Benha Journal of Applied Sciences (BJAS) **print: ISSN 2356–9751**
Vol. (9) Issue (2) (2024), (117-123) **online: ISSN 2356–976x**
http://bjas.bu.edu.eg

Comparative Study Between The Conventional Modified Radical Mastectomy And Modified Radical Mastectomy With Quilting Technique To Axillary Skin Flap In Reduction Of Postoperative Seroma In Surgical Management Of Breast Cancer

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Abstract

seroma is the most common complication following breast surgeries especially modified radical mastectomy which cause many issues to the patient such impair healing of the wound and may be infected , in an attempt to reduce seroma formation we worked on reducing the dead space to decrease the amount of seroma formation by quilting technique to the axillary skin flaps to the serratus anterior muscle following modified radical mastectomy as treatment of breast cancer

Key words: seroma, dead space and quilting technique

1.Introduction

Of all female malignancies, 22.9% are breast cancer and 37.7% are found in Egypt, making it the most frequent malignancy in women. It accounts for 19% of cancer-related fatalities in Egypt [1-3].

One explanation for the dramatic rise in instances after 1970 is the prevalence of contemporary lifestyles [4].

The reported frequency of seroma development after breast surgery ranges from 15.5% to 90%, making it the most prevalent complication after breast cancer surgery, particularly after MRM. A seroma is an abnormal buildup of serous fluid in the axilla, breast, or dead space of a skin flap after a mastectomy, resection, or biopsy [MSR or BCS]. Breast surgery may cause seroma production in any confined area due to the breast's high lymphatic outflow to the axillary, supraclavicular, and internal mammary nodal basins from the intramammary lymphatics. One possible explanation for the production of seroma in lymphatic fluid collections is the low fibrinogen levels and net fibrinolytic activity [5]. Seroplasma may be found in the confined areas of incisions in the axilla as well as in the anterior chest wall hollow that remains after a mastectomy [6].

It is common practice to leave drains in place after a mastectomy or axillary surgery to remove any fluid accumulation that may have formed beneath the skin flaps. This helps the wounds heal more quickly. Less drainage occurs after 1–3 weeks, indicating that the skin flaps have healed and attached to the chest wall. When seroma collections form after drain removal, percutaneous aspiration is a viable option for managing them. The mastectomy and axillary incisions are often insensate, thus aspiration is generally well-tolerated. The treatments may be repeated as needed to make sure the skin flaps are firmly adhered to the chest wall. Based on published series and the thorough evaluation conducted by Pogson and colleagues [5], seroma aspiration is required in 10% to 80% of ALND and mastectomy patients. There seems to be a reduced chance of seroma development with axillary surgery that only involves the SLN biopsy; nevertheless, as this technique is often done without drain installation, some patients may need later seroma aspiration [7]. Several researchers have looked at ways to reduce seroma production, which might cut down on the amount of time drainage catheters are required or perhaps eliminate their necessity completely, as we'll see later on.

Seroma is a nuisance for the sufferer since it restricts their range of motion, causes pain, and requires many skin punctures to drain. This causes a postponement of adjuvant radiation or chemotherapy for a few weeks and necessitates several outpatient appointments. Additionally, arm lymphoedema, delayed wound healing, increased infection risk, wound dehiscence, skin flap necrosis, chronic discomfort, and prolonged seroma development are all possible outcomes [8].

2. patient and methods

Forty female patients who were hospitalized to the Surgical Oncology Unit at Benha University Hospitals and Damnhour Oncology Center between November 2022 and October 2023 and were referred to MRM were the subjects of this research.

Research Methodology: prospective observational study

Using a blind card method, the patients were split evenly into two groups:

Twenty individuals were part of Group A and had their axillary skin flaps quilted to the underlying muscles.

Twenty patients in Group B were closed skin and subcutaneously using the standard procedure.

