet Gupta, Ashish Varshney

Department of Surgery, Ganesh Shankar Vidyarthi Memorial Medical College, Kanpur, Uttar Pradesh, India

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*Correspondence:

Dr. Sanjay Kala,

E-mail: dr_sanjay_kala@yahoo.com

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ABSTRACT

Background: Modified radical mastectomy still remains the most common surgical procedure employed in definitive management of breast cancer. Post mastectomy problems include skin flap necrosis, prolonged axillary drainage, seroma formation, wound gaping etc., among all seroma is commonest. Drainage usage and dressing applied after this procedure is debatable due to varying recommendations.

Methods: A prospective randomized control trial was conducted on 84 FNAC/TRUECUT biopsy proven cases of early and locally advanced breast cancer patients admitted in surgery department, GSVM Medical College, Kanpur over a period of two years. Aiming to compare full suction drainage and compression dressing (n=42) (group 1) with half suction drainage and non-compression dressing (n=34) (group 2), in terms of post-operative morbidities like skin flap necrosis, prolonged axillary drainage, seroma formation, wound gaping and length of hospital stay. Romsons 16 number Romovac drains were used for suction and 2 elastic 6" crape bandage were used for compression.

Results: During follow-up there was significant lower incidence of seroma formation in group 1 patients compared to group 2 patients (p<0.0019). Full compression dressing patients have increased incidence of superficial skin necrosis compared to non-compression dressing patients (p<0.022). Patients with half suction drainage and non-compression dressing has early drain removal than patients with full suction drainage and compression dressing (p<0.05), the length of hospital stay was less in group 2 compared to group 1.

Conclusions: There is markedly lesser incidence of post-operative seroma formation along with reduced morbidity in the form of patients discomfort and flap necrosis in post MRM patients with full suction drainage and compression dressing, but it requires a greater hospital stay and has slightly higher risk of superficial skin necrosis which can be easily managed with topical ointments, compared to patients with half suction drainage and non-compression dressing.

Keywords: Breast cancer, FNAC, MRM

INTRODUCTION

Modified radical mastectomy still remains the most common surgical procedure employed in definitive management of breast cancer.¹ MRM is indicated in all EBC and LABC patients who cannot be offered breast conservation (e.g., multicentric cancer, contraindication

for radiation pregnancy. Certain connective tissue disorders etc.) or those who are not willing to undergo breast conservation. Seroma formation is the most frequent postoperative complication seen after mastectomy and axillary surgery with an incidence of 3% to 85%.² Seroma after breast surgery is defined as a serous fluid collection that develops under the skin flaps

or in the axillary dead space following mastectomy and/or axillary dissection.² The origin of seroma remains unclear but several risk factors and predictors are age, breast size, comorbid conditions, presence and number of malignant nodes in the axilla, previous surgical biopsy, and use of heparin or tamoxifen. It has been hypothesized that seromas form as an exudate from an acute inflammatory reaction following surgical trauma to increase serous fluid collection in response to increased fibrinolytic activity in serum and lymph.²

Wound seromas frequently require multiple percutaneous aspirations, each with its own inherent risk of secondary axillary infection. Prolonged axillary drainage with or without clinical infection may impede wound healing and increase the incidence of subsequent lymphedema formation. Certainly, any intervention that could reduce the volume and duration of postoperative drainage would be beneficial. We hypothesized that the routine application of an external compression dressing after axillary lymph node dissection would decrease postoperative fluid formation. Thus, the purpose of the present study is to evaluate the use of an external compression dressing with full suction, compared with a standard dressing with half suction, in terms of its ability to reduce postoperative drainage, afford earlier drain removal, and reduce seroma formation.

