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Research Article

ROLE OF QUILTING TECHNIQUE IN REDUCING SEROMA FORMATION AFTER MODIFIED RADICAL MASTECTOMY

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ABSTRACT

Objectives: The objective of the study was to evaluate the efficacy of mastectomy flap quilting sutures in reducing post-modified radical mastectomy seroma formation.

Methods: The prospective study was conducted by the Department of Surgery Sardar Patel Medical College and A.G. Hospitals, Bikaner, from December 2021 to December 2022. Fifty control and 50 cases of carcinoma breast in the general surgery department were recruited in the study.

Results: The mean age of the patients in the cases group was 51.00±12.93 years and control group was 54.16±13.39 years. Mean drain volume of the patients in the cases group was 489.00±10.54 mL and control group was 586.00±22.67 mL and the drain duration of surgery of the patients in the cases group was 8.30±0.44 days and the control group was 12.60±0.80 days. Two (4.00%) patients in cases group and eight (16.00%) patients in control group seroma formation was present ($p<0.05$).

Conclusion: Flap fixation is a surgical technique that obliterates the dead space in patients undergoing modified radical mastectomy. It appears to reduce the total volume of fluid drained, the development of seroma, and the need for seroma aspirations.

Keywords: Seroma, Mastectomy, Quilting technique.

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INTRODUCTION

Breast cancer is one of the most common malignancies in women and a leading cause of cancer death among women. The overall incidence of breast cancer has been rising because of an increase in the average life span, lifestyle changes that increase the risk for breast cancer, and improved survival from other diseases [1]. It accounts for 33% of all female cancers and is responsible for 20% of the cancer-related deaths in women [2]. Modern therapy has evolved to include both surgical resection for local disease and medical therapy for systemic disease. Surgery still has a central role to play but there has been a gradual shift toward more conservative techniques [3]. MRM is a safe operation with low morbidity and mortality.

Surgeons have faced several problems such as necrosis of skin flaps, breakdown of the wound, hematoma, seroma, and infection [4] and should be aware of the morbidity unique to mastectomy and axillary node dissection. Among them, seroma, a subcutaneous collection of serous fluid within a surgical cavity, that is, clinically evident [5], and is the most frequent post-operative complication after breast cancer surgery [6], developing in approximately 30% of cases. The pathogenesis of seroma has not been fully elucidated. Seroma is formed by acute inflammatory exudates in response to surgical trauma and the acute phase of wound healing.

Excessive accumulation will stretch the skin and cause it to sag, resulting in significant morbidity and delay in the initiation of adjuvant therapy, patient discomfort, and prolongation of hospital stay [6]. To prevent seroma formation, it is important to estimate individual risk of seroma formation, that is, the identification of predictive variables will be helpful in designing future trials aimed at reducing the incidence of this common complication of mastectomy [7].

Prevention of post-mastectomy seroma has been studied for decades and still, no satisfactory measure is available. Various techniques of prevention that was studied include pre-operative administration of tranexamic acid, intraoperative dead space obliteration and firm dressing with an axillary pad, post-operative prolonged drainage of more than 10 days, and shoulder immobilization [8]. Dead space obliteration by flap fixation to the chest wall after mastectomy has shown promise in reducing post-mastectomy seroma.

Aim

The aim of the study was to evaluate the efficacy of mastectomy flap quilting sutures in reducing post-modified radical mastectomy seroma formation.

METHODS

This prospective hospital-based study was conducted by the Department of Surgery at Sardar Patel Medical College and A.G. Hospitals, Bikaner from December 2021 to December 2022. Cases of carcinoma breast in the general surgery department were recruited in the study. All the patients admitted in general surgical ward, with carcinoma breast requiring modified radical mastectomy were included in the study. Patients with carcinoma breast undergoing breast conservation surgery, undergoing radiotherapy, patients with carcinoma breast undergoing modified radical mastectomy after neo-adjuvant chemotherapy, patients with carcinoma breast undergoing palliative surgery/toilet mastectomy, and patients with carcinoma breast undergoing completion mastectomy were excluded in our study.

