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Description of Seroma Production in Modified Radical Mastectomy with Skin Flaps Fixation Patients in H. Adam Malik Hospital, Medan, Indonesia

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ABSTRACT

The recent studies aimed to evaluate the effect of obliteration of dead space with suture fixation of the skin flaps in patients who underwent modified radical mastectomy with volume of seroma as the indicators. Factors that were evaluated including T status, N status, neoadjuvant chemotherapy, axillary dissection techniques and obesity. The result showed that the higher value of T, N, neoadjuvant chemotherapy, the use of scissors and obesity will increase the volume of seroma.

Keywords: Modified radical mastectomy, Breast carcinoma, Seroma, Skin flaps fixation

INTRODUCTION

Breast cancer is the second most common in women, and it was estimated approximately 167 million of new cases in breast cancer in 2012 (25% of total cancer). The breast cancer in Asia is escalating more rapidly than in the west, for instance, in Singapore the Age-Standardized Incidence Rate (ASR) of breast cancer had increased from 202 per 100,000/year between 1968 and 1972 to 549 per 100,000/year between 1998 and 2002 [1]. Breast cancer was also a common cancer in women in Indonesia. The incidence of breast cancer in Indonesia in 2012 amounted to 48,998 people (30.5%) of the total 160,833 people affected by cancer. The mortality rate 19,750 people or 21.5% of total mortality caused by cancer are 92,821 people. The prevalence of breast cancer in Indonesia for latest 5 years was 171,005 (41.7%) [2]. Although several non-invasive techniques have been developed for the treatment of cancers, surgery is the gold standard for most of life-threatening diseases. Surgery for operable breast cancer has evolved a long way since W. Halsted first described this malignancy [3]. The type of surgery depends on the stage of the breast cancer at the time and surgeon's choice. The different surgical treatment options available include simple mastectomy, modified radical mastectomy and breast conservation surgery. Among these procedures, modified radical mastectomy (MRM) is the most commonly performed procedures (in about 70% women) [4]. Seroma, an accumulation of fluid can infrequently occur after any surgical procedures and is the most prevalent postoperative sequel after breast surgery, with an incident of 10% to 85% leading to significant morbidity and discomfort and possibly delaying adjuvant therapy [5]. An ideal skin flaps fixation will minimize the intrusion of lymph fluid and serum leakage, provide a way of holding the skin flaps safely to the structure of the chest wall, obliterate the dead space and allows the intrusion more quickly that are formed. A number of fixation techniques of skin flaps or wound drainage necessary to be conducted, as well as restriction of shoulder movement of post-operative and the using of glue, have been studied to improve primary healing and to minimize the production of seroma [6]. The study was to evaluate the effect of obliteration of dead space with suture fixation of mastectomy skin flaps on chest wall so as to prevent the incidence of seroma formation.

MATERIAL AND METHODS

Samples and population

The population in this study were female patients with breast carcinoma that were treated in H. Adam Malik Hospital performed MRM.

The samples of the study were all female patients with breast carcinoma were treated in H. Adam Malik Hospital performed MRM with skin flaps fixation.

INCLUSION AND EXCLUSION CRITERIA

Inclusion criteria

The inclusion criteria including all the female patients with breast carcinoma that proved histopathologically and performed MRM with skin flaps fixation and willing to follow the study after being given the explanation.

Exclusion criteria

The exclusion criteria including:

1. Patients who have blood clotting disorders or immune system.
2. Patients who is receiving anticoagulant treatment.
3. Patients who have psychological disorders.
4. Patients who underwent surgery earlier in the axillary lymphatic system or reconstructive surgery.
5. Patients of MRM with skin graft.
6. Patients with lymph node N3.

Number of samples

The number of samples was determined using formula:

$$n = \frac{z\alpha \times PQ}{d^2}$$

$$n = (1.96)^2 \times 0.63 \times 0.37 / (0.15)^2$$

$$n = 3.84 \times 0.23 / 0.0225$$

$$n = 39$$

Description

n=Number of samples;

Z α =Maturity level (1.96 CI 95%);

P=Proportion of previous research (0.63);

Q=1-P;

d=Desirable of absolute level of accuracy (15%).

Variables

Identified variables are production of seroma. Other variables were histopathology, tumor grade, neoadjuvant chemotherapy, axillary dissection techniques, obesity (BMI).

Modified radical mastectomy techniques and skin flaps fixation

1. Patients in the supine position of general anesthesia, aseptic antiseptics.
2. Incision cutis subcutis, creation of flaps until infraclavicular superior, medial to parasternal, inferior and lateral to mammary fold until the latissimus dorsi muscle with 0.5 cm thickness.
3. Mastectomy was performed by lifting the nipple areola complex, the tumor mass in breast tissue, the skin over the tumor, fascia pectoralis major and pectoralis minor.
4. Do axillary lymph node dissection level I and II to preserve the N. thoracicus longus, N. intercostobrachialis, N. thoracodorsalis, artery and axillary vein.
5. Control the bleeding, surgical wound was washed with 2000 mL distilled water.
6. Do the flaps fixation with surgical wound in the axilla region, infraclavicular, and mammary fold with non absorbable thread 3/0.
7. Do the installation of 2 pieces of vacuum drain under the subcutis flap and axilla.
8. Surgical wound closed with subcuticular technique with absorbable thread 3/0.

