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The Comparison of Total Drain Volume in Post MRM Patient Using Songket Design and Tewart Design in Dr. Mohammad Hoesin General Hospital Palembang

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Abstract

Background: In 2018, breast cancer was the most common malignancies in women. Which main modality for the management is surgery. The most frequently-used incision design is Stewart incision. Its disadvantages were difficult to access axillary, surgical scar, lateral ear dog and the loss of anterior axillary fold. Another design used is Songket design which consists of crescent incision, rule of half buried mixed mattress suture technique and axillary anker suture. This study aims were to compare the total drain volume of post-MRM breast cancer patients between Songket and Stewart incision design.

Method: Clinical randomized control trial (cRCT) research is the most robust design for evaluating the interventions used. Samples were all post-Modified Radical Mastectomy Ca Mammae patients with Songket and Stewart incision design who were hospitalized in the Department of Surgery at Dr. Mohammad Hoesin Hospital Palembang in the time of June - November 2019. The inclusion criteria were Ca Mammae patients who underwent the procedure and agreed to participate for this study. The patients who had post-operative wound dehiscence,

under-documented drains, or the history of axillary lymph node surgery were excluded from this study.

Results: Total drain volume for post-MRM using Stewart incision was 613.85 ± 215.93 ml, while Songket Incision stood was 116.15 ± 139.95 ml. The mean age of the study subjects was 48.69 ± 9.57. BMI was 23.65 ± 3.51 on average. Total drain volume of Stewart incision design was 497.7 ± 75.98 higher than Songket incision design.

Conclusion: There was found significant difference in total drain volume between the two groups with p value of <0.001.

Keyword: ca mammae, modified radical mastectomy, stewart incision, songket incision

1. Introduction

In 2018, breast cancer became the most common malignancy in women according to WHO there were 2.088 million cases (11.6% in the world). The incidence rate was 46.3 cases per 100.000 women and 13.0 deaths per 100.000 women throughout the world. The total of breast cancer cases in Asia was 911.014 with a mortality rate of 310.577 cases.[1]

Globocan in 2018 found that breast cancer is the most common cancer in Indonesia with 58.256 million new cases (30.9% of all malignancies), and the incidence rate was 42.1 and 17 deaths per 100.000 population. It was followed by cervical cancer with incidence rate 23.4 per 100.000 population, and 13.9 deaths per 100.000 population. From this data, it can be seen that cancer deaths are quite high compared to the incidence rate.[2]

Surgery is the main modality for the management of breast cancer. Surgery provides locoregional control that can be proven by histopathological examination. The specimen can give us information for the type and grading of tumor, axillary lymph node status and prognostic factors of the tumor. There are 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 the surgical

technique remove the whole breast tissue altogether with the tumor, nipple areola complex, skin over the tumor, pectoral mayor fascia and axillary lymph node level I-II. This operation is used for early stage and local advance breast cancer.[3] The total number of MRM procedures in Mohammad Hoesin Hospital Palembang in 2018 were 135 patients.[4]

The incision design applied at Mohammad Hoesin Hospital is the Stewart incision. This design has the advantages of being convenient to be applied, yet the disadvantages are also found such as the difficulty of accessing axilla, leaving lateral scar surgery, and the loss of axillary fold. Another design could be reliable for this modality is Songket incision design. It consists of crescent incision with a buried mixed mattress suture technique, rule of half, axillary anker which has wider exposure and better post-operative scar. High negative suction drain is routinely performed to treat seroma in post-operative mastectomy. High negative suction drain is also an important factor that contributes to increasing hospitalization days where patients can be discharged if only the suction is released.[9]

This research was conducted to compare total amount of drain volume in Songket and Stewart incision design. This will be essential for determining how long the hospitalization of patients with Ca mammae post MRM take place.

2. Method

This research is a clinical randomized control trial (cRCT) research which used to show that the interventions used are really feasible. This research was conducted at Department of Surgery and Inpatient Units in the Dr. Mohammad Hoesin Palembang Hospital on June - November 2019. Samples were ca mammae in patients who were performed modified radical mastectomy surgery using Songket dan Stewart incision design and fitted to inclusion citeria. The inclusion criteria of this study was Ca Mammae patients that underwent MRM surgery in the Department of Surgery Dr. Mohammad Hoesin Hospital Palembang and had been informed consent to participate the study. Some criteria for excluding the patients from this study were those who come with the post-operative wound dehiscence, the history of axillary lymph node surgery or under-documented drains.

