

USEFULLNESS OF PARTIAL VERSUS FULL VACUUM SUCTION DRAINAGE AFTER MODIFIED RADICAL MASTECTOMY FOR BREAST CANCER

Breast Surgery

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ABSTRACT

Background- Seroma represent the most common complication of modified radical mastectomy [1], done for breast cancer surgery, especially when axillary dissection is performed. Suction drainage in the management of mastectomy patients was used for the first time in 1947 [2] and has been found in various studies that it is superior to other methods of fluid evacuation to minimize the dead space. **Aims-** To compare usefulness of partially closed vacuum suction drainage versus fully closed vacuum suction drainage after Modified Radical Mastectomy in breast cancer patients in terms of Length of hospital stay, Post operation morbidity and Mean Drain output. **Settings and Design-** Patients diagnosed with Breast cancer attending surgical outpatient department of, S.S.G. Hospital, BARODA, during the period of one year of study from 17/10/2019 to 18/11/2020., were subjected to Auchincloss modified radical mastectomy. **Methods and Material-** Two groups were allotted and Pressure measured by measuring length of vacuum suction bottle in centimeters. **Statistical Analysis used-** p-value, the student t test **Results and Conclusions-** 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.

KEYWORDS

- Modified radical mastectomy, vacuum suction drainage, seroma, partial versus full MeSH terms- Mastectomy, Modified Radical, Drainage, vacuum

INTRODUCTION

Seroma represents the most common complication of modified radical mastectomy^[1], done for breast cancer surgery, especially when axillary dissection is performed.

There have been various methods for preventing seroma, such as prolonged suction drainage, shoulder immobilisation, suturing of dead place, peri-operative use of tranexamic acid, octreotide usage, dressing compression, tissue sealers, etc.

Suction drainage in the management of mastectomy patients were used for the first time in 1947^[2] 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^[3,4]. This reduces the incidence of post-operative seromas, hematoma formation and flap necrosis, which are, recognized complications of modified radical mastectomy^[3,4].

When no postoperative suction drains were used, the incidence of seromas was found to be unacceptably high in various studies^[5]. Prolonged drainage on the other hand, may increase the hospital stay resulting in to wasteful utilization of the hospital resources and increase the risk of infection by allowing retrograde migration of bacteria^[5].

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^[5-7].

Aims Of Study

To compare usefulness of partially closed vacuum suction drainage versus fully closed vacuum suction drainage after Modified Radical Mastectomy in breast cancer patients in terms of: -

1. Length of hospital stay.
2. Post operation morbidity in terms of: -
 - a. wound infection
 - b. seroma formation
 - c. wound dehiscence
3. Mean Drain output

METHODS

Study Setting

- This study was conducted at Dept. Of Surgery, SSG Hospital & Medical college Baroda. Duration: 17/10/2019 to 18/10/2020.

Type Of Study

Prospective Randomized Controlled Study

Sample Size

My sample size is 120 cases.

Inclusion Criteria

1. FNAC proven cases of unilateral early breast carcinoma (stage I, stage IIA, stage IIB, and stage IIIA breast cancers.)
2. Patients undergoing Auchincloss Modified Radical Mastectomy
3. including who have received neoadjuvant chemotherapy and down staged.
4. Age group: - 40 – 60 years
5. Patients who are willing to participate in the study.

Exclusion Criteria

1. Metastatic breast carcinoma (metastasis beyond regional lymph node)
2. Patients undergoing breast conservative surgery
3. History to hypersensitivity to general anesthetic agents
4. Uncontrolled Diabetes, hypertension and respiratory problems
5. Patients not willing to give informed consent

METHODS

We studied all the patients diagnosed with Breast cancer who came in Surgical O.P.D. of, S.S.G. Hospital, BARODA, during the period of one year of study from 17/10/2019 to 18/11/2020.

- All patient were subjected to Auchincloss modified radical mastectomy
- All patients were operated under General Anesthesia
- After taking Informed and written consent, patients were allotted sealed envelopes using envelope technique, and opened immediately before closure of the wound in two groups
- 'GROUP-A' - full vacuum suction group
- 'GROUP-B'. - half vacuum suction group
- Two silicon tube drain (14 Fr) were inserted in patient intra-operatively, one under pectoral flap and other in axilla
- Both suction drains were connected to single 800 ml suction bottle (Romovac-Romson)
- Pressure measured by measuring length of vacuum suction bottle in centimeters.