RESULT AND DISCUSSION

Subject characteristics

Characteristic of subjects are described in the following Table 1.

Table 1: Characteristic of subject based on age

Characteristic	N	Maximum	Minimum
Age (mean ± SD)	47.33 ± 9.47	65	34

Based on the table above it can be seen that the mean age of the subject was 47.33 ± 9.47 , consisting of 65 years old as the oldest and 34 years old as the youngest. The same result was reported by Laamiri *et al.* [7]. In their study, Laamiri *et al.* reported that the breast cancer was most common in the age ranging from 22-34 years old for young age and over 45 years old for the older age. Oral contraceptive and family history with the first degree were positively associated with breast cancer in all the series and in the age group between 22 and 34 years old. In the age group between 44 and 34 years old, a risk of breast cancer was associated only with family history of breast cancer, and in the 45 years old or older, the factors which seem to influence a breast cancer are late menopause, oral contraceptive and family history in first degree.

The volume of seroma based on T status

The volume of seroma based on T status was described in Figure 1.

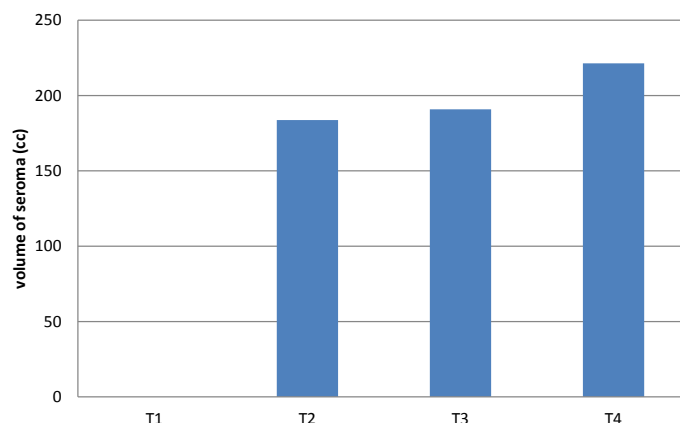


Figure 1: Amount of seroma based on T status

Based on Figure 1, the most amount of average of seroma was breast carcinoma with T4 namely with the average volume of seroma 221,38 cc. while the least number of seroma was breast carcinoma with T2, with average volume 183,75 cc. It is showed that the higher value of T, the volume of post-operative seroma MRM will be more and more. This is according to research conducted by Sakkary *et al.* [6] i.e., the greater the volume of tumors that removed, the more the amount of seroma produced, although the result was not statistically significant.

The volume of seroma based on N Status

The volume of seroma based on N status was described in Figure 2.

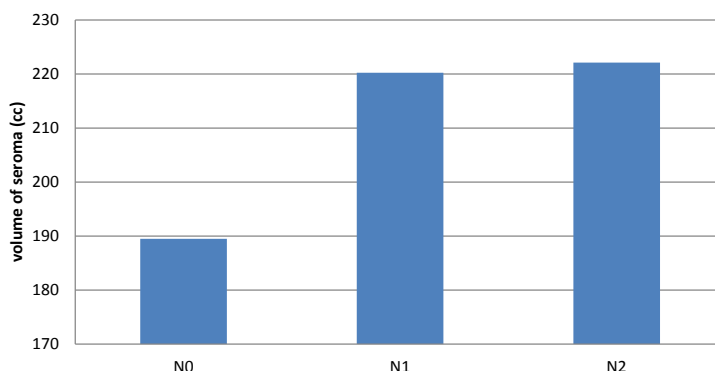


Figure 2: Volume of seroma based on N status

Figure 2 explained that the highest average of seroma is breast carcinoma with N2 i.e., with volume of seroma 222 ± 90.63 cc. while the fewest volume of seroma is breast carcinoma with N0 i.e., 189 ± 46.63 . This shows the higher the value of N, the seroma after MRM will be more and more. The increase in spreading of lymph nodes in breast carcinoma will lead to an increase in the number of lymph nodes around the breast, both in axillary, infra and supra clavicular. When MRM was conducted, the number of dissected lymph nodes will be more numerous, and the fluids that come out lymph nodes also will be more [8].

The volume of seroma based on the number of neoadjuvant chemotherapy

Figure 3 described effect of neoadjuvant chemotherapy treatment on volume of seroma.

