

Original Research Article

## Half versus Full Vacuum Suction Drainage after Modified Radical Mastectomy for Breast Cancer -A Prospective Randomized Control Study

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**Abstract:** Suction drains are routinely used after modified radical mastectomy (MRM) and is an important factor contributing to increased hospital stay. Negative suction is expected to drain the collection and reduce the dead space. 50 FNAC proven cases of locally advanced breast cancer were randomized in two groups. Group A with full vacuum suction (pressure = 100mmHg) and Group B with half vacuum suction drainage (pressure = 50 mmHg). The outcomes measured were postoperative seroma formation and length of hospital stay. Mean of 18.68 days of drainage was noted in Group A and 14.24 days in Group B. Seroma formation was the most common complication in Group A (6/25) while none of patients in Group B developed seroma. Other complications noted were wound infection and flap necrosis. The study concluded that half vacuum suction drain is better than full vacuum suction by decreasing the amount of drain output, less duration of drainage, shortening the duration of hospital stay and preventing the incidence of seroma in post MRM period. Incidence of wound infection and flap necrosis among the full vacuum and half vacuum groups are statistically insignificant. Overall half vacuum suction drainage should be preferred over full vacuum suction drainage in Modified Radical Mastectomy.

**Keywords:** Breast Carcinoma, Modified Radical Mastectomy, Half and full vacuum suction, seroma formation, early removal of drain

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### INTRODUCTION

In India, the age standardized incidence rate of breast cancer varies from 9 to 32 per 100,000 women [1]. Breast cancer is a disease of the developed world and it is more common in West nulliparous women or in women who refuse breast feeding [2].

Use of drains has been a common surgical practice to obliterate the dead space created during surgery and frequently used in post MRM. Drains are used both prophylactically and therapeutically. Commonly used as prophylaxis in post-surgery to prevent accumulation of fluid. Active drains require special maintenance and offer certain advantages. Active drains utilizing negative pressure therapy are safe and feasible in low resource settings. Studies comparing the intensity of negative drain suction as well as early or late removal of drains have shown mixed results.

High vacuum drains had a higher incidence of vacuum loss but a lower incidence of leakage around the drain. No suction or high suction drainage both may contribute to higher incidence of seroma formation and longer hospital stay. In high suction drain lymphatic channels remain open and lead to prolong drainage and higher incidence of seroma formation. To reduce these complication half vacuum suction drainage is proposed and comparison of half and full vacuum suction drainage was done in this study.

### METHODS AND METARIALS

This prospective randomized control study entitled "Half Versus Full Vacuum Suction Drainage after Modified Radical Mastectomy for Breast Cancer - A Prospective Randomized Control" was conducted in the department of general surgery of S P Medical College and A.G. Hospital, Bikaner, for duration of Nov 2015 to Feb 2017. Fifty FNAC proven cases of

locally invasive breast cancer (clinically staged according to the AJCC 7<sup>th</sup> edition) following complete routine and metabolic work up underwent standard MRM as treatment for ca breast. These fifty cases were divided into two groups randomly by block randomization based on the type of suction used postoperatively. Group A had full suction and group B used half vacuum suction. [Group A: 100 mm Hg pressure; Group B: 50 mm Hg pressure]. the operative procedure (using standardized technique with electro-cautery) was performed by the same surgical team in both groups. Axillary dissection was done up to level-III in all these cases. Two silicon tube drains (14 Fr) were inserted in all the patients post operatively. Both the drains were connected to a single 600 ml suction bottle (Romovac –Romson). In-group A (n = 25), drainage was performed using complete vacuum negative suction (100mm of Hg) and in-group B (n = 25) on first post-operative day using full vacuum negative suction, thereafter with half vacuum suction drainage (50mm of Hg).

The pressure was measured by attaching a manometer to the exit opening of the drainage bottle. External compression dressing was provided over the axilla for first 48 hrs. The patients were encouraged for both active and passive shoulder exercises. The outcome was measured by morbidity and the length of hospital stay. The data were collected by pre-structured pre-tested Performa. The total drain output was measured and recorded daily in both the groups; mean drain output of three days were considered for calculation. Drains were removed when the output was less than 10 ml in 24 hrs. 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 were recorded and compared in both the groups. Data was analyzed by Microsoft excel and statistical software SPSS. The frequency distribution, figures, proportions, measures of central tendency and appropriate statistical test were done. p-value <0.05 will be considered as significant.