1. The size of Non compressed suction bottle is nine centimeters (9cm)
2. The size of fully compressed suction bottle i.e., Full vacuum suction is three centimeters (3cm)
3. The size of half compressed suction bottle i.e., Half vacuum suction is six centimeters (6 cm)

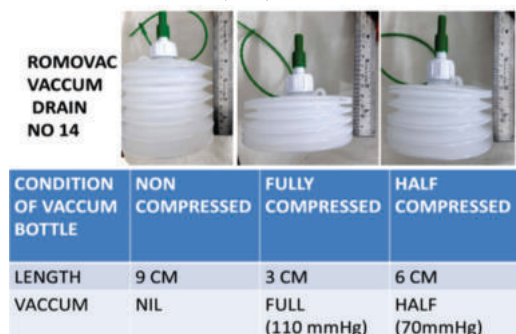


Figure 1: relation of length of Vacuum suction bottle and vacuum(negative pressure)

Size = (((length of suction bottle when not compressed) - (length of fully compressed suction bottle)/2) + (length of fully compressed suction))

$$= (((9-3)/2) + 3) = 6\text{cm}$$

- External compression dressing is provided over axilla for first 48hrs
 - Patients are encouraged both active and passive shoulder exercises
 - Dressing is changed every 3 days, the condition of suture line is noted and if any signs of local infection or inflammation present or absent like redness, purulent discharge, swelling, raised local temperature, etc. is noted.
 - If any signs of local infection or inflammation was noted appropriate action is to be taken as per standard protocol i.e.,
1. If signs of inflammation or infection are present then higher antibiotics, frequent dressing is done. If purulent discharge is present suture were open and pus is drained and sent for culture sensitivity and appropriate antibiotics according to sensitivity was given.
 2. If wound dehiscence is present, sutures are removed, wound discharge culture sensitivity is sent and frequent dressing is done.
 3. If seroma formation is present, ultrasonography guided needle aspiration is done, compression dressing is given. If recurrence occurs incision is given and seroma fluid is drained.
- Negative suction drain was removed when drain output is <20 cc/24hr
 - Date of removal of drain/Discharge of Patient is noted.
 - Follow-up was done Daily for first 10 postoperative days then weekly for next 2 weeks and then monthly for 6 months after discharge.

ETHICS

The procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation.

Statistics

Collected data will be tabulated & analyzed in Microsoft excel worksheet. Relationship between length of hospital stay, post-operative morbidity, mean drain output were analyzed. Statistical significance was calculated using p-value, the student t test, Chi-square test as appropriate.

Total 120 patients were included in the study and their details were recorded.

Observation and analysis of all the parameters of the studies are as follows:

1. Patient characteristics: -

Table 1: patient characteristics

	Full vacuum suction group n = 60	partial suction vacuum group n = 60
Mean Age (years)	49.5 (SD = 3.30)	48.2 (SD = 2.78)
Mean Weight (kg)	54.5 (SD = 4.15)	57.15 (SD = 7.50)

* SD=Standard Deviation, kg= kilogram

2. Length of hospital stay: -

Table 2- Duration of hospital stay.

	Full vacuum suction group	Partial vacuum suction group
Mean Duration of Hospital stay (days)	9.45 (SD = 0.83)	6.1 (SD = 1.25)

* The t-value is t = 9.9878 and the p-value is less than 0.0001

This finding is statistically significant.

† SD=Standard Deviation

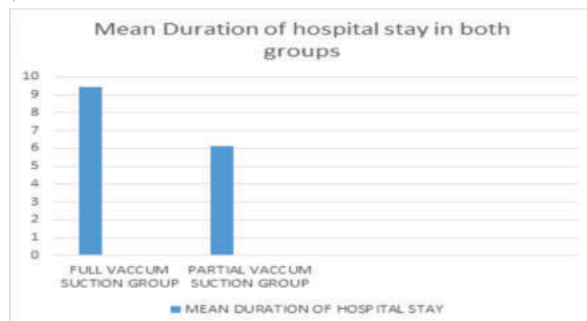


Figure 2: Mean Duration of hospital stay in both groups

3. Post-operative morbidity: -

Table 3: - post-operative morbidity in both groups

	Full vacuum suction group n=60	Partial vacuum suction group n=60
Post-operative morbidity		
Wound infection	2	2
Seroma formation	6	4
Wound dehiscence	2	2

* The chi-square statistic is 0.7843. The p-value is .375825. Not significant at $p < .05$. There is no significant difference in post-op morbidity in both groups

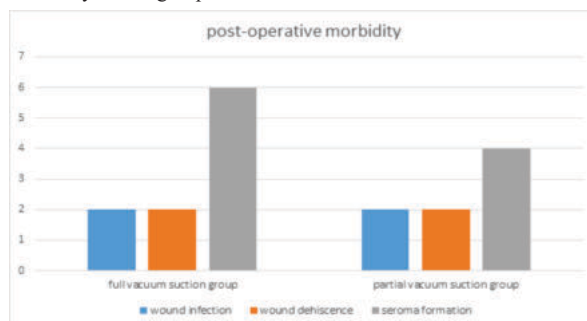


Figure 3: Post-operative morbidity in both groups

4. Mean drain output: -

Table 4: mean drain output in both group

	Full vacuum suction group n=60	Partial vacuum suction group n=60
Mean Drain Output (milliliters)	1061 (SD = 145.78)	632 (SD = 149.97)

* The t-value is 9.1732 and the p-value is less than 0.0001. This finding was statistically significant.

