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Original Article

Evaluation of Different Techniques for Reducing Seroma Formation after Modified Radical Mastectomy.

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ABSTRACT

Background: Seroma is the most common complication occurring after surgery for breast cancer, leading to patient discomfort, recurrent aspirations with the risk of inflammations, long hospital stay, delayed wound healing, skin flap damage, delay in treatment with adjuvant therapies, and high surgical costs. The purpose of our study is short term follow up" within two months after operation" to compare the effectiveness of using Tetracycline and reducing the dead space in reducing seroma after Modified Radical Mastectomy (MRM).

Patients and methods: Interventional study was applied on 56 females having breast cancer to evaluate different techniques for reduction of seroma formation after modified radical mastectomy at department of general surgery, Zagazig University Hospitals, during the time from October 2018 to April 2020. Patients were divided into two groups each one enrolls 28 patients Group A: we used tetracycline, suction drain and tight bandage while in Group B: we used mechanical closure of dead space, suction drain and tight bandage. All patients were subjected to history taking, complete clinical examination, Laboratory tests and breast ultrasound.

Results: In this study the percentage of seroma occurred in total cases was (26.8%) this is considered good results when compared to worldwide percentage (73%). In group A (Tetracycline) seroma occurred in 32% of 28 cases and 21.4% of 28 cases in group B.

Conclusion: There was no significant difference between using Tetracycline and closing the dead space in decreasing seroma formation after MRM.

Key words: Mastectomy, Seroma, tetracycline, mechanical closure, M\RM.

INTRODUCTION

Seroma is the most common problem occurring after dissection of axillary lymph node, defined as an accumulation of serous fluid containing blood, plasma and/or lymph fluid under the skin flaps or in the axillary space, excess fluid accumulation usually stretches the skin flaps [1, 2]**.** The incidence of seroma after breast surgery varies greatly, ranging from 3% to more than 90% [1]**.**

Seroma formation lead to patient discomfort, frequent seroma aspirations with the risk of inflamation, long hospital stay, impaired wound healing, skin flap damage and delay in receiving adjuvant therapies which increases costs for the patient and healthcare system [2-5].

Recently, many studies on effective techniques to reduce seroma formation. All appear to have one common denominator: closure of the dead space, suction drain, quilting of the skin flaps, use of antibiotics as Tetracycline, adhesive tissue glues like fibrin glue, natural coagulation factors and Octreotide [6-10]**.** So the aim of the current study was assessment short term follow up" within two months after operation" to evaluate the effectiveness of using Tetracycline and closure of the dead space in reducing seroma after Modified Radical Mastectomy (MRM).

PATIENTS AND METHODS

After approval was taken from the ethical clearance committee and consent was taken from all the patients after patient counseling. Interventional

study was carried out between the period from October 2018 and April 2020 in the department of general surgery at Zagazig University Hospitals. Included 56 females with breast cancer for evaluate two techniques for reduction of Seroma formation after modified radical mastectomy and allocated in two groups; Group A: 28 cases with tetracycline, suction drain and tight bandage. Group B: 28 cases with mechanical closure of dead space, suction drain and tight bandage. Patient's age was distributed as (56.32 ± 8.28) and (52.7 ± 10.34) respectively, majority of patients in both groups were post-menopausal (85.7%) in group (A) and (75%) in group (B) respectively. Written informed consent was obtained from all participants, the study was approved by the research ethical committee of Faculty of Medicine, Zagazig University. The study was done according to The Code of Ethics of the World Medical Association (Declaration of Helsinki) for studies involving humans.

Inclusion criteria: All patients with breast cancer and treated with modified radical mastectomy (MRM). **Exclusion criteria:** Any breast cancer surgery other than modified radical mastectomy and patients who refused the study.

All patients were subjected to history taking, complete clinical examination, Laboratory tests including Complete Blood Count (CBC), Liver Function Tests (LFTs), Kidney function tests (KFTs), PT, PTT and INR, Hepatitis markers, Random blood sugar. Radiological investigations: breast mammogram, breast ultrasound, dynamic breast MRI (if indicated), FNA cytology.

