



QUILTING REDUCES POST-OPERATIVE SEROMA IN MASTECTOMY PATIENTS

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ABSTRACT

Background: The consensus development conference on treatment of breast cancer in 1979 stated that the modified radical mastectomy was the standard of treatment for stages I and II breast cancer. Surgeons have faced several problems such as seroma, hematoma, necrosis of the skin flap, breakdown of the wound, infection and they should be aware of the morbidity unique to mastectomy and axillary node dissection. One of the most frequently encountered complications following mastectomy is seroma formation. It causes significant morbidity, which may also lead to surgical site infection, delayed wound healing and frequent outpatient visits for seroma aspiration.

Objective: To evaluate the effect of surgical quilting after mastectomy in the prevention of postoperative seroma.

Methods-This was a single center prospective cohort study over a period of 1 year, with a sample size of 97. Considering the inclusion and exclusion criteria, patients with carcinoma breast presenting to the Department of General Surgery, ESIC-PGIMSRS Bangalore constitute the study group. Group 1 patients (quilting) had mastectomy flaps sutured to pectoral muscle using interrupted absorbable sutures. Seroma requiring aspiration, number of aspirations and volume aspirated were recorded postoperatively.

Results: During the study period, 97 patients were studied, with 54 patients in group 1 (quilting) and 43 patients in group 2 (non-quilting). The proportion of patients who developed seroma requiring aspiration was 69% (n=30) in the non-quilting group and 29% (n=16) in the quilting group ($p < 0.001$). Additionally, the total volume of seroma drained was 427 mL (standard error (SE)=69) in the non-quilting group and 63 mL (SE=21) in the quilting group ($p = 0.0008$).

Conclusion: Quilting of the mastectomy flaps significantly reduces seroma formation. Both total volume of seroma aspirated, and number of aspirations are significantly reduced using this technique.

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INTRODUCTION

Breast cancer is one of the most common malignancies in the world.¹ Accounts for 25% of cancers among females in India. Postoperative seroma is a common complication after mastectomy. Seroma formation (SF) - serous fluid collection under skin flaps or in the axillary dead space following mastectomy with axillary dissection which is detected either clinically or by imaging.² Incidence of seroma in post mastectomy patients is 25-60%.³

Historically, Halstead suggested obliteration of the dead space particularly in the axilla to facilitate wound healing.⁴ There are several techniques in practice that have been reported to prevent or reduce seroma formation, but no single method has been shown to be consistently and reliably effective. They can be discussed as surgical techniques, the use of sealants and sclerotherapy, compression dressing, the use of drains, shoulder exercise (delayed vs early) and the role of Octreotide.⁵

Conventional wound closure commonly uses single layer closure with 2 suction drain after mastectomy to prevent

seroma despite it frequently occurs after drain removal. Studies on seroma prevention on the obliteration of the dead space through fibrinogen, thrombin sealants, glues or tetracycline have poor results. Quilting is a surgical procedure that eliminates the anatomical dead space remaining after mastectomy. It involves placing interrupted absorbable sutures between the mastectomy flap and pectoral muscle prior to wound closure.⁶

The objective of the study was to evaluate the effect of surgical quilting after mastectomy in the prevention of post-operative seroma.

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MATERIALS AND METHODS

This study was conducted in ESIC PGIMSR & Model hospital, Bengaluru. It was a single center prospective cohort study. And the study period was from January 2018 to January 2019. Based on the previous studies and study duration, with statistical power of 0.80, 0.05 with 0.30 (medium) effect, a total of 97 patients were enrolled in the study. 54 in Quilting group and 43 in Non-quilting group by computer generated randomization. Ethical clearance from the institute was obtained.

Patients above 18 years of age, and willing to give to consent and patients with early breast cancer, locally advanced breast cancer were included in the study. Patients undergoing immediate breast reconstruction were excluded from the study. Intervention- After taking history with clinical examination, demographic data recorded, pre-operative work up was done. Data was collected and recorded on printed proforma. All patients consenting for surgery and met the inclusion criteria were given dose of Cefotaxime 1gm iv stat, 1 hour prior to surgery. They were divided into two groups- quilting and non-quilting.

All the patients underwent Modified Radical Mastectomy. Mastectomy flaps were raised using electrocautery and axillary lymph node dissection was done.

In Quilting group, After Mastectomy and axillary clearance, the upper and lower mastectomy flaps were sutured to the underlying pectoral muscles using vicryl 2-0, intermittent sutures, 5cms apart. Axillary space was obliterated by suturing lateral wall to the fascia of serratus anterior. The wound edges were approximated using staplers with one romovac suction drain placement.

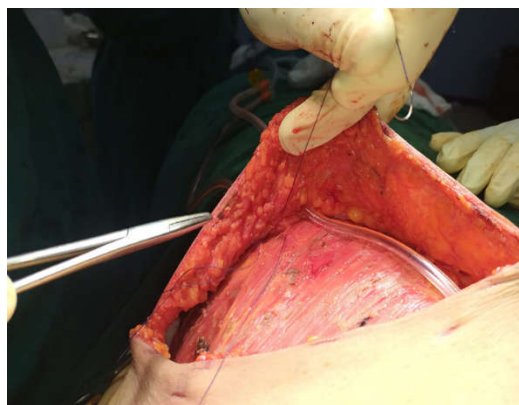
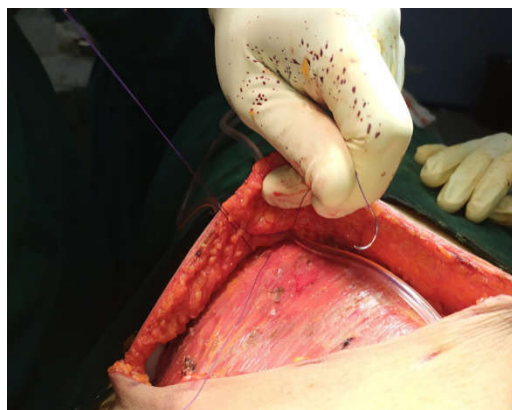


Fig 1 Illustrating quilting

In the non-quilting group, After Mastectomy and axillary clearance, quilting was not done, two romovac suction drains

were placed and the wound was approximated using staplers. Post operatively, both the group patients were discharged on post-operative day 5.

Outcomes-The data collected included patient's age, body mass index (BMI), duration of the procedure. All patients were routinely followed up, for immediate and late complications, including seroma, flap necrosis, surgical site infection. Seroma was recorded when detected either clinically or sonographically (on routine postoperative ultrasound evaluation). If seroma was diagnosed, we recorded the number of them requiring aspirations, the total aspirated volume, volume of the drain on day 1, duration of drain in situ.

Statistical analysis

Data was analyzed using descriptive and inferential statistics. The categorical data expressed in terms of frequency and percentages. Risks are calculated in terms of odd ratio considering non-quilting as conventional procedure and control category along with 95% CI. For all statistical evaluations, a p-value < 0.05 is considered as statistically significant. All data analyzed using statistical package SPSS - 20.

RESULTS

The mean age of patients in quilting group, was 57.8 years and among non-quilting group was 56.3 years (p= 0.09). The BMI of patients among quilting group was, 27.5kg/m² and among non-quilting group was 28.1 kg/m² (p=0.85). The operative time, it was more in quilting group 127mins(90-160mins) when compared to the non-quilting group 105 mins(80-140 mins). Volume of the drain on day 1 in quilting group was 230+/-112ml and in the non-quilting group, it was 425+/-143ml. The duration of drain in situ was shorter in the quilting group, i.e., 9 days and among the non-quilting group it was 11 days, and the difference was significantly higher. Similarly, the number of patients who developed seroma were 15(27.8%) among the quilting group and it was 28(65.2%) among the non-quilting group, with p value < 0.001. The mean volume of seroma aspirated was 63 ml among the quilting group and 427ml among the non-quilting group, with p- 0.0021. There was no significant difference among the two groups between flap necrosis and surgical site infection.

	Table 1	Patient characters	
	Quilting (54)	Non-Quilting (43)	p-value
Mean Age	57.8±8.4	56.3±4.9	0.09
BMI	27.5±4.3	28.1±6.2	0.85

Table 2- Operative characters			
	Quilting (54)	Non-Quilting (43)	p-value
Mean operative time in mins	127	105	<0.001
Drain volume in ml on day 1	230	425	<0.001
Drain duration in days	9	11	0.001
Seroma requiring aspiration	15	28	<0.001
Mean volume of fluid aspirated	63	427	0.0021
Flap necrosis	5	6	1
Surgical site infection	18	16	0.8

DISCUSSION

This study was mainly carried out to study the efficacy of quilting in reducing the post-operative seroma. Several trials used adhesive glues and sclerosant agents to reduce the post mastectomy seroma. However, a recent meta-analysis showed that such preventive techniques are still not convincing. Use of electro-cautery was associated with high incidence of seroma.

The pathophysiology of seroma is that, it is multifactorial. It could be due to the following reasons- shearing of skin flaps and underlying muscle, surgically created dead space, use of diathermy, the extent of axillary dissection and malignant lymph node involvement, tissue disruption, the extent of chest wall dissection, use of electrocautery, disruption of lymphatic and vascular channels and protein exudation.

In our study, the incidence of seroma among the quilting group was 27.5% when compared to the non- quilting group, i.e., 65.2%. This falls in line with the previous trials where the reduction of dead space by quilting will reduce seroma. Many different types of drain, such as low-pressure suction, high pressure suction, closed tube, corrugated drains and multiple numbers of drains have been used to find the best technique to prevent seroma formation. Studies have shown that the presence or absence of suction drains does not make any significant difference to seroma formation, nor is any one type of drain superior to another in preventing seromas.

The duration of drain in the quilting group was shorter, i.e., 9 days when compared to the non- quilting group, i.e., 11 days. The operative time was more in quilting group, i.e., 127 mins and non-quilting group was 105 mins. The drain volume on day 1 was significantly more in non-quilting group, 425ml. The total volume of seroma aspirated was significantly higher in the quilting group (427ml) when compared to the non-quilting group (63ml). The above findings were compared with other trials, which also had less incidence of seroma formation among the quilting group.

CONCLUSION

To conclude, seroma following mastectomy is a persistent problem and quilting the mastectomy flaps to the underlying muscle significantly obliterates the dead space and hence reduces the seroma formation. It is therefore advisable to do quilting following every Modified Radical Mastectomy procedure.

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