The research included forty female patients who had operable breast cancer as determined by a thorough medical history, physical exam, imaging testing (mammogram and/or MRI), and a biopsy (FNAC or tru-cut biopsy). The metastatic work up, which included ultrasonography (US) of the belly, computed tomography (CT) of the chest, and, if necessary, a bone scan, was used to rule out metastasis.

Inclusion in the research was contingent upon the patients' receipt of neoadjuvant treatment for locally advanced breast cancer.

Standard laboratory testing was performed on all patients, including: i. a full blood profile.

ii. Profile of bleeding and coagulation.

part iii. Blood sugar levels while fasting.

iv. Blood urea nitrogen and creatinine, which measure renal function. v. If necessary, liver function tests including ALT, AST, serum albumin, and serum bilirubin are performed.

Patients were randomly assigned to either group A or group B using the double blind envelop technique, after informed patient agreement.

3.Operative details

- After induction of anaesthesia, and once the patient is prepared with povidone iodine and draped with sterile sheets, An elliptical incision made which included the nipple areola coplex and the prior core biopsy site this incision extends from nearly 3 cm near from the sternum to the anterior axillary line
- Upper flap raised in avascular plane to the clavicle and lower flap also raised in avascular plane nearly 3 cm below the breast fold and lateral flap raised till appearance of latissmus dorsi muscle
- Then dissection of the breast tissue away from the chest wall and the pectoral fascia also removed saving the pectoral muscle
- Then incision of the clavi-pectoral fascia and enterance to the axilla then dissection to level 1 and 2 of axillary lymph nodes after identifying the axillary vein and saving the long thoracic nerve and thoraco dorsal bundle then hemostasis using both diathermy coagulation and ligature.
- After completion of MRM; group A patients underwent suturing of axillary skin and subcutaneous flaps to underlying muscles (quilting) using running sutures, polyglycolic acid (vicryl sutures), size 2/0 (axillary skin flaps to serratus anterior muscle). The sutures, were started Caudally (saving the long thoracic neve) to cranially
- The rows were placed longitudinally from the caudal to the cranial end of the wound with 2 cm between them, totalling some two to three rows for the axillary flap.

4.complications

1)Wound Infections

Rates of postoperative infections in breast and axillary incisions have ranged from less than 1% of cases to nearly 20% and Use of preoperative antibiotic coverage to minimize infection rates has been evaluated in multiple prospective, randomized, controlled trials

2) seroma

Seroma is the commonest complication following breast cancer surgery, especially after MRM, the reported incidence of seroma formation after breast surgery varies widely from 15.5% to 90.

Seroma formation under the skin flaps of axillary or mastectomy wounds impairs the healing process; therefore drains are usually left in place to evacuate postoperative fluid collections.

3) hmatoma

Widespread use of electrocautery has reduced the incidence of hematoma formation in breast surgery dramatically, but this complication continues to occur in 2% to 10% of cases.

4) chronic pain

A minority of breast cancer patients experience chronic incisional pain that can be quite debilitating and refractory to standard analgesics, lasting for several months to years postoperatively.

5) wound dehiscence

It is partial or total disruption of any or all layers of the operative wound closure and state of wound healing are the most important factors that influence wound dehiscence

6) skin flap necrosis

Wound closure under tension, extensive dissection of skin flaps and smoking are important risk factors for impaired wound healing and necrosis of skin flaps or margins

7)Lymphedema

Upper extremity lymphedema is the complication that has generated the most concern after ALND .The risk of lymphedema is greater after a higher-level axillary dissection than after less extensive surgery but has been reported to occur even after axillary surgery limited to the SLNs

8)Neuro-Vascular Injuries

The axillary dissection surgical bed exposes the axillary vein thoracodorsal, long thoracic (‘‘nerve of Bell’’), and intercostobrachial nerves, as well as the neurovascular bundle to the pectoralis musculature

Outcomes

3.Demographic data:

Age:

In this study, patients' ages ranged from 35 to 85, with a mean of 54.43. Seventy percent of the patients were in the age bracket of forty to sixty Figure (16). When comparing the two groups according to age, no statistically significant differences were found Table (1).