Technique:

Less use of electrocautery during mastectomy. Limit dissection below the level of Axillary vein. when the anterior surface of the axillary vein was exposed, sharp better than blunt dissection was performed, bleeding vessels and fat pads were clipped and ligated. The anterior edge of the latissimus dorsi muscle was identified with electrocautery. The thoracodorsal vein, with its accompanying artery and nerve forming the thoracodorsal neurovascular bundle was identified and preserved. The long thoracic nerve, usually identified and preserved lying against chest wall. The dissection was then completed by freeing the inferior axillary contents from the chest wall.

In group (A); Irrigation of the wound with 2g Tetracycline caps on 100 cm saline, Fig (1).

In group (B); Vicry l interrupted sutures (zero) are used to suture the anterior edge of the latissimus dorsi muscle to chest wall, anterior to the long thoracic nerve to close the dead space in the axilla. Vicryl sutures (zero) at periodic intervals (3 cm apart) are sutured from the skin flap to the underlying pectoralis major muscle. Multiple rows were done to close all the dead space under the skin flap, Fig (2). Insertion of suction drain lateral to axilla, Fig (3). Applying tight bandage over the flaps and axilla Fig (4).

Postoperative follow-up:

We followed up all patients in our study from the first day post-operative till two months after operation. Follow up was by clinical examination and postoperative ultrasound on the surgical site. All finding data are recorded.

Statistical analysis:

Data collected through history, clinical examination, laboratory tests and outcome results coded, entered, and analyzed using Microsoft Excel software. Data were then entered into Statistical Package for the Social Sciences (SPSS version 20.0). According to the type of data qualitative represent as number and percentage, quantitative continues group represent by mean ± SD, the following tests were used to test differences for significance; difference and association of qualitative variable by Chi square test (X^2). Differences between quantitative independent groups by (t) test, (P) value was set at <0.05 for significant results & <0.001 for high significant result.

RESULTS

Table 1 showed that there was no significant difference between groups regard any items as; Majority of both groups was at right side. Regard BIRAD majority of both groups were grade 4 & 5, and grade III represent about two thirds of both groups. Both groups were positive regard LN.

Table 2 A Visual Analogue Scale (VAS) is a measurement instrument (score from 0 to 10) that used to measure a characteristic or magnitude that is believed to range across a continuity of values and cannot be directly measured. It is often used to measure the intensity or frequency of various symptoms.

Table 3 showed that there was no significant difference between groups regard duration or amount as; duration was distributed as (5.96±1.31) and (5.89±1.06) respectively. Amount was distributed as (1010.71±330.0) and (973.21±299.22) respectively.

Table 4 showed that there was no significant difference between groups.

Table 1: Clinical and tumor characters distribution of both groups:

			GROUP		Total	X^2	P
			Group A	Group B			
Side	Bilateral	N	2	1	3		
		%	7.0%	3.5%	5.3%		
	Left	N	9	11	20	0.56	0.75
		%	32.1%	39.2%	35.7%		
	Right	N	17	16	33		
		%	60.9%	57.3%	59.0%		
BIRAD	IV	N	12	12	24		
		%	42.9%	42.9%	42.9%		
	V	N	16	16	32	0.00	1.00
		%	57.1%	57.1%	57.2%		
GRADE	II	N	9	11	20		
		%	32.1%	39.3%	35.7%		
	III	N	19	17	36	0.31	0.57
		%	67.9%	60.7%	64.3%		
LN	-VE	N	0	0	0	0.00	
		%	0.0%	0.0%	0.0%		1.0
	+VE	N	28	28	56		
		%	100.0%	100.0%	100.0%		
Total		N	28	28	56		
		%	100.0%	100.0%	100.0%		

Table 2: Post-operative VAS (visual analogue scale) distribution between groups:

