Original Research Article

Analysis of the efficacy of Active and passive drainage after modified radical mastectomy

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Abstract

Background: Amongst various factors that influence the amount of post operative drainage, the negative suction pressure applied to the drain has been reported to be of great significance. **Aim:** To analyze the amount and extent of drainage between an active and passive drainage in patients undergoing Modified Radical Mastectomy. **Methods:** Patients were randomised using randomly ordered sealed envelopes, which were opened immediately before the closure of the wound, to decide on whether suction or dependent drain was to be given. Drains were removed when output was less than 30 ml per day. Patients were followed up from the day of surgery till the day of drain removal. Statistical analysis was performed with SPSS.**Results:** There is significant increase in the drain per day in post MRM patients with active suction drain. But, there is no relation between the type of drain and either total drain output or the total number of days of drain. The study also revealed that there is no significant difference in the number of days of hospital stay in both groups of patients.**Conclusion:** Suction drains do not have any significant advantage over dependent drains after Modified Radical Mastectomy in breast cancer patients.

Keywords: Drain output, Modified radical mastectomy, Passive drains, Suction drains.

Introduction

Around the world, the most common malignant growth in females includes breast cancer, representing 25% of all cases[1]. In the individuals who have been determined to have disease, various therapies might be utilized, including surgery, radiation treatment, chemotherapy, hormonal treatment and focused treatment. Surgical intervention may require wide excision to palliative mastectomy. Modified Radical Mastectomy includes expulsion of the whole breast including the breast tissue, skin, areola, nipple and the vast majority of the axillary lymph nodes. Results for breast malignant growth shift contingent upon the malignancy type, degree of sickness, and individual's age. Resolution rates in the highly developed world are high, with somewhere in the range of 80% and 90% of those in England and the United States alive for in any event 5 years[2]. In less developed / developing nations resolution rates are poorer[3]. Surgical drains eliminate blood, serum, lymph, and different liquids that collect in the injury bed after a surgery. Whenever permitted to accumulate, these fluids put pressure on the site just as adjoining organs, vessels, and nerves. The diminished perfusion defers wound healing process and the increased compression causes torment. What's more, fluid assortment fills in as a favorable place for microbes. Fluids can be eliminated from an wound utilizing either a passive or active surgical drains. Passive surgical drains depend on gravity to

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clear fluid, while active surgical drains are joined to a vacuum gadget. A specialist picks a drain that the two fits the usable site and can deal with the sort and measure of seepage anticipated.The first suction drain in the treatment of mastectomy patients was utilized without precedent in 1947[4]. The system proposed is that the suction causes skin folds to cling to the chest wall and axilla fixing off all the spilling lymphatics. This lessens the rate of post-operative seromas, hematoma and flap putrefaction, which are perceived complications of Modified Radical Mastectomy[5,6]. Drainage for a longer duration then again, may expand the duration of admission in hospital and increment the danger of contamination by permitting retrograde relocation of bacteria[7]. If continued for longer periods it has been seen that drains itself may add to expanded seepage and the danger of disease not withstanding the expanded emergency hospital stay bringing about inefficient usage of the hospital assets. The quantity of postoperative drainage is impacted by different components like the clinical profile of the patient including the weight, degree of axillary lymph nodes dismemberment, number of lymph nodes dissection, utilization of elctrocautery, comorbid conditions and furthermore the negative tension on the suctions drain.[7-13] Against this foundation a clinical examination was required to analyze the amount and extent of drainage between an active and passive drainage in patients undergoing Modified Radical Mastectomy.

Materials and methods

Study design

This was a single-center, prospective, randomized, non-blinded and comparative study. Patients with diabetic foot ulcer attending the Out Patient Department, of Vardhman Institute of Medical Sciences, Pawapuri. The study was conducted over a period of 19 months from February 2019 to August 2020. The study was approved by the Institutional Research Committee.An informed and written consent was obtained from all the participating subjects before the commencem ent of the study.

Inclusion criteria

- All female patients who have histopathologically proven carcinoma breast and have undergone Modified RadicalMastectomy.

Exclusion criteria

- Patients who have undergone breast conservation surgery.
- Patients who underwent spontaneous expulsion of drains and those who were discharged with their drains.

Randomization

- The estimated sample size for the study was 60 patients. The patients who fulfilled the eligibility criteria were randomized into two treatment group.
- Group A- Received dressing with topical super-oxidized solution.
- Group B- Received dressing with povidone iodine.

