



Original Article

Comparison between Scissors and Electrocautery in Seroma Formation Following Modified Radical Mastectomy (MRM)

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Abstract:

Background and Objective: Seroma is encountered as the commonest complication after mastectomy. Though various factors are suspected in causation of seroma, in this prospective study we tried to evaluate role of two different surgical technique of MRM in causation of seroma formation.

Materials and Methods: In this observational comparative study, a total 90 patient of early breast carcinoma who had undergone Modified Radical Mastectomy (MRM) in 3 tertiary care hospitals of Dhaka were divided into 2 groups. In Group A, we used electrocautery for raising the skin flap and axillary dissection while in Group B we used curved Metzenbaum scissors to raise the skin flap along with aid of suture ligation for axillary dissection. Incidence of seroma formation was compared in both the groups.

Results: Incidence of seroma was significantly higher with use of electrocautery. Results in both the groups were compared by Chi-square method, and statistically significant difference in incidence of seroma formation was found between two groups.

Conclusion: Breast surgery, as MRM does not support injudicious use of electrocautery.

Keywords: Mastectomy, Electrocautery, Tissue damage, Seroma

Introduction:

Seroma is a collection of sterile serous fluid in the dead space of post-mastectomy skin flap and axilla following breast and axillary surgery, and it is the commonest early complication that is seen^{1,2} with an incidence of 3 to 85 % reported from various studies³. Though some surgeons merely view it as a side effect and nuisance, seroma following mastectomy can lead to significant morbidity and more importantly at times delay in the initiation of adjuvant therapy⁴.

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Exact risk factors for its formation have still not been identified, but extent of surgery and technique of surgery are most important in its development. In order to prevent seroma, various techniques and their modifications have been practised and published, but there is little consensus as of yet. It is believed that meticulous attention to technique of breast surgery to minimize the leakage from dissected blood vessels and lymphatics may reduce the incidence of seroma formation⁵. Use of electrocautery because of its charring effect on tissue during breast surgery has been reported as one of the causative factors in seroma formation⁶. The aim of our study was to identify any significant association between use of electrocautery and seroma formation during Modified Radical Mastectomy (MRM).

Materials and Methods:

This observational comparative study was conducted between the year 2017 and 2019 in the Department of Surgery of 3 tertiary care hospitals of Dhaka; Dhaka

Medical College Hospital, Dhaka Central International Medical College Hospital and Green Life Medical College Hospital. 88 patients of early breast cancer (Stage I/II Breast cancer) who had undergone Modified Radical Mastectomy (MRM) were selected for the study. Inclusion criteria were a) Female patient, b) Early breast cancer (Stage I/II Breast Carcinoma) c) Undergone Modified Radical Mastectomy (MRM), d) Aged above 18 years. Exclusion criteria of a) Locally advanced breast cancer (stages III and IV), b) Body mass index (BMI) greater than 30 kg/m² and less than 18.5 kg/m², c) Diabetes mellitus, d) Uncontrolled hypertension (systolic BP > 150 or diastolic BP >100), e) Patients having received neoadjuvant treatment. MRM was a uniform initial treatment for all patients. After giving single a single dose of IV antibiotic (1 gm Ceftriaxone) at the time of induction of anesthesia, all patients were operated under general anesthesia. Informed consent was obtained from each patient. A total of 90 patients were included in this study and divided into two groups. In group A (sample size 55), during MRM, coagulating mode electrocautery was used to raise the skin flap and for axillary dissection. In Group B (sample size - 35,), during MRM, curved Metzenbaum scissors were used to raise the skin flap, along with the aid of suture ligation for axillary dissection wherever necessary. Further in group B, there was an extremely minimal use of bipolar electrocautery wherever found necessary to achieve hemostasis. Both the groups underwent standard Modified Radical Mastectomy with lymph node dissection of level I, II, and III. Closed suction drain with negative pressure (number 16) was kept in both the groups, with one tube along the lower skin flap and another tube in the axilla. Skin closure was done with nonabsorbable monofilament. On histopathological report, adequate lymph node dissection (a minimum number of 10 axillary nodes) was ensured in both the groups. In the postoperative period, drain quantity was monitored and noted every 24 h for both the groups. Postoperatively our criteria

for drain removal was when drain quantity in the last 24 hours had fallen to less than 30 ml. Development of seroma as a complication was defined when drain quantity continued to be more than 40 ml after 7th post-operative day or if there was clinical evidence of fluid collection beneath the skin flap during follow up of patients after discharge from hospital. After removal of drain, we monitored the patients for the next 12 weeks; skin flaps were examined regularly to look for any fluid collection noticing fluctuation, and seroma was confirmed with aspiration of fluid. Chi-square test was applied for comparison of seroma formation between both the groups. The level of significance was set at p value <0.05.

Result and Analysis:

Group A comprised of 55 females with a mean age of 53 years, and group B comprised of 35 females with mean age of 52 years. There were no significant differences between the two groups with respect to age, BMI, tumor size, nodal yield (both groups underwent level I, II, and III nodal clearance) and nodal involvement. The number of patients who developed seroma in groups A and B has been illustrated in Table 1. Duration of surgery was longer in group B (mean duration for groups A and B was, 70 and 95 min, respectively). Drain was removed after a mean duration of 8 days in group A and 4 days in group B.

Comparison of seroma formation in both the groups in the form of percentage of patients in either group is shown in Fig. 1.

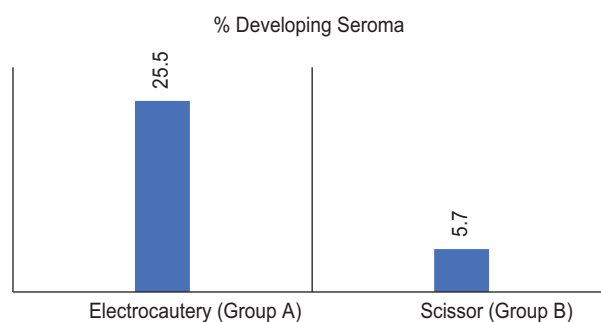


Fig. 1 Percentage of patients developing seroma

Table 1. Comparison of seroma formation in two groups

Group	Dissection technique (Total number of patients)	Number of patients who developed seroma	Number of patients who did not develop seroma	P Value
Group A	Electrocautery (55)	14	41	0.022
Group B	Scissors (35)	2	32	

Discussion:

Post-mastectomy seroma is often perceived as a side effect of breast surgery rather than a complication. Even so, it can lead to significant morbidity after the procedure. It continues to be an unresolved problem as the risk factors for its causation have still not been found. However, extent and technique of procedure are often considered as responsible factors for its development. Though the precise pathogenesis of seroma has not been fully elucidated, it is believed that seroma forms due to acute inflammatory exudates in response to surgical trauma in an acute phase of wound healing⁷. As lymphatic drainage of breast is rich which drains through intramammary lymphatics to the axillary, supraclavicular and internal mammary nodal basins, there is a tendency for seroma formation after breast surgery. During breast surgery, damage to small blood vessels and lymphatics cause leakage of fluid which presents as seroma⁸. It has been proposed that the low fibrinogen levels and net fibrinolytic activity within lymphatic fluid collections aggravates seroma formation^{7,9}. Collection of seroma raises the flaps from the chest wall and axilla thereby preventing their adherence to the tissue bed. It thus can lead to significant morbidity such as wound hematoma, delayed wound healing, wound infection, wound dehiscence, prolonged hospitalization, delayed recovery as well as initiation of adjuvant therapy and cosmetically poor skin flap^{7,8}. Investigating factors in seroma development might help in its prevention. There seems to be an evidence against the use of electrocautery in breast surgery, as electrocautery produces significant thermal trauma and inflammation after its charring effect on fat, blood and lymphatic vessels. So, it is believed that electrocautery leads to more seroma formation⁷. Two prospective clinical trials by K Porter et al. and Keogh G et al. randomly assigned patients who had breast cancer to undergo surgery either only with electrocautery or with scalpel/scissors. These studies have confirmed that there is lower incidence of seroma formation with dissection by scalpel blade or scissors compared to electrocautery^{6,10}. Our findings match with the above mentioned studies, as evident from Table I, results and analysis; seroma formation is less in group B.

Conclusion:

Electrocautery is significantly associated with seroma formation in breast surgery. Therefore, there should not be an injudicious use of electrocautery during

mastectomy for breast cancer. Routine use of electrocautery to raise the skin flap should be avoided, and its use should be restricted to achieve hemostasis whenever necessary. And if necessary bipolar diathermy should be the preferred over unipolar diathermy.

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