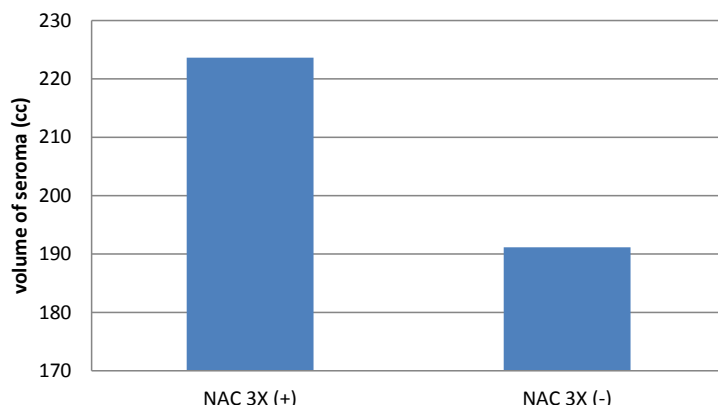


Figure 3: Volume of seroma based on number of neoadjuvant chemotherapy

Figure 3 explained that the highest average of volume of seroma is in breast carcinoma who had neoadjuvant chemotherapy as many as 3 times, with an average volume of 223.65 ± 67.50 , compared to the subject who did not underwent the chemotherapy with an average volume of seroma 191.15 ± 44.86 cc. Sampathraju and Rodrigues [9] reported that neoadjuvant chemotherapy led to fragility of the lymph node. The lymph flow in breast carcinoma will easily rupture at the time of MRM. This allows the greater formation in seroma than subject without neoadjuvant chemotherapy.

Volume of seroma based on axillary dissection technique

The effect of dissection technique on seroma volume described in Figure 4.

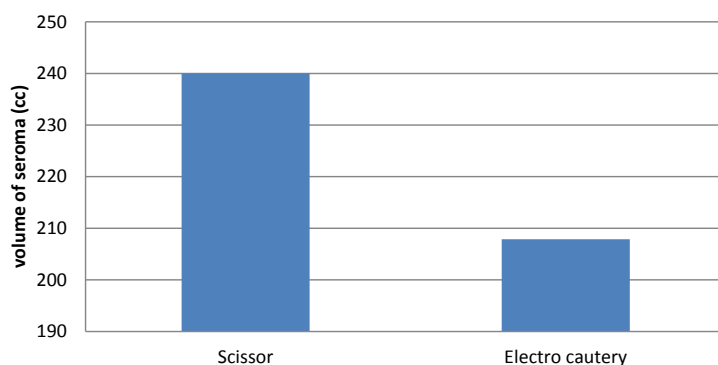


Figure 4: Volume of seroma based on dissection technique

Figure 4 described that the volume of seroma in MRM surgery with axillary dissection technique using scissors were 240.00 cc compared with MRM surgery with electro cautery dissection techniques, as much as 207.88 cc. This indicates that MRM surgery with axillary dissection technique using electro cautery is better than using scissors. According to the study conducted by Hashemi et al. [10], that there was a correlation between the use of scissors with the formation of seroma ($p=0.06$). Dissection using scissors will cause more seroma, because the lymphatic gland and blood vessels were truncated without hemostasis.

Volume of seroma based on obesity

The effect of obesity on seroma volume described in Figure 5.

Figure 5 explained that the breast carcinoma with obesity has more volume (215 cc) than non-obesity. Zielinski et al. [11] reported that age, BMI and history of prior neoadjuvant chemotherapy have an influence on seroma formation and may considered as seroma formation prognostic factors in patients undergoing MRM. Srivastava et al. [12] reported that in obese patients mammary volume will increase, along with hyperplasia and hypertrophy of fat gland. This will cause an increase of the flow of lymph nodes. The volume dissected breast will be bigger compared to patients with normal BMI.

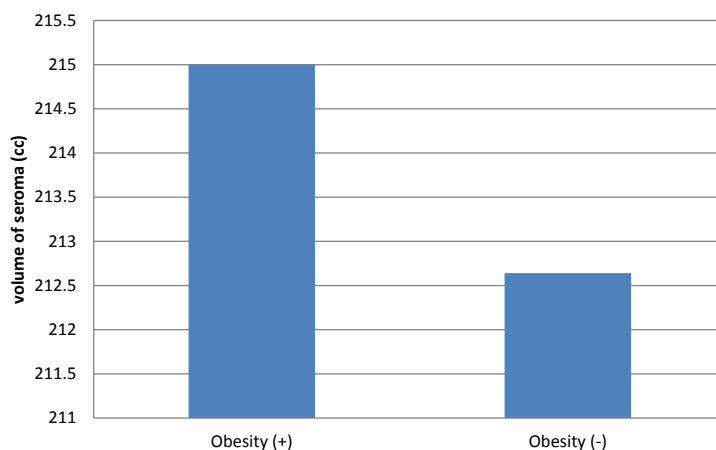


Figure 5: Effect of obesity on volume of seroma

CONCLUSION

Seroma is a postoperative complication mastectomy in breast cancer that most often found. One way to minimize the volume of seroma is by skin flaps fixation. Several factors that affects the formation of seroma in MRM with skin flaps fixation are the type and grade of histopathology T and N status, number of neoadjuvant chemotherapy, dissection technique and obesity.

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