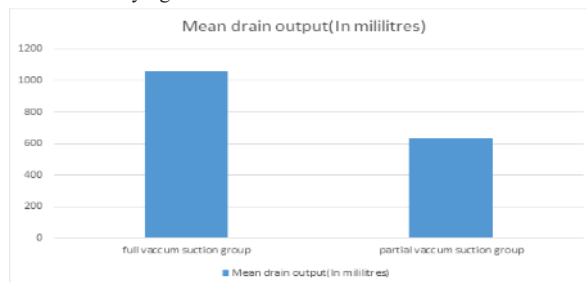


Figure 4: mean drain output in both group

DISCUSSION

- After axillary lymphadenectomy, the management of postoperative seroma (which is the most commonly observed early complication after breast and axillary surgery) is at crossroads of modern postoperative care.
- In our study we found that high suction caused prolonged drainage, which can possibly be explained by the assumption 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.
- To balance between not having suction at all and having a full negative suction, half negative suction drainage was used in the present study to achieve a shorter hospital stay without any increase in the rate of postoperative seroma formation. This was found to effectively reduce the hospital stay and also did not increase the postoperative morbidity as compared to high (full) negative suction group.
- These findings agree with the results of van Heurn^[8], Brink and others who reported that the high negative suction pressure does not allow the lymphatic channels to close leading to continuous drainage and a higher incidence of seroma formation^[50-51].
- Postoperative complications including wound infection, wound dehiscence and seroma formation were similar in the 2 groups but assumption of equivalence of postoperative morbidity here based on these data is not possible due to the small population size of the study.

Table 5. Comparison of Mean Duration of hospital stay in different Study Group.

	VS Chintamani Et Al. [53] Study Group (N=85)	Ahmed M. Abdel-Rahman [52] Study Group (n=47)	Present Study Group (n=60)
Full Suction Vacuum Group	10.8 (S.D = 1.603)	10.1 (S.D = 1.555)	9.45 days (S.D =0.83)
Partial Suction Vacuum Group	6 (S.D = 1.414)	6.34 (S.D = 1.301)	6.1 days (S.D =1.25)

- In Present Study we found that use of low vacuum versus high vacuum drains after modified radical mastectomy reduces the hospital stay significantly. The study of Ahmed M. Abdel-Rahman^[52] and VS Chintamani *Et Al.*^[53] also had similar results.

Table 6: Mean drain output in different Study Groups

	VS Chintamani Et Al. [10] Study Group (N=85)	Ahmed M. Abdel-Rahman [9] Study Group (n=47)	Present Study Group (n=40)
Full Suction Vacuum Group	525 (S.D = 66.282)	921 (S.D = 85.323)	9.45 days (S.D =0.83)
Partial Suction Vacuum Group	325 (S.D = 39.612)	512 (S.D = 71.601)	6.1 days (S.D =1.25)

In our Study the Mean Drain output in Full vacuum suction group is statistically significant in comparison to Partial vacuum suction. The study of Ahmed M. Abdel-Rahman^[52] and VS Chintamani *Et Al.*^[53] also had similar results.

Table 7. Comparison of post-operative morbidity in both groups in Different Study Groups

		VS Chintamani Et Al. [10] Study Group (N=85)	Ahmed M. Abdel-Rahman [9] Study Group (n=47)	Bonnema J [11] study Group (n=73)	Present Study Group (n=60)
Full Suction Vacuum Group	Wound infection	4	3	2	2
	Seroma formation	2	5	NA	6
	Wound dehiscence	NA	1	0	2

Partial Suction Vacuum Group	Wound infection	3	2	3	2
	Seroma formation	1	2	NA	4
	Wound dehiscence	NA	1	0	2

In present study seroma formation was the most common complication in post MRM. On statistical analysis, this result was insignificant. VS Chintamani *et al.*; in 2005^[10] study over 85 cases showed insignificant difference among the groups of full and half vacuum suction with respect to incidence of seroma formation. BonnemaJ^[11] study of 73 cases of MRM also had similar results to that of VS Chintamani *et al.*^[10], study with insignificant difference among the groups with respect to seroma formation. The result of our study was same as the above studies.

- Our study results were also at par with the above study by showing insignificant p value for wound dehiscence and infection.

CONCLUSIONS

This study we found 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 wound dehiscence among the full vacuum and half vacuum groups are statistically insignificant. Hence, Overall half vacuum suction drainage should be preferred over full vacuum suction drainage in Modified Radical Mastectomy.

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