METHODS

The prospective randomized control study was conducted in one surgical unit of a tertiary care center over a period of two years (October 2017 to October 2019), department of Surgery GSVM Medical College, Kanpur, with proper ethical approval. 84, FNAC (fine needle aspiration cytology)/ TRUCUT biopsy proven cases of early breast carcinoma and locally advanced breast cancer were randomized (using randomly ordered sealed chits, which were opened immediately at the time of surgery) into 42 cases of full vacuum suction (pressure=700 g/m²), and compression bandage group-A and 34 cases into half vacuum suction (pressure=350 g/m²) and no compression bandage as group-B (Figure 1). The two groups were comparable in respect of age, BMI, type of operation i.e. modified radical mastectomy (MRM), and extent of axillary dissection. Following complete routine and metastatic work up, all patients underwent a modification of radical mastectomy. Patients undergoing mastectomy without axillary dissection, undergoing breast conservation surgery and non-operable patients with bulky lymphnodes are excluded from the study. Surgery was performed by the same surgical team comprising of five surgeons (two senior and three resident surgeons) using a standardized technique with electro cautery. Axillary dissection was done up to level-II/III in all the cases. The boundaries of axillary dissection were defined by superior limit as the posterolateral border of the Pectoralis major muscle and axillary vein, medial limit being clavipectoral fascia or Hallstead's ligament, lateral limit as the anterior border of

lattismus dorsi and the inferior limit being the angular vein joining the thoracodorsal vein.

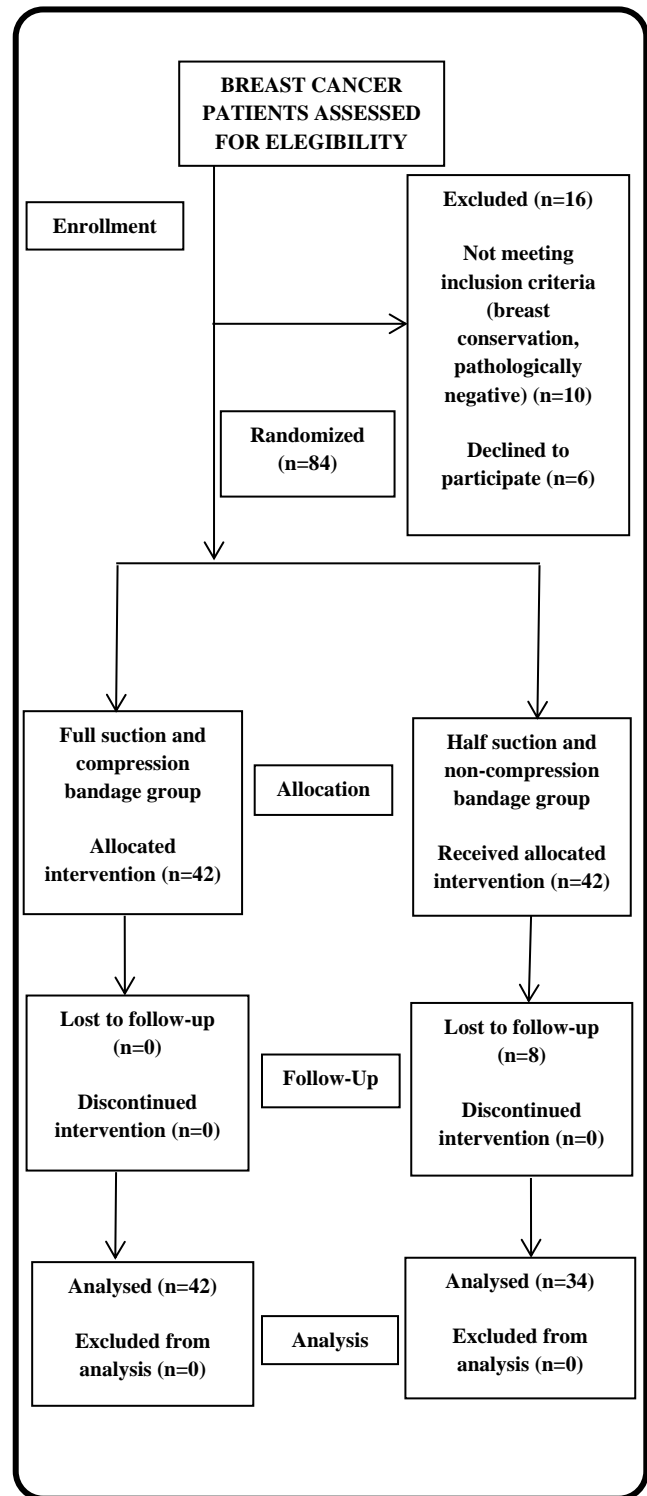


Figure 1: Total patient enrollment and excluded patient.