	Group A N=28	Group B N=28	t	P
VAS	5.39 ± 0.62	2.39 ± 0.49	19.799	0.00**

Table 3: Drainage duration and amount distribution between groups:

	Group A N=28	Group B N=28	t	P
Drain duration/ Days	5.96 ± 1.31	5.89 ± 1.06	0.223	0.824
Drainage amount	1010.71 ± 330.0	973.21 ± 299.22	0.404	0.688

Table 4: Seroma at 2 months follow up distribution between groups:

			GROUP		Total	X^2	P
			Group A	Group B			
Seroma 2M	-VE	N	19	22	41		
		%	67.9%	78.6%	73.2%		
	+VE	N	9	6	15	0.82	0.36
		%	32.1%	21.4%	26.8%		
Total		N	28	28	56		
		%	100.0%	100.0%	100.0%		

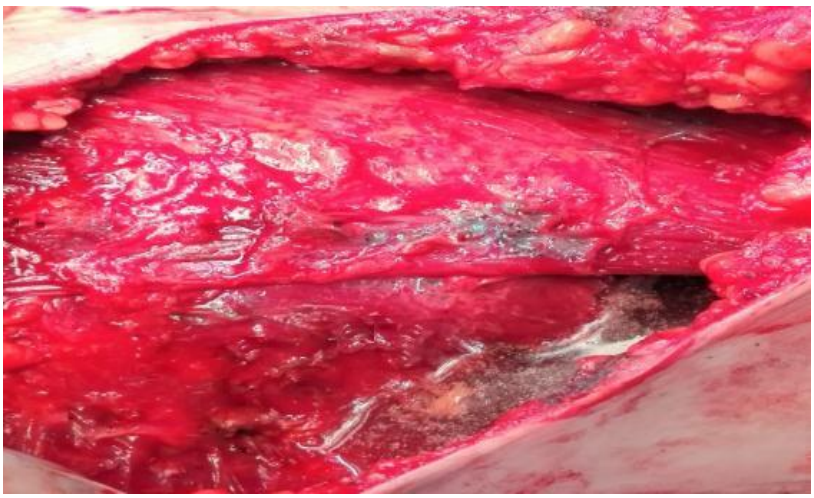

Figure (1): Shows (a): Irrigation with Tetracycline (2gm+100cm saline) and (b): Pectoralis major muscle.

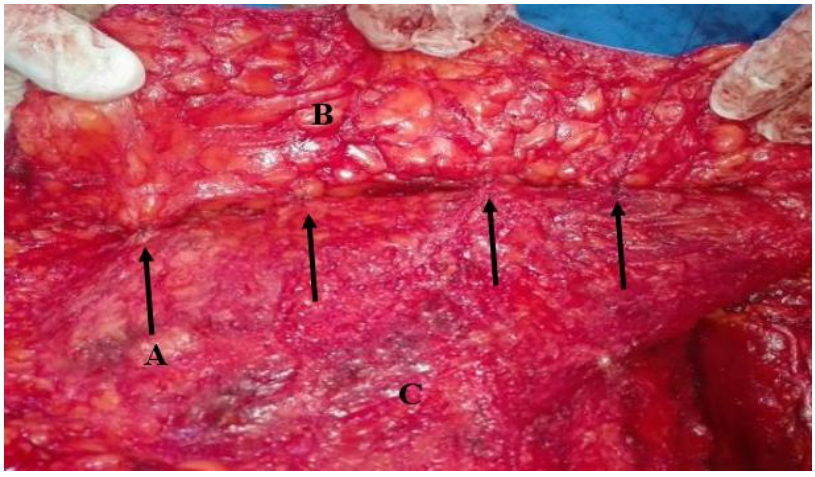

Figure (2): Showed (a): Suturing the skin flap to the underling muscle to close the dead space, (b): Skin flap and (c): Pectoralis major muscle.