Table (1) Compare the two groups in terms of age at presentation (Table 1).

	Total (n = 40)		**Group A(n= 20)**		**Group B(n= 20)**			
	No.	**%**	**No.**	**%**	**No.**	**%**	**Test ofsig.**	**p**
Age (years)								
<40	3	7.5	2	10.0	1	5.0		
40 – 60	28	70.0	11	55.0	17	85.0	□□□	MC$_{p=}$
>60	9	22.5	7	35.0	2	10.0	4.328	0.108
Min. – Max.	35.0 – 85.0		39.0 – 78.0		35.0 – 85.0			
Mean ± SD.	54.43 ± 10.53		56.0 ± 10.72		52.85 ± 10.4		t= 0.945	
Median	53.0		57.0		51.0			0.351

Chi-square test p-values for comparing the two groups, as well as □》 and p. Monte Carlo entails a chi-square test. Student's t-test p-values for comparing the two sets of data

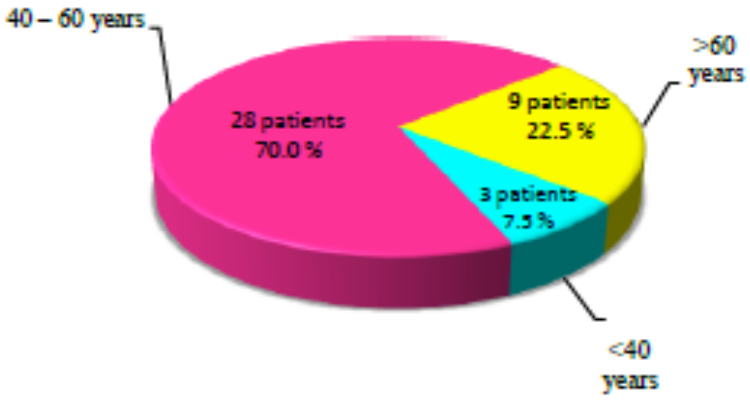

Fig. (1) Presented in a distribution of the cases that were analyzed based on the age of presentation in years.

History of oral contraceptive pills (OCPs) intake

Out of the total number of patients surveyed, 14 reported a history of OCP use (35%), whereas 26 reported no such history (65%).

In terms of OCP usage, there was no statistically significant difference between the two groups that were examined (□□ =0.0 & p=1.000).

My family tree:

Thirteen patients (27.5%) had a first- or second-degree relative with breast cancer, whereas twenty-nine patients (72.5%) had no such history.

In terms of family history, there was no statistically significant difference between the two groups that were examined (ぎく =0.125& p=0.723).

Health problem:

Out of the total of 23 individuals, 57.5% had a co-occurring medical condition; this included 17 diabetics (42.5%), 18 hypertensives (45%) and 3 patients with cardiac issues (7.5%).

In terms of co-occurring medical conditions, neither group differed significantly from the other Table (2).

Table (2) Comparison of the two groups examined based on the medical conditions.

	Total (n=40)		**Group A(n= 20)**		**Group B(n= 20)**		□□	
	No.	**%**	**No.**	**%**	**No.**	**%**		**p**
Medical illness								
No	17	42.5	8	40.0	9	45.0		
Yes	**23**	**57.5**	**12**	**60.0**	**11**	**55.0**	□□□□□	1.000
DM	17	42.5	13	65.0	4	20.0	1.129	0.288
HTN	18	45.0	7	35.0	11	55.0	1.616	0.204
Cardiac	3	7.5	3	15.0	0	0.0	3.243	^{FE}p=0.231

Chi-square test p-values for comparing the two groups, as well as □》 and p. Chi-square test using Fisher's exact test (FE).

Clinical presentation:

The most prevalent first symptom reported by every single patient was the sensation of a painless lump in their breast. Additionally, there were cutaneous indications, drainage, and discomfort that presented themselves. Six individuals had these issues; the details may be seen in Table 3.