The long thoracic and thoracodorsal nerves were identified, dissected and preserved. Two silicone tube drains (16 Fr) (one axillary and pectoral) were inserted in all the patients. All resected specimens were examined

and the lymph nodes dissected, counted and assessed histo-pathologically for metastases. The compression dressing consisted of a circumferential chest wrap of two 6-inch crape bandages, held in place by circumferential Elastoplast bandage, and it was applied by the same resident. Patients in the standard dressing group (control) were fitted with a front-fastening cotton dressing only. No patient received intra-operative blood transfusion. Both the drains were connected to a single 800 ml suction bottle (Romovac-Romson). In group-A (n=42), drainage was performed using complete vacuum negative suction (700 g/m²) with compression bandage and in group-B (n=34) with half vacuum suction drainage (350 g/m²) and normal standard dressing was applied. The pressure was also measured by attaching a manometer to the exit opening of the drainage bottle.

The two groups were comparable with respect to age, body mass index, type of operation indicating the success of randomization. The drain was emptied every 24 hours to reset suction at the respective pressures and to measure the daily drain output. Following drainage and dressing the patients were encouraged to do active and passive shoulder exercises few on pod 1 and others on pod 5. The outcomes measured were morbidity in the form of seroma, axillary drainage volume, superficial skin necrosis, flap necrosis, wound gaping and the length of hospital stay. The total drain output was measured and recorded daily in both the groups, the drains were removed once the output was less than 30 ml in 24 hours and the patients were discharged on the next day. The mean total drain output was measured in each group and compared. The mean hospital stay in both the groups was calculated and compared. The associated morbidity in the form of seroma formation, flap necrosis and wound infection during the postoperative period was recorded and compared in both the groups. After discharge from the hospital all the patients were followed-up on outpatient basis for 4 weeks, to check for any seroma

formation by palpation and for sterile tapping if present any. Patients were also followed-up for other complications like skin necrosis, flap necrosis, wound gaping and other comorbidities if any, and managed accordingly (Figure 1).

Data processing and analysis

Statistical analysis, descriptive statistics were performed with SPSS version 23 and group characteristics were compared using chi square test. To summarize the data and provide descriptive reports, the one- and two-dimensional tables, mean, frequency percentage, and bar graphs were used. The significance level was considered as 0.05 in this study.

RESULTS

During follow-up there was significant lower incidence of seroma formation in group 1 patients compared to group 2 patients (p<0.0019).

Full compression dressing patients have increased incidence of superficial skin necrosis compared to non-compression dressing patients (p<0.022).

Patients with half suction drainage and non-compression dressing has early drain removal than patients with full suction drainage and compression dressing (p<0.05), the length of hospital stay was less in group 2 compared to group 1.

In Table 1, the baseline characters are compared among two groups (1 and 2) according to age, BMI, Stage, hypertension, diabetes, and patient underwent neoadjuvant chemotherapy and the p value comes out to be insignificant that means the two groups are comparable with respect to the following characteristics.

Table 1: Distributive table according to baseline characters.

Character		Full suction and compression	Half suction and no compression	P value
Age (yrs)	>50	24	21	0.6835
	<50	18	13	
BMI	>25	12	11	0.7212
	<25	30	23	
Stage	I and II	26	19	0.595
	III and IV	16	15	
Presence of hypertension	Yes	10	6	0.512
	No	32	28	
Presence of diabetes	Yes	3	1	0.4147
	No	39	33	
Neoadjuvant chemotherapy	Yes	22	16	0.6445
	No	20	18	

In Table 2, the two groups are compared with respect to seroma formation, superficial skin necrosis, flap necrosis, wound gaping and length of hospital stay, showing the significant difference of seroma formation among two groups i.e. lower incidence of seroma formation in group 1 patients compared to group 2. Though group 1 patients have high incidence of superficial skin necrosis compared to group 2 patients but it can be managed by simple ointment application. While there is no significant difference in the incidence of flap necrosis and wound gaping among two groups.