DISCUSSION

Clinical and tumor characters; The malignant mass was on the right side in 33 cases of total cases (59%), 17 cases in group A and 16 cases in group B. On the left side in 20 cases of total cases (35.7%), 9 cases in group A and 11 cases in group B. Bilateral in 3 cases of total cases (5.3%), 2 cases in group A and 1 case in group B. By ultrasonographic examination, 24 cases of total cases (42.9%) were BIRAD IV and 32 cases of total cases (57.2%) were BIRAD V. Also 20 cases of total cases (35.7%) were grade II, and 36 cases of total cases (64.3%) were grade III. Lymph nodes were positive in all cases with percentage 100%. The results showed that there was no significant difference between the two groups regards to the site of malignant mass, BIRAD classification or grading of the tumor.

This was in agreement with **Hashemi et al,** [11] who found **that** there was no relationship between the occurance of seroma after cancer breast surgery and the patients' age, tumor size, tumor grading, and lymph node involvement.

Post-operative pain: Post-operative pain was significantly higher at group A than group B as Tetracycline may be considered a foreign body inside the wound and the sclerotic effect of Tetracycline to the tissue. VAS was (5.39±0.62) in group A and (2.39±0.49) in group B. This was in agreement with **McCarthy PM et al,** [12] who found that sclerosant effect by tetracycline is not effective and lead to severe postoperative pain. This was in disagreement with **Rice et al,** [13] who found that there were no differences between groups according to the severity of postoperative pain, wound infection, or seroma occurance one month postoperatively.

Duration and Amount; After the operation, the amount of fluid drained by the suction drain was distributed as (1010.71 ± 330.0) ml in group (A) and (973.21 ± 299.22) ml in group (B). Time of drain removal was after (5.96 ± 1.31) days in group A and (5.89 ± 1.06) days in group B. So, there was **no** significant difference between groups regard the duration of suction drain or amount of fluid in our study. This was in agreement with **Kelley et**

al, [14] who found that there was **no** significant difference between groups regard duration of suction drain or amount of fluid. But **Peeters et al,** [15] in which **Gupta et al**. [16] compared **5** against **8** days wound drainage compared **3** versus long-time drainage. Both recommendations were in the favor of long-time drainage because less aspirations of seroma were needed.

Seroma at 2 months follow up; the incidence of seroma after MRM reported worldwide has been up to 73% **Nadkarni et al,** [17]. After 2 months follow up, we found that **no** seroma was accumulated at site of operation in 41 cases with percentage **(73.2%)** of total cases. However, seroma was occurred in 15 cases of total cases (26.8%) distributed as; 9 cases in group (A) (32% of 28 cases), 6 cases in group (B) (21.4% of 28 cases).

Hashemi et al, [11], 158 breast cancer patients were included into the study and 55 patients had seroma, with overall incidence of 35% for seroma occurance after breast cancer surgery.

In this study the percentage of seroma occurred in total cases was 26.8%, this is considered good results when compared to worldwide percentage (73%) and **Hashemi et al,** [11] results (35%).

In group A (Tetracycline) seroma occurred in 32% of 28 cases and 21.4% of 28 cases in group B. So, there was no significant difference between groups. This agreed with **Nadkarni et al,** [17] who concluded that suturing of skin flaps to pectoralis major muscle was effective in obliterating dead space, but not considered the cosmetic results after such operations.

CONCLUSION

There was no significant difference inbetween using Tetracycline instillation and mechanically closing the dead space in reducing seroma formation after MRM, but they are supposed to have better prognosis than traditional well-known techniques. Limit dissection below the level of Axillary vein. meticulous surgical steps and minimizing the use of electrocautery. Suction drain can be removed when the amount is less than 30–50 ml/24 h. Antibiotic Prophylaxis should be given during the duration of drainage. immobilization of shoulder should be avoided, and active physiotherapy should be delayed for a period. Acute seroma can be expectantly managed unless causing pain or a tension on the wound. Infected seroma should be drained. Combination between mechanical closure technique and Tetracycline instillaion is recommended for reducing seroma formation after MRM. More researches are needed to reach the most beneficial procedure in this concept.

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