



“Scalpel Versus Electrocautery Dissection: A Comparative Study in Modified Radical Mastectomy”

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KEYWORDS

Modified Radical Mastectomy (MRM), Breast Cancer, Scalpel Dissection, Electrocautery Dissection.

ABSTRACT:

Background:

Breast cancer is one of the most common malignancies in women, with many undergoing modified radical mastectomy (MRM) as treatment. Although most procedures are uneventful, complications such as seroma remain common and can cause morbidity, prolonged hospital stay, and delay in adjuvant therapy. This study was conducted to compare the use of scalpel and electrocautery for raising the skin flap and performing axillary dissection in modified radical mastectomy.

Methodology: In this study 82 patients presented with carcinoma of breast and managed by MRM in our were included. Patients undergoing MRM divided into two groups, in one group we used electrocautery for raising the skin flap and axillary dissection while in another group we used scalpel to raise the skin flap along with scissors and suture ligation for axillary dissection. Incidence of seroma formation was compared in both the groups.

Results: In this study, 82 patients were enrolled with a median age of 52 years in Group A and 50 years in Group B, with comparable tumor sizes. Electrocautery significantly reduced operative time but was associated with higher seroma formation, delayed drain removal, and slightly longer hospital stay compared to scalpel dissection.

Conclusion: Electrocautery should be used judiciously in breast surgery. Preferably scalpel should be used to raise the skin flap.

Introduction:

Collection of sterile serous fluid in the dead space of operated area is called as seroma. Seroma formation is the commonest complication after mