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Comparison of total seromas between Modified Radical Mastectomy (MRM) with and without skin flap fixation at Dr H. Adam Malik Hospital, Medan Indonesia



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ABSTRACT

Introduction: Breast cancer is second cancer in the world and in women, it estimated with 1.67 million new cases of breast cancer in 2012. Breast cancer is often found in the developing and underdeveloped country. Modified Radical Mastectomy (MRM) is one of modality therapy in breast cancer. Seromas is the most often MRM postoperative complications in breast cancer. The ideal skin flap fixation will minimize the discharge of seromas.

Method: This research is an experimental research conducted in H. Adam Malik Hospital for one year. The samples were all female patients with breast cancer who went to H. Adam Malik Hospital performed MRM with and without skin flap fixation that meets the inclusion and

exclusion criteria. The number of samples was 78 research subjects. The independent Variable is skin flap fixation, and the dependent variable is the production of seroma. Patient characteristic data will be presented descriptively and statistically analyzed using bivariate pairs with the corresponding test.

Result: The number of seromas using skin flap fixation is 212.82, and without a skin flap fixation is 357.66 with a value of $p = 0.003$ ($p < 0.05$).

Conclusion: There is a significant difference between the number of seromas in patients who performed modified radical mastectomy (MRM) with and without skin flap fixation.

Keywords: MRM, flap fixation, seroma

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INTRODUCTION

Breast cancer is second cancer in the world and in women, it estimated with 1.67 million new cases of breast cancer in 2012 (25% of total cancer). Breast cancer is often found in the developing and underdeveloped country. Breast cancer was found a little more in the underdeveloped regions as many as 883 000 cases and 794 000 cases in the developing region. Incidence rates varied across the world with 27 per 100,000 in Central Africa and East Asia, it up to 96 per 100,000 in Western Europe.¹

Breast cancer is cancer that most often occurs in Indonesian women. The incidence of breast cancer in Indonesia in 2012 amounted to 48 998 persons (30.5%) of the total 160 833 people affected by cancer. The mortality rate was 19750 people or 21.5% of total mortality caused by cancer (92821 people). The prevalence of breast cancer in Indonesia for 5 years is 171 005 (41.7%).¹ Division of Surgical Oncology at the H. Adam Malik Hospital recorded that the number of cases of breast malignancy in the period of 2009-2011 was as many as 1427 cases.

Surgery is the primary modality for the treatment of breast cancer. This modality provides a locoregional control which can be proved by histopathological examination and from the

surgery specimen can be determined type and grading of the tumor, axillary lymph node status, predictive and prognostic factors of the tumor (all of the above factors cannot be obtained from the other modalities). Various types of surgery for breast cancer such as Classic Radical Mastectomy (CRM), Modified Radical Mastectomy (MRM), Skin Sparing Mastectomy (SSM), Nipple Sparing Mastectomy (NSP) and Breast conserving treatment (BCT). MRM is surgical removal of the entire breast tissue along with the tumor, nipple areola complex, the skin over the tumor, the pectoral fascia and level I-II axillary dissection. This operation is carried out at an early stage of breast cancer and locally advanced.²

Seroma is the most often postoperative mastectomy complications in breast cancer with an incidence varies 15-81%. The research result in Iran showed an incidence of 35%, whereas in Poland based on Stanczyk report's that the formation of seroma occurs up to 50% after a mastectomy. Based on a meta-analysis conducted by Kuroi, that many of factors can influence the incidence of postoperative seroma in breast cancer patient.³ Chintanami describes there were no contributions to Body Mass

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Index (BMI) and techniques of surgery that use an electrocautery with the formation of seroma.⁴ Research conducted by Junior from the Division of Surgical Oncology at the Hospital Dr. Hasan Sadikin (RSHS) Bandung, the incidence data of seroma after modified radical mastectomy surgeries up to 62.5%.⁵

The ideal skin flap fixation will minimize the discharge of lymph fluid and the leakage of serum, provide restraining of the skin flaps securely to the structure of chest wall, eliminate the dead space, and allows the secretion of discharge more quickly. Some skin flap fixation techniques or wound drainage, as well as the restriction of shoulder motion after surgery and the use of glue, has been investigated to improve the primary healing and minimizes the formation of seroma.⁶

METHODE

This research is an experimental research conducted at H. Adam Malik Hospital in August 2015 until August 2016. The samples studied were all women with breast cancer who went to H. Adam Malik Hospital in Medan performed modified radical mastectomy (MRM) with and without skin flap fixation that meets the inclusion and exclusion criteria. Inclusion criteria were all female patients with breast cancer that proved histopathological performed modified radical mastectomy (MRM) with and without skin flap fixation, willing to participate in the study after being given informed consent. Excluded were patients who have impaired blood clotting or immune system, patients who underwent modified radical mastectomy with a skin graft, patients receive anticoagulant treatment, patients who had previously undergone surgery on the lymphatic system axillary or reconstructive surgery, patients with lymph node N3. MRM with Skin flap fixation is MRM surgery coupled with flap fixation to wound base using non-absorbable thread sutures of 3/0 size, with vertical mat suture technique, needle extracted from cuticle to subcutis and took the muscle underneath and then the needle is re-released from Subcutis to the cut and conclude from the outside so that the skin flap fixed to the chest wall (region infraclavicular, mammary fold and axilla) (figure 1).