Both axillary and chest drains were kept and connected to a single Romovac suction drain. Patients were randomized using randomly ordered sealed envelopes, which were opened immediately before the closure of the wound, to decide on whether suction or dependent drain was to be given. Tight breast bandages were applied within two hours of surgery. Exercises were started within 24 hours of surgery and continued daily. Daily drain output was monitored by the investigator. Drains were removed when output was less than 30 ml per day. Patients were followed up from the day of surgery till day of drain removal. Using a printed proforma, patient details, surgical details, details of the treatment and daily drain output was recorded. Statistical analysis was performed with SPSS version10.

Results

There was statistically significant decrease in the mean drain per day in the group with dependent drain compared to the group with suction drain. (p = 0.021). (Table1)

Table 1: Comparison of mean drain output per day (ml/day) between dependent drain and suction drain group

	Mean drain per day (ml)
Dependent drain	74.08
Suction drain	86.41

There was no statistically significant difference in the total drain output between the two groups (p = 0.765) (Table 2)

Table 2: Comparison of mean total drain output between dependent drain and suction drain group

Mean total drain (ml)

Dependent drain	658.44
Suction drain	683.40

There was no statistically significant difference in the number of days of drain between the two groups (p=0.063) (Table 3).

Table 3: Comparison of average number of days of drain between dependent drain and suction drain group

	Minimum	Maximum	Mean
Dependent Drain	4	15	8.48
Suction Drain	2	14	7.28

The major baseline characters that were studied includes age and Body Mass Index of the patient, presence of co morbidities like diabetes and hypertension in the study group, history of neoadjuvant chemotherapy in the patient, stage of the disease at diagnosis and the total number of lymph nodes harvested during surgery. These parameters were selected by the investigator based on review of literature of previous studies which have already found association between the afore mentioned characteristics and drain output. On statistical analysis it was found that there is no significant difference in base line characteristics between the two groups and that they are fairly comparable. (Table 4).

Table 4: Comparison of baseline characters

Character	Dependent drain	Suction drain	P value
Age	52.64	55.76	0.661
Body mass index	23.44	23.13	0.683
Presence of diabetes	16%	20%	0.603
Presence of hypertension	26%	28%	0.822
Neoadjuvant chemotherapy	20%	14%	0.603
Stage of disease			0.269
No of lymph nodes	11.32	10.92	0.397

Discussion

In this examination, we have gathered information from 50 patients with active drain and 50 patients with dependent drain and compared both the data to evaluate the upside of active drainage over passive drainage. In this examination it was observed that the mean of total drain output in patients with passive drainage was 658.44 ml and that of patients with active drainage was 683.40 ml. Statistically this difference in total drain output amongst the two groups was not significant. (p = 0.765). Nadkarni et al (2007) in their study found, no influence on the incidence of seroma formation either with suction drain (84.6%) or corrugated drains (86.1%) (p=0.822). they concluded that, the different drainage techniques and postoperative seroma formation are independent [14].

This study also observed the amount of drain in dependent and non dependent drainage. The mean of this was found to be 74.08 ml and 86.41 ml per day respectively. There is both clinically and statistically significant difference amongst the two groups studied. (p = 0.021). Chintamani et al (2005) in their study comparing Half (pressure = 350 g/m^2) versus full (pressure = 700 g/m^2) vacuum suction drainage, reported a statistically significant mean drained volume between the two groups. The mean volume drained using full suction to be 525 ml and that using half suction was 325 ml [15]. As far as the duration of hospital stay concerned, the mean number of days required for hospital stay was higher in dependent drainage group (8.48) compared to suction group (7.28). However this difference was not statistically significant. (p=0.063) The study reports of Somers et al shows, a significantly lesser mean number of aspirations and Mean volume of aspiration in the drained group compared to non-drained group. They also reported the advantage of closed suction drainage advantageous in decreasing the incidence and degree of seroma formation and subsequent hospital stay[16].A Meta analysis report of Katsumasa Kuroi et al 2006, concludes, the risk factor for seroma formation includes, heavy weight, extended radical mastectomy, larger drainage volume in initial 3 days. While, duration of drainage, number of drains, lymph node status does not influence seroma formation

significantly. However, sentinel lymph node biopsy reduces seroma formation[17]. Low vacuum drains are used for shorter duration in compare to high vacuum drains. But seroma formation is not related to low or high vaccum. (Van Heurn and brink, 1995)[18].

Conclusion

The amount of per day drain was significantly higher in active drainage group. However, there was no relationship between active and passive drain either for drain output or total number of days. Therefore, the number of days of required for hospital stay was not significant. Thus, it can be concluded that, both the drainage mechanisms are equally acceptable. The cost effectiveness of dependent drainage must not be overlooked.

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