3. Results

This is a *clinical randomized control trial* (cRCT) study conducted at the Inpatient Units and Surgery Department of Dr. Mohammad Hoesin Palembang Hospital on June - November 2019. The population and samples were post Modified Radical Masectomy patients in the Department of Surgery, Dr. Mohammad Hoesin Palembang. It was obtained 13 research subjects of each group who fit the inclusion and exclusion criteria. Patient characteristics can be seen in table 1.

Tabel 1. Patient Characteristics

Research Variable	Mean ± SD	Median (Min – Max)	p_value
Age	48.69 ± 9.57	48.50 (33 – 64)	0.251
BMI	23.65 ± 3.51	23.00 (18 – 33)	0.089
Drain Volume	365 ± 310.13	400 (20 – 1150)	0.012
Treatment duration	4.88 ± 1.79	5.00 (3 – 8)	0.000
Tumor volume	730.96 ± 275.02	750.00 (150 – 1350)	0.974
Tumor Mass	691.08 ± 285.78	707.50 (95 – 1285)	0.981

Note: *Shapiro Wilk*, p<0.05 = distribution not normal

Age distribution

In the table 2, the age distribution was obtained based on the Stewart and Songket incision technique with an average age of 47.92 ± 9.54 years old and 49.46 ± 9.92 years old, with median of (min-max) 48.00 (35-64) years old and 49.00 (33-64) years old, p >0.05

Table 2. Age distribution

Research variables	Method		p_Value
	Stewart	Songket	
Mean ± SD	47.92 ± 9.54	49.46 ± 9.92	
Median	48.00	49.00	0.691
Min – Max	35 – 64	33 – 64	

Note: *Independent t-test*

BMI distribution

Table 3. shows BMI distribution based on Stewart's and Songket technique with mean BMI of 23.80 ± 4.10 kg/m^2 and 23.49 ± 2.98 kg/m^2 with median of (min-max) 22.80 (19-33) and 23.20 (18- 31), p > 0.05

Table 3. BMI distribution

Research Variables	Method		p_Value
	Stewart	Songket	
BMI			0.828
Mean ± SD	23.80 ± 4.10	23.49 ± 2.98	
Median	22.80	23.20	
Min – Max	19 – 33	18 – 31	

Note: *Independent t-test*

Tumor Volume

Table 4. shows tumor volume distribution where Stewart incision technique with an average of 762.31 ± 234.31 ml compared to Songket of 699.62 ± 317.09 ml and median of (min-max) 780.00 (380-1250) ml and 700.00 (150 - 1350) ml sequentially, p > 0.05

Tabel 4. Tumor Volume Distribution

Research Variables	Method		p_Value
	Stewart	Songket	
			0.572
Mean ± SD	762.31 ± 234.31	699.62 ± 317.09	
Median	780.00	700.00	
Min – Max	380 – 1250	150 – 1350	

Note : *Independent t-test*

Tumor Mass

Table 5. exposes tumor mass distribution having mean of 719.92 ± 234.16 gram and 662.23 ± 336.91 gram for Stewart and Songket incision design sequentially. The median (min-max) are 740.00 (305 - 1180) gram and 691.00 (95 - 1285) gram, p > 0.05

Tabel 5. Tumor Mass Distribution

Research Variables	Method		p_Value
	Stewart	Songket	
			0.617
Mean ± SD	719.92 ± 234.16	662.23 ± 336.91	
Median	740.00	691.00	
Min – Max	305 – 1180	95 – 1285	

Note: *Independent t-test*

Drain Volume

In table 6. obtained Drain Volume distribution based on Stewart and Songket incision technique with mean Drain Volume of 613.85 ± 215.93 ml and 116.15 ± 139.95 ml with median (min-max) 540.00 (360-1150) ml and 60.00 (20 - 510) ml, $p < 0.05$

Tabel 6. Drain volume distribution

Research Variables	Metode		p_Value
	Stewart	Songket	
			0.000
Mean ± SD	613.85 ± 215.93	116.15 ± 139.95	
Median	540.00	60.00	
Min – Max	360 – 1150	20 – 510	

Note: *Mann-Whitney*

Hospitalization

In table 7, the distribution of hospitalization time shows the average hospitalization time 6.23 ± 1.48 days for Stewart incision design and 3.54 ± 0.77 days for Songket incision design, with a median of (min-max) 5.00 (5-8) days and 3.00 (3 - 5) days, $p < 0.05$.

Tabel 7. Hospitalization stay distribution

Research Variables	Method		p_Value
	Stewart	Songket	
			0.000
Mean ± SD	6.23 ± 1.48	3.54 ± 0.77	
Median	5.00	3.00	
Min – Max	5 – 8	3 – 5	

Note: *Mann-Whitney*

4. Discussion

In 2018, breast cancer became one of the diseases with the most common malignancy in women recorded by WHO as many as 2.088 million cases (11.6% of all malignancies) with an incidence rate of 46.3 cases and 13.0 deaths per 100.000 women throughout the world. The number of breast cancer cases in Asia is 911.014 cases with a mortality rate of 310.577 cases.[1] Globocan in 2018 found that breast cancer was the most common cancer in Indonesia with 58.256 million new cases (30.9% of all malignancies) with an incidence rate of 42.1 with 17 deaths per 100.000 population. It is then followed by cervical cancer with an incidence rate of 23.4 with 13.9 deaths per 100.000 population.[2]

The distribution of BMI based on the Stewart incision technique with a mean BMI of 23.80 ± 4.10 kg/m^2 and Songket incision of 23.49 ± 2.98 kg/m^2 with a median (min-max) of 22.80 (19-33) kg/m^2 and 23.20 (18-31) kg/m^2. In the normality analysis test, it was found that BMI was normally distributed. Independent t-test analysis was performed and found that BMI did not obtain a significant difference between those two incision groups. In Mary's study, it is involved 7207 female patients with BMI of 15-100 who underwent unilateral mastectomy for breast cancer. Of those subjects, median BMI was 27.3 kg/m^2. Thirty-five percent (n = 2529) was normal weight and 29.7% (n = 2147) had BMI of 25-29.9. Thirty-four percent (n = 2531) of the patients were obese (BMI> 30 kg/m^2), of whom 1.390 (19.0%) were classified to Class I (BMI = 30-34.9 kg/m^2), 667 (19.0%) were for Class II (BMI = 35-39.9 kg / m^2), and 474 (6.5%) were for Class III Re(BMI> 40 kg/m^2). As the cohort study conducted, 453 patients (6.29%) resulted major complications while 173 patients (2.40%) had minor complications. Fifty-three (0.74%) had bleeding

complications, 148 (2.05%) surgical site infections (SSI), 352 (4.88%) Return to Operating Room (RTOR), and 7 (0.01%) died in 30 days. Major complications ($p = 0.005$), minor complications ($p < 0.001$), and SSI ($p < 0.001$) increased significantly with increasing BMI. Return to Operating Room was believed having a rising trend, but it was not statistically significant. The risk of bleeding seemed to increase along with those who had BMI of 30-34.9 kg/m^2.[6]

The distribution of tumor volume based on incision design with an average of 762.31 ± 234.31 ml and 699.62 ± 317.09 ml with a median (min-max) of 780.00 (380-1250) ml and 700.00 (150-1350) ml for Stewart and Songket incision design. The volume of the tumor was normally distributed according to the Normality test. Independent t-test analysis was performed and it was found that the tumor volume did not have a significant difference between the two incision groups.

Tumor mass distribution had an average age of 719.92 ± 234.16 gram for Stewart incision design and 662.23 ± 336.91 gram for Songket incision design with a median (min-max) of 740.00 (305-1180) gram and 691.00 (95-1285) gram consecutively. By the normality test, it was found that the tumor mass was normally distributed. Independent t-test analysis was performed and it showed that the tumor mass did not have a significant difference between the two incision groups.