Table (3) The clinical presentation-based case distribution is shown in Table (3).

	Total (n=40)		Group A(n= 20)		Group B(n= 20)		FE_p
	No.	%	No.	%	No.	%	
Complain							
Lump	40	100.0	20	100.0	20	100.0	-
Pain	2	5.0	2	10.0	0	0.0	0.487
Discharge	1	2.5	1	5.0	0	0.0	1.000
Skin Manifestatios	3	7.5	1	5.0	2	10.0	1.000

Chi-square test p-values for comparing the two groups, as well as □》 and p. Chi-square test using Fisher's exact test (FE).

Breast size:

The distribution of the patients evaluated according to bra cup size is shown in Figure (18). Bra size B and C were the most common among the patients. Table (4) shows that there was no statistically significant difference in breast size between the two groups.

Table (4) Breast size comparison between the two groups.

	Total (n=40)		Group A(n= 20)		Group B(n= 20)		□□	MC_p
	No.	%	No.	%	No.	%		
Breast size								
Cup A	4	10.0	0	0.0	4	20.0		
Cup B	11	27.5	5	25.0	6	30.0		
Cup C	22	55.0	13	65.0	9	45.0	2.336	0.609
Cup D	3	7.5	2	10.0	1	5.0		

Chi-square test p-values for comparing the two groups, as well as □》 and p. Monte Carlo entails a chi-square test.

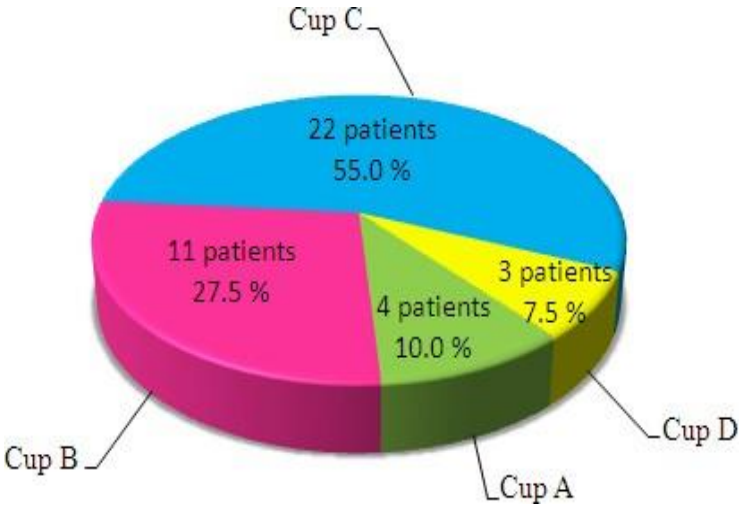

Fig. (2) shows the two groups compared with respect to breast size.

Characteristics of the primary tumor:

Of all the tumor locations, 21 instances were located in the upper outer quadrant (52.5). Figure 19 shows that the lower inner quadrant was the place with the fewest cancers, with just 2 instances (5% of the total) having tumors there. Concerning the location of the tumor, neither group differed significantly from the other Table (7).

In terms of tumor size, there was no statistically significant difference between the quilted and control groups (p=0.059) (Table 7; Figure 20).

There was no statistically significant difference between the quilted group and the control group in terms of the existence of suspicious lymph nodes pre-operatively; nevertheless, thirteen patients in the quilted group and nine patients in the control group exhibited this finding, for a total of twenty-two (55%).

Table (5) This table compares the two groups based on the main tumor's features.