Patients undergoing flap fixation had flaps anchored to the underlying muscle using multiple rows of interrupted 2/0 polyglactin (Vicryl) sutures. Sutures were placed approximately 2.5 cm apart. Care was taken not to include the long thoracic nerve in the suture when

anchoring the axillary flaps. Patients having drainage had one or two suction drains sited beneath the mastectomy flaps and in the axilla. Drains were removed when draining <20 mL of serous fluid for 2 consecutive days. The effect of flap fixation over early drain removal and seroma formation is studied in a total of 100 patients with carcinoma breast who underwent modified radical mastectomy were included in this prospective study, and randomized into two groups, 50 patients with conventional simple wound closure (Group A) and 50 patients with flap fixation (Group B) were considered for the study.

The study was done after getting clearance from the hospital ethical committee. Informed consent was obtained from all the patients.

Statistical analysis

Statistical analysis was performed using t t-test and $p<0.05$ was checked for statistical significance of the obtained data.

RESULTS

The mean age of the patients in the case group was 51.00±12.93 years and the control group was 54.16±13.39 years. (0.233). out of a total of 100 patients in both groups 49 patients were from rural areas and 51 patients were from urban areas. The mean BMI of the patients in cases was 23.99±2.30 Kg/mt^2 and the control was 23.88±2.39 Kg/mt^2 (Table 1).

The mean duration of surgery of the patients in the cases group was 101.50±8.67 Min and the control group was 100.60±8.30 Min (p=0.321) (Fig. 1).

The mean intraoperative blood loss of the patients in the cases group was 495.50±20.51 ml and control group was 493.00±22.72 ml. The mean drain duration *in situ* of the patients in the cases group was 8.30±0.44 days and the control group was 12.60±0.80 days. (Table 2)

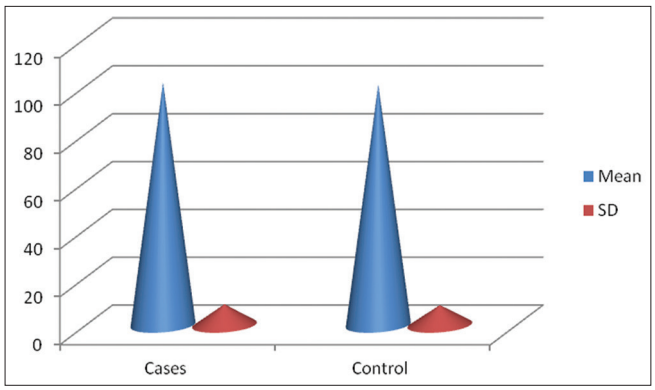

Fig. 1: Duration of surgery-wise distribution among study subjects

Table 1: Sociodemographic status of study subjects

Age (Years)	Cases	Control	P-value
Mean	54.16±13.39	51.00±12.93	0.233
Area			
Rural	24 (48.00%)	25 (50.00%)	0.99
Urban	26 (52.00%)	25 (50.00%)	
BMI (Kg/mt^2)	23.88±2.39	23.99±2.30	0.406

Table 2: Drain volume-wise distribution among study subjects

Drain	Cases	Control	p-value
volume (Ml.)	489.0±10.54	586.0±22.67	0.001
Duration (day)	8.30±0.44	12.60±0.480	0.0001*

The mean hospital stay of the patients in the cases group was 9.01±0.78 days and the control group was 13.30±1.28 days (Table 3).

Two (4.00%) patients in the cases group and eight (16.00%) patients in the control group seroma formation was present. One (2.00%) patients in the cases group and six (12.00%) patients in the control group wound infection was present. One (2.00%) patient in the cases group and one (2.00%) patient in the control group necrosis was present. The seroma formation-wise difference in both groups was found statically significant (p<0.05) (Table 4).