The distribution of Drain Volume where Stewart incision technique came up with a mean of 613.85 ± 215.93 ml compared to Songket incision design which was 16.15 ± 139.95 ml. The median (min-max) were 540.00 (360-1150) ml and 60.00 (20 - 510) ml consecutively. By normality test, it was found that the total volume drain was not normally distributed. The Mann-Whitney analysis test was then performed and it showed significant difference for the total drain volume these two incision groups.

There would be several options for placing the drainage after MRM due to the large post-surgery free space. However, the drainage placement plays a great role. The placement in the gravitational gradient vector provides greater performance compared to the placement of two to three separate channels that oppose it. Therefore, the pectoro-axillary drainage system is the finest placement of all other vectors, even compared to the multiple drain placement. Meanwhile, the preference of using conventional or vacuum drainage channels does not affect significantly towards the drainage placement.[6-8]

In the Hirotaka study, the mean total drainage of the subjects was 557.3 ± 359.7 mL. A strong correlation was observed between total volume drainage and the duration of drainage (correlation coefficient of 0.908). Surgical factors, such as type of mastectomy, type of expander, time of operation, and blood loss, do not affect total drainage. Patients with axillary lymph node dissection showed higher total drainage volume (P <0.001). Variables of resected specimen weights, body weight, and breast volume which were conducted before surgery showed a strong correlation to the total drainage (with the correlation coefficients of 0.454, 0.388, and 0.345 respectively). Using the multiple regression analysis of preoperative data, the factors of age (P = 0.008), weight (P = 0.018), and scheduled axillary dissection (P <0.001) were proved significant for total drainage. Among the postoperative data, age (P = 0.003), axillary dissection (P = 0.032), and the weight of the resected specimen (P = 0.013) showed as the significant predictors.[6-8]

The distribution of hospitalization stay based on the Stewart incision technique with the average treatment duration of 6.23 ± 1.48 days compared to Songket incision design which was 3.54 ± 0.77 days with median (min-max) of 5.00 (5-8) days and 3.00 (3-5) days consecutively. Using Normality test, it was found that the hospitalization stay was not normally distributed. The Mann-Whitney analysis test was performed which then showed that there were significant differences in treatment duration between the two incision groups.

The ongoing consensus presumes that the performance of a single drainage system has the similar effect in most of aspects compared to the placement of multiple separate channels. Placing a single drain significantly reduces trauma and patients' discomfort, which comes along with the possible post-operative complications. It also makes it possible to leave the hospital earlier. [6-8]

Vacuum system drainage provides far better results towards the incidence of postoperative infections and the formation of hematomas. This fact allows hospital discharge could be done earlier. Comparing the high and low pressure of vacuum system drainage, the low negative pressure impact the lower incidence of seroma and surgical wound infections, which lessen the hospitalization stay.[6-8]

Wound closure following the classic and popular method which was not in conjunct with drainage has reported higher occurrence and greater volume of seroma that formed in the

postoperative period. However, fibrin-based tissue sealants and other types of surgical wound closure in some procedures have resulted the lower incidence of seroma compared to the other patients who are dried and untrained. Some views of the option not to use drain combined with tissue sealants or quapting flaps in MRM which reduce the hospitalization stay, had been expressed by several clinical trials confirming this encouraging statement in several respects. The less drainage discomfort and pain of the patients, as well as the lower risk of postoperative infections, had provided further commercial values for this type of procedure. This procedure generally allows hospital discharge early and limits the emotional traumatism to the patients.[6,8]

5. Conclusion

1. The total volume drain of post MRM Ca Mammae patients between Stewart and Songket incision design is 613.85 ± 215.93 mL and 116.15 ± 139.95 mL consecutively. There was found a difference in total volume drain among those two groups with p value <0.001.
2. Sociodemographically, the mean age of this study subjects was 48.69 ± 9.57 years old and the mean BMI was 23.65 ± 3.51 kg/m^2.
3. Comparison of the total volume drain of post MRM Ca Mammae patients between Stewart and Songket in this study was 497.7 ± 75.98 mL.

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