	Total (n=40)		Group A(n= 20)		Group B(n= 20)		Test ofsig.	MC$_p$
	No.	%	No.	%	No.	%		
Quadrant								
UOQ	21	52.5	11	55.0	10	50.0		
UIQ	7	17.5	4	20.0	3	15.0		
Central	3	7.5	1	5.0	2	10.0	□□= 3.615	0.519
LOQ	7	17.5	4	20.0	3	15.0		
LIQ	2	5.0	0	0.0	2	10.0		
Lump size (cm)								
Min. – Max.	1.0 – 6.0		1.0 – 6.0		1.50 – 6.0			
Mean ± SD.	2.82 ± 1.30		2.43 ± 1.12		3.21 ± 1.38		t=1.948	0.059
Median	2.50		2.25		2.75			
Axillary L.Ns								
Free	18	45.0	7	35.0	11	55.0	□□= 1.616	0.204
Suspicious	22	55.0	13	65.0	9	45.0		

Chi-square test p-values for comparing the two groups, as well as □》 and p. Monte Carlo entails a chi-square test.

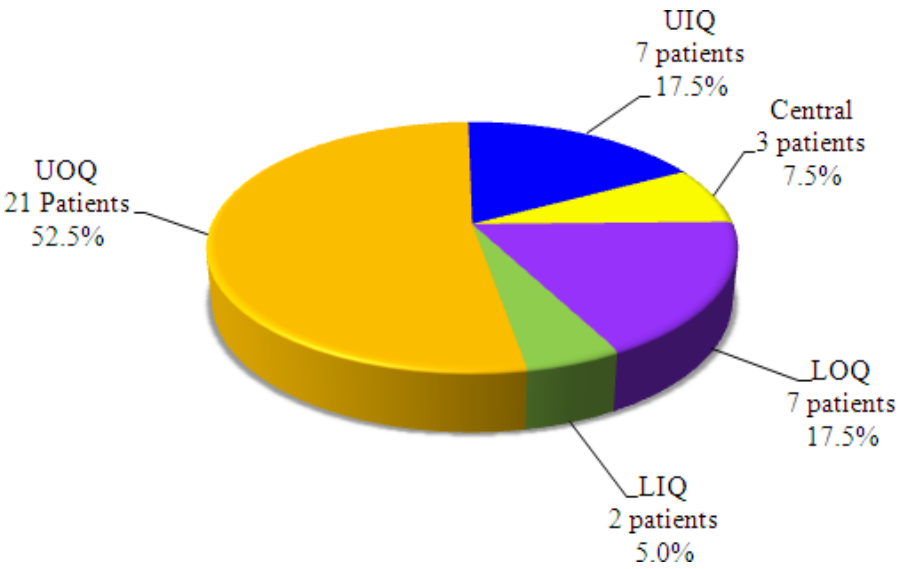

Fig. (3) Distribution of the patients analyzed according to the location of the tumor .

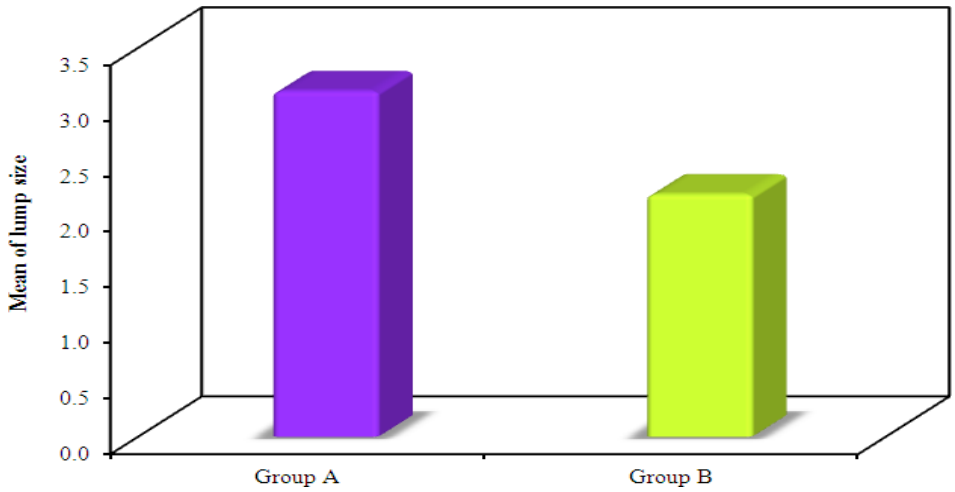

Fig. (4) Comparison of the two groups based on lump size.