DISCUSSION

In the present study, the mean age of the patients in the cases group was 51.00±12.93 years and control group was 54.16±13.39 years. The age-wise difference in both groups was found statistically insignificant, which was in concordance with some of the earlier studies [8]. Our study showed a higher incidence of breast carcinoma in the middle-aged group. Baloch and Iqbal [9] also found the disease to be most common in middle-aged patients (40–59 years). This can be explained by the fact that breast cancer is a heterogeneous malignancy; its age-specific incidence profile rises exponentially until menopause and increases more slowly thereafter [10].

In the present study, the mean BMI of the patients in the cases group was 23.99±2.30 Kg/mt^2 and the control group was 23.88±2.39 Kg/mt^2. The BMI-wise difference in both groups was found statistically insignificant which was in concordance with some of the earlier studies [8].

The mean duration of surgery of the patients in the control group was 100.60±10.30 Min and the cases group was 101.50±8.67 Min. Our results were similar to the study conducted by Kiyingi *et al.* [11] and Huang *et al.*, [12] which showed no statistically significant difference.

The key to reducing seroma formation seems to lie in the obliteration of dead space partly. However, the techniques used to achieve this goal are subject to much controversy. This study demonstrates that the reduction of dead space after modified radical mastectomy using flap fixation reduces seroma formation.

In the present study, two (4.00%) patients in the cases group and eight (16.00%) patients in the control group seroma formation was present. The seroma formation-wise difference in both groups was found statically significant (p<0.05).

Similarly, Gonzalez *et al.* and Hashemi *et al.* reported that the only statistically significant factor influencing the development of seroma was the type of surgery [13]. The percentage of clinically significant seroma formation was 25/61 (40.9%). Flap fixation is associated with a lower incidence of seroma after mastectomy as compared with the control group (26.7% vs. 54.8%). The percentage observed was within the incidence range reported in the literature.

Table 3: Hospital stay among study subjects

Hospital stay (Day)	Cases	Control
Mean	9.01	13.30
SD	0.78	1.28
p-value	0.001	

Table 4: Complications seen among study subjects

Complication	Cases (%)	Control	p-value
Necrosis	1 (2.00)	1 (2.00)	0.99
Hematoma	1 (2.00)	1 (2.00)	0.99
Wound infection	1 (2.00)	6 (12.00)	0.111
Seroma	2 (4.00)	8 (16.00)	0.033*

Historically, Halsted suggested obliteration of the dead space particularly in the axilla to facilitate wound healing. Several investigators have also found that the flap fixation technique is useful in decreasing seroma formation. Recently, it was noted that there was a reduction in the incidence of seroma formation when flaptacking was done.

Purushotham *et al*. reported that breast surgery without drainage did not increase seroma formation if flaps were fixed with sutures [14]. The axillary flap fixation with sutures was found useful to avoid axillary drainage in patients undergoing breast conservation surgery and axillary lymph node dissection. Many methods have the potential to reduce the incidence of seroma. Inconsistent results have been reported for shoulder immobilization, pressure dressing, and high-versus low-pressure drainage. Other interventions such as fibrin sealant, bovine thrombin, and steroids were found ineffective. Carcoforo *et al*. reported that octreotide which is a long-acting somatostatin analogue was found useful in reducing the incidence of seroma [15]. Although many factors have been correlated with seroma formation, there was no risk factor supported by evidence, and it is a subject of controversy.

CONCLUSION

Flap fixation is a surgical technique that obliterates the dead space in patients undergoing modified radical mastectomy. It appears to reduce the total volume of fluid drained, the development of seroma, and the need for seroma aspirations.

However, this technique should be tried on a much broader scale to prove its validity in decreasing the incidence of seroma formation and its subsequent complications so that it can be introduced as a step in the mastectomy procedure.

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AUTHORS' CONTRIBUTION

All the authors have contributed equally.

CONFLICT OF INTEREST

The authors declare no conflicts of interest.

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