## RESULT AND DISCUSSION

Group A cases had an average of 18.68 days (S.D =3.711) of drain output in comparison to Group B which had only 14.24 days (S.D =3.44) of drainage on an average (p<0.0001). In our study, the patients were discharged on the same day of drain removal. In Group

A maximum days of drainage was 27 days and minimum of 10 days where as in Group B maximum days of drainage was 17 days and minimum days of drainage was 7days. These results were at par with the study of Junaid Mansoor *et al*<sup>3</sup> with mean hospital stay in low vacuum suction group was  $4.96 \pm 0.898$  days which was 32.9% shorter than  $7.39 \pm 1.397$  days for high pressure suction group (p< 0.005). The difference in the average days of hospital stay among the studies can be attributed to the criteria of drain removal, which was 30 ml as compared to 10 ml in our study. The Junaid Mansoor *et al.*; [3] study concluded use of low vacuum versus high vacuum drains after modified radical mastectomy reduces the hospital stay significantly. The study of Ahmed M. Abdel-Rahman [4] also had similar results with mean hospital stay 10.1days in full suction group and 6.3 days in half vacuum suction group (p< 0.001).

In present study seroma formation was the most common complication in post MRM patient with an overall rate of 12% among 50 patients. 6 cases of full vacuum drainage developed seroma in comparison with no cases of seroma formation among half vacuum group. On statistical analysis, this result was significant with a p value of 0.022. VS Chintamani *et al.*; in 2005 [5] study over 85 cases showed insignificant difference among the groups of full and half vacuum suction with respective to incidence of seroma formation. Bonnema J [6] study of 73 cases of MRM also had similar results to that of VS Chintamani *et al.*; [5] study with insignificant difference among the groups with respect to seroma formation. The result of our study was different from the above studies. This difference in the results of above studies and present study can be attributed to smaller number of study sample and thus demanding for a larger and multiple studies to confirm the results.

In our study 2 cases of wound infection and 2 cases of skin necrosis were noted in Group A whereas 1 case of wound infection and 1 case of skin necrosis was noted in Group B. The Bonnema J [6] study of total 73 cases of MRM, wound complications were noted in 6 cases of high vacuum group and 5 cases in low vacuum group. Wound infection was noted in 2 cases of full vacuum and 3 cases of half vacuum group. These results were statistically insignificant. Our study results were also at par with the above study by showing insignificant p value for skin necrosis and infection with a p value >0.05.

**Table 1: Average number of days for drain removal in Group A and Group B**

	Group A (Full Vacuum) n=25	Group B (Half Vacuum) n=25
Average number of days (Hospital stay)	18.68	14.24
Standard deviation	3.771	3.44
Variance	14.226	11.84

t test =5.13 , p value < 0.0001

**Table 2: Distribution of cases according to the complications in Group A and Group B**

Complications N=50 (100%)	Group A (Full Vacuum) n=25	Group B (Half Vacuum) n=25
Wound Infection	02 (08%)	01(4%)
Skin Necrosis	02 (08%)	01 (4%)
Seroma	06 (24%)	00
Seroma Aspiration	06 (24%)	00

### CONCLUSION

The study concluded that half vacuum suction drain is better than full vacuum suction by decreasing the amount of drain output (after 6 days of post-operative period), less duration of drainage, shortening the duration of hospital stay and preventing the incidence of seroma in post MRM period. Incidence of wound infection and flap necrosis among the full vacuum and half vacuum groups are statistically insignificant. Overall half vacuum suction drainage should be preferred over full vacuum suction drainage in Modified Radical Mastectomy.

### REFERENCES

1. Terrell GS, Singer JA. Axillary versus combined axillary and pectoral drainage after modified radical mastectomy. *Surgery, gynecology & obstetrics*. 1992 Nov; 175(5):437-40.
2. Morris AM. A controlled trial of closed wound suction drainage in radical mastectomy. *British Journal of Surgery*. 1973 May 1; 60(5):357-9.
3. Mansoor J, Ahmed M, Junaid Z, Umair M, Meshwani AH. Impact of low versus high vacuum suction drainage on duration of hospital stay after modified radical mastectomy. *Pakistan Armed Forces Medical Journal*. 2015; 65(5):604-9.
4. Available at:  
<http://www.aamj.eg.net/journals/pdf/2373.pdf>
5. Singhal V, Singh JP, Bansal A, Saxena S. Half versus full vacuum suction drainage after modified radical mastectomy for breast cancer-a prospective randomized clinical trial [ISRCTN24484328]. *BMC cancer*. 2005 Jan 27; 5(1):11.
6. Bonnema J<sup>1</sup>, van Geel AN, Ligtenstein DA, Schmitz PI, Wiggers T. A prospective randomized trial of high versus low vacuum drainage after axillary dissection for breast cancer. *Am J Surg*. 1997 Feb; 173(2):76-9.