78 research subjects included in the study, divided into two groups, patients who underwent modified radical mastectomy (MRM) technique fixation flap of skin and without fixation of skin flap as much as 39 patients each, then calculated the number of seroma for 5 days postoperatively. The characteristics Data of the patients presented descriptively with a frequency distribution table.

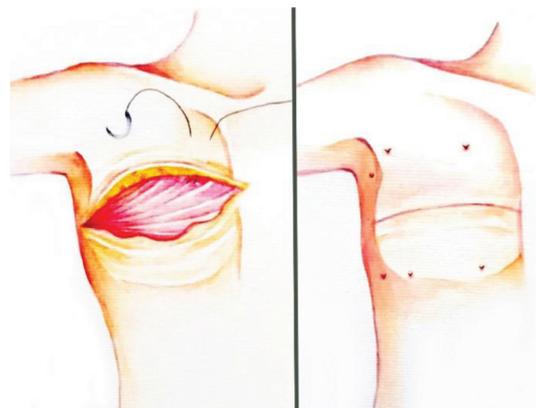


Figure 1 MRM with Skin Flap Fixation

Then data were processed and statistically analyzed using bivariate pairs with the corresponding test.

RESULT

Based on Table 1 it can be seen that the mean age of the study subjects who performed MRM with skin flap fixation was 47.33 ± 9.47 and the patients who performed MRM without skin flap fixation were 45.34 ± 8.53 . The majority of the patients who performed MRM with or without fixation flap of skin in this study are patients with grade histopathological II (21 and 22 subjects), the status of T4 (29 subjects each), the status of N1 (21 and 25 subjects), chemotherapy neoadjuvant 3 times (26 and 27 subjects). Based on axillary dissection technique most used in patients who done MRM with or without skin flap fixation is the dissection technique using cautery (33 subjects each). Most subjects who done MRM with skin flap fixation is non-obese patients (36 subjects), whereas without skin flap fixation is obese patients (27 subjects).

In Table 1 the p-value is obtained by using chi-square analysis to show the relationship between risk factors and skin flap fixation inpatient performed MRM. Only obese who have a relationship to the skin flap fixation in patients who performed MRM with $p = 0.001$ ($p < 0.05$).

Bivariate analysis between the amount of seroma and skin flap fixation

Research results in Table 2 shows the value of $p = 0.021$ ($p < 0.05$). This means that there is a significant difference between the number of seroma and skin flap fixation in patients with breast cancer who performed Modified radical mastectomy (MRM).

Bivariate analysis between the amount of seroma Based Research Subject Characteristics

Table 3 explains that the most number of seroma found at IDC types of histopathological in patients who have performed MRM without skin flap fixation, with an average of 363.22 ml seroma. While the fewest of seroma, was found in mix types

of histopathological in patients who performed MRM, with skin flap fixation (210 ml). Based on the analysis of T-test, p-value of the three types of histopathology showed $p < 0.05$. This suggests a difference between the seroma formation with and without skin flap fixation based on each type of histopathology.

By the histopathologic grade, the most number of seroma found at histopathologic grade II in patients performed MRM without skin flap fixation (376.73 ml). While the fewest number seroma was in histopathologic Grade I performed a skin flap fixation (174 ml). Based on the analysis of T-test, p-value of the histopathologic grade showed $p < 0.05$. This suggests a difference between the seroma formation

Table 2 The amount of seroma based on skin flap fixation

Research Subject	The Amount of Seroma		p
	With Skin Flap Fixation (ml)	Without Skin Flap Fixation (ml)	
1	130	620	0,021
2	180	330	
3	405	410	
4	205	380	
5	290	274	
6	165	510	
7	185	190	
8	200	320	
9	225	340	
10	150	290	
11	260	280	
12	220	340	
13	165	320	
14	210	310	
15	240	525	
16	240	360	
17	160	320	
18	240	270	
19	120	480	
20	125	225	
21	375	210	
22	125	280	
23	220	210	
24	260	640	
25	210	100	
26	250	510	
27	190	660	
28	160	480	
29	200	430	
30	165	280	
31	165	480	
32	265	360	
33	310	260	
34	180	390	
35	230	300	
36	250	320	
37	245	295	
38	175	160	
39	210	490	
Mean	212,82	357,66	

Table 1 Characteristics of Research Subject

Characteristics	Research subject		p*
	With skin flap fixation (n=39)	Without skin flap fixation (n=39)	
Age	47.33 ± 9.47	45.34±8.53	0,874
Histopathologic			0,335
IDC	33	35	
ILC	5	3	
MIX	1	1	
Histopathologic Grade			0,246
Grade I	12	5	
Grade II	21	26	
Grade III	6	8	
T Status			0,442
T1	0	0	
T2	4	3	
T3	6	7	
T4	29	29	
N Status			0,271
N0	10	9	
N1	21	25	
N2	8	5	
Neoadjuvant chemotherapy (NAC)			0,314
NAC 3 times	26	27	
Not yet chemotherapy	13	12	
Axillary Dissection Technique			0,629
Scissor	6	6	
Cautery	33	33	
Obesity			0,001
Obesity ()	3	27	
Obesity ()	36	12	

*Chi-Square Test

with and without skin flap fixation based on histopathologic grade (Table 3).

By the T status, the most number of seroma found at the T2 status in patients performed MRM without skin flap fixation (489,17 ml). While the fewest number seroma was in T3 status performed a skin flap fixation (183,75 ml). Based on the analysis of T-test, p-value of the three T status showed $p < 0.05$. This suggests a difference between the seroma formation with and without skin flap fixation based on the T status (Table 3).

By the N status, the most number of seroma found at the N2 status in patients performed MRM without skin flap fixation (560 ml). While the fewest number seroma was in N1 status performed a skin flap fixation (189,50 ml). Based on the analysis of T-test, p-value of the three N status showed $p < 0.05$.

This suggests a difference between the seroma formation with and without skin flap fixation based on the N status (Table 3).

By the status of chemotherapy, the most number of seroma found in patients has not been undergoing chemotherapy who performed MRM without skin flap fixation (412,92 ml). While the fewest number seroma was in patients has not been undergoing chemotherapy who performed MRM with skin flap fixation (191,15 ml). Based on the analysis of T-test, a p-value of the status of chemotherapy showed $p < 0.05$. It showed a difference between the seroma formation with and without skin flap fixation based on the status of chemotherapy (Table 3).

By the axillary dissection technique of mastectomy, the most number of seroma found in patients who performed axillary dissection technique of MRM using scissors without skin flap fixation (436,67 ml). While the fewest number seroma was in performed axillary dissection technique of MRM using cautery with skin flap fixation (207,88 ml). Based on the analysis of T-test, p-value of the axillary dissection technique of mastectomy showed $p < 0.05$. It showed a difference between the seroma formation with and without skin flap fixation based on the axillary dissection technique of mastectomy (Table 3).

By the obesity status, the most number of seroma found in obesity patients who performed MRM without skin flap fixation (385,85 ml). While the fewest number seroma was in not obesity patients, who performed MRM with skin flap fixation (212,64 ml). Based on the analysis of T-test, p-value of the obesity status showed $p < 0.05$. It showed a difference between the seroma formation with and without skin flap fixation based on obesity status (Table 3).

DISCUSSION

In this research involving breast cancer patients who performed modified radical mastectomy (MRM) with and without skin flap fixation techniques (39 subjects each) from the Division of Surgical Oncology of Department of Surgery of H. Adam Malik Hospital in Medan

The mean age of the study subjects who performed MRM with skin flap fixation was $47.33 + 9:47$ and the patients who performed of MRM without skin flap fixation were $45.34 + 8:53$. According Sakkary mean age of the study subjects in accordance with the theory that breast cancer is rare in women under 20 years and the highest rate found in the age of 45-66 years.⁶

Table 1 shows all of the parameters that were examined. There was no difference except for the

Table 3 The Amount of Seroma Based on Characteristics of Research Subject

Characteristic	The Amount of Seroma		p*
	With skin flap fixation (ml)	With skin flap fixation (ml)	
Histopathologic			
IDC	213.12	363.22	0.028
ILC	221.00	300.00	0.032
MIX	210.00	248	n/a
Histopathologic Grade			
Grade I	174.00	352.50	0,006
Grade II	223.81	376.73	0.002
Grade III	213.75	284.80	0.039
T Status			
T2	190.83	489.17	0.002
T3	183.75	360.00	0.038
T4	221.38	336.69	0.042
N Status			
N0	220.24	319.56	0.009
N1	189.50	396.67	0,006
N2	221.43	560.00	0,001
Neoadjuvant chemotherapy (NAC)			
NAC	223.65	336.44	0,03
Not yet chemotherapy	191.15	412.92	0,018
Axillary Dissection Technique			
Scissor	240.00	436.67	0,034
Cautery	207.88	346.03	0,027
Obesity			
Obesity ()	215.00	385.85	0,003
Obesity ()	212.64	345.00	0.013

*T-Test

percentage of the obese group, whereas in the obese group who performed MRM without skin flap fixation is 9 times more than who performed MRM with skin flap fixation. In contrast to the not obese group who performed MRM with skin flap fixation only 3 times more than who performed MRM without skin flap fixation.