Microcalcifications:

In 6 instances (15%), mammograms showed either localized or diffuse microcalcifications; however, there was no statistically significant difference between the two categories Table (6).

Table (6) Study group comparison based on mammography-confirmed presence of microcalcifications.

	Total (n=40)		Group A(n= 20)		Group B(n= 20)		FE_p
	No.	%	No.	%	No.	%	
Micro calcification							
No	34	85.0	16	80.0	18	90.0	
Yes	6	15.0	4	20.0	2	10.0	0.661

Chi-square test p-values for comparing the two groups, as well as □》 and p. Chi-square test using Fisher's exact

Clinical staging:

There was no statistically significant difference between the two groups when looking at pre-operative staging according to the TNM classification method; Table (7) reveals that the majority of the operated patients were in stages II and III.

Table (7) Comparison of the two groups according to clinical stage Table (7)

	Total (n=40)		Group A(n= 20)		Group B(n= 20)		MC_p
	No.	%	No.	%	No.	%	
Clinical stage							
Stage I	7	17.5	2	10.0	5	25.0	
Stage II	17	42.5	7	35.0	10	50.0	0.167

Chi-square test p-values for comparing the two groups, as well as □》 and p. Monte Carlo entails a chi-square test.

Neoadjuvant chemotherapy:

There was no statistically significant difference in the intake or reaction to neoadjuvant chemotherapy between the two groups of seven quilted patients and eight control patients who had the treatment Table (8).

Table (8) Case distribution based on neoadjuvant chemotherapy intake and response Table (8)

	Total		Group A		Group B		Test ofsig.	p
	No.	%	No.	%	No.	%		
Neoadjuvant Chemotherapy	**(n=40)**		**(n= 20)**		**(n= 20)**			
No	25	62.5	13	65.0	12	60.0	□□□	
Yes	15	37.5	**7**	**35.0**	**8**	**40.0**	□□□□□	0.744
Response	**(n=40)**		**(n= 20)**		**(n= 20)**			
Complete	1	2.5	1	5.0	0	0.0	□□□	$FE_{p=}$
Partial	14	35.0	6	30.0	8	40.0	□□□□□	0.467

Chi-square test p-values for comparing the two groups, as well as □》 and p. Chi-square test using Fisher's exact

3. Discussion

The overall incidence of Clinically significant seroma in our study was (55%) which comes within range of reported incidences mentioned above. Quilting technique is associated with lower incidence of CSS (35%) after mastectomy as compared to the control group (75%). In case of patients who developed seroma,

The mean number of aspirations, the mean fluid volume aspirated and the duration of seroma decreased significantly in the quilted compared to the control group.

In this study, also we found that; quilting technique significantly decreases the daily drain output in the initial 3 PODs with mean drainage volume of 357 ml in quilted group versus 414 ml in control group. These results does agree with the results obtained from the Chinese RCT recorded by Gong Yam et al which revealed that drainage rates in the quilting group was reduced in the first 72 hours following mastectomy

Our study also revealed that axillary quilting technique significantly decreases the total amount of fluid drained with mean drainage volume of 723 ml in the quilted group versus 2284 in the control group. Ackroyd et al reported that the total drainage volume may reach up to 5 liters if the technique of flap fixation was not used

Final Thoughts

Compared to the standard method of closure after MRM, the quilting approach has the following benefits:

It has a noticeable effect in reducing the daily drain output in the first three days after surgery.It allows the drains to be removed early by drastically reducing the overall volume of fluid that is drained.It shortens the time it takes for seromas to develop and speeds them up considerably.The amount of fluid aspirated and the frequency of aspirations are both reduced dramatically.

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