Table 2: Comparison of full suction and compression bandage versus half suction and non-compression bandage regarding the seroma formation, flap necrosis, wound gaping, superficial skin necrosis.

	Full suction and compression bandage (%)	Half suction and non-compression bandage (%)	P value
Seroma	10 (24)	20 (59)	0.001902
Superficial skin necrosis	22 (56)	9 (26)	0.022291
Flap necrosis	8 (19)	3 (9)	0.207803
Wound gaping	3 (7)	2 (6)	0.825564
Length of hospital stay	7.2 (SD=1.53)	5.4 (SD=1.02)	0.032412

DISCUSSION

Modified Radical Mastectomy is still a common procedure for carcinoma breast patients.¹ Routine use of drain and type of dressing after this procedure is debatable due to varying recommendations.

Seroma is most common complication after breast cancer surgery, it is a collection of serous fluid which develops in the space between the chest wall and skin flaps following mastectomy and axillary dissection. It occurs at rates ranging from 3% to 85% after breast or axillary surgery.^{2,3} Although it usually vanishes within a few weeks, some patients may require repeated aspirations even for a period of months. Prolonged accumulation of postmastectomy seroma and repeated aspirations predisposes to sepsis, wound-related complications (delayed healing, discomfort, flap necrosis, wound gaping) and may delay adjuvant therapy. There are many factors, which may increase or decrease seroma formation.^{4,5}

In present study few factors were studied and we found that there is increased incidence of seroma formation in overweight patients. There is direct association of seroma

formation with BMI of the patient, and no significant association is found with stage of the disease and neoadjuvant chemotherapy.⁶ van Bommel et al in his review concluded that there are however measures that can be taken significantly reduce seroma, through good use of drains and mechanical dead space closure as well as other means such as delaying physiotherapy. And suggested a research concerning decreasing seroma should be directed towards the reduction of seroma formation through the combined use of proven seroma reduction methods.⁶

A randomized control trail was done in Singapore General hospital to see the effect of a pressure garment on post-surgical drainage and seroma formation in breast cancer patients, concluded that the use of a pressure garment does not reduce the post-operative drainage, however, the complication rate appears to be higher when the pressure garment is not being used.⁷ Use of compression dressing may have benefits in terms of complication in post MRM patients.⁸

He et al concluded that insertion of a drain in the axilla following ALND in breast cancer surgery effectively decreased seroma formation, volume of aspiration as well as the frequency of seroma aspiration without increasing the incidence of wound infection, but extending their stay in hospital.⁹

With above facts It was hypothesized that the use of suction drain with compression dressing is the effective method to reduce the incidence of seroma aspiration by mechanism of reduction of the dead space between the chest wall and skin flap by suction and mechanical compression and the time of drain output was taken to be <30 ml per day.¹⁰

It is stated that Insertion of a drain in the axilla following ALND in breast cancer surgery effectively decreased seroma formation, volume of aspiration as well as the frequency of seroma aspiration without increasing the incidence of wound infection, but extending their stay in hospital.¹¹ A prospective randomized control trial compared the duration of hospital stay, seroma formation between full and half vacuum suction after MRM and found no significant difference in the incidence of seroma formation in two groups but drain were removed earlier and there was less hospital stay in patients with half vacuum suction drain.¹² Bonnema et al stated that There are no differences in axillary fluid production or wound complication rates after axillary dissection and subsequent drainage between high and low vacuum drainage systems.¹³

In present study it was observed, when full suction drainage was combined with compression dressing the incidence of seroma formation was less as compared to half suction drainage and non-compression dressing, with greater hospital stay of a day or two and with slight higher risk of superficial skin necrosis. Which can be

managed by topical ointment application. It is also stated that early discharge after mastectomy before drain removal is currently an acceptable practice.^{14,15} Early removal of post mastectomy drains is not recommended.¹⁶

CONCLUSION

There is markedly lesser incidence of post-operative seroma formation along with reduced morbidity in the form of patients discomfort and flap necrosis in post MRM patients with full suction drainage and compression dressing, but it requires a greater hospital stay and has slightly higher risk of superficial skin necrosis which can be easily managed with topical ointments, compared to patients with half suction drainage and non-compression dressing.

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