Research results in Table 2 shows the value of $p = 0.021$ ($p < 0.05$). This means that the significant difference between the number of production of seroma in breast cancer patients who do modified radical mastectomy (MRM) with a skin flap fixation compared MRM without skin flap fixation. This is consistent with the research conducted by Hashemi stated that there is a difference between the formation of seroma in patients who performed mastectomy and skin flap fixation with $p = 0.001$ ($p < 0.05$).⁷ In line with the Bastelaar's research also mention that there is a difference between the formation of seroma in patients mastectomy and skin flap fixation with $p = 0.002$ ($p < 0.05$).⁸ Theoretically found that flap fixation can reduce the dead space in the modified radical mastectomy (MRM), so seroma formed into little. In line with the research of Bastelaar, also mention that there is a difference between the formation of seroma in mastectomy patients and skin flap fixation with $p = 0.002$ ($p < 0.05$).⁸ In the study conducted by anjani in Gajra Raja Medical College, found that there is a difference between the formation of seroma and flap fixation in patients performed MRM, with $p < 0.001$. Theoretically found that flap fixation can reduce the dead space in the modified radical mastectomy (MRM), so few of seroma formed.⁷

In the Kuroi's research conducted meta-analysis concluded that the skin flap fixation could reduce the formation of seroma.³ In Sakary's study mentions that in the comparison between the amount of seroma with and without skin flap fixation found that the amount of seroma with skin flap fixation fewer than without skin flap fixation ($p = 0.028$). Thus, concluded that the use of skin flap fixation could reduce the formation of seroma.⁶

Seroma often defined as a serous fluid that occurs after surgery were gathered under the skin flap and fill the dead space. After a mastectomy, seroma immediately gathered under the skin flap and dead space in the axillary regions. Seroma normally is absorbed within a few weeks. If great of seroma fluid formed, then the scar will be stretched that can cause patient discomfort. In some patients, accumulation of fluid will give some problems such as prolong of the treatment period and will increase the cost. it will also be aspirated repeatedly so that the patient will feel very uncomfortable.⁹

Released of the Inflammatory mediators will be followed by an increase in capillary permeability in

the area around the surgical wound. it will cause extravasation of the plasma; then it will be formed of seroma. The levels of immunoglobulin G (IgG), leukocyte cells and granulocytes were higher in patients with seroma. Inflammatory mediators such as proteinase, proteinase inhibitors, and cytokines are also found in seroma fluid.⁹

Research by Szeeci, indicates that the seroma fluid is an exudate, as evidenced by the discovered high level of IL-6 and IL-8 components in seroma fluid. This suggests that the formation of seroma occur due to an acute reaction to the inflammatory process during the first phase of wound healing process.⁹ On the basis of the inflammatory process, the conditions that can inhibit or reduce the severity of the inflammatory process will be able to reduce the occurrence of seroma. Special attention was focused to the greatest potential obliteration of dead space so that fixation is mainly carried out in the region of the infraclavicular, mammary and axillary fold. Closed suction drains are used. So seroma is reduced.⁶

In Table 3, risk factors that affect the existence of seroma in MRM with and without skin flap fixation such as the type of histopathology, grade histopathology, the size of the primary tumor (T), lymph node involvement (N), chemotherapy neoadjuvant, axillary dissection technique of mastectomy and obesity. Found that there are significant differences between the number of seroma in patients who performed MRM with skin flap fixation. Based on the literature, there is no evidence of similar research regarding the formation of seroma in breast cancer patients who performed MRM with and without skin flap based on the characteristics of each risk factors.

Based on the percentage of seroma, the amount of seroma in non-obese patients without skin flap fixation has a number of seroma much more than with skin flap fixation (160%). While the number of seroma in obese patients without the skin flap fixation has a number of seroma 170% more than with skin flap fixation. The differences in the number of seroma in obese patients are only slightly larger than non-obese patients. Thus, the alleged weaknesses in the proportion of obese patients much more than non-obese patients do not affect the final outcome of the number of seroma studied.

CONCLUSION

There is a significant difference between a number of seroma patients who underwent modified radical mastectomy with and without skin flap fixation, less production of seroma obtained at MRM with skin flap fixation. Skin flap fixation may be considered to be performed on all MRM surgery. Further studies

should be done with multivariate research methods to control the other risk factors to the number of seroma in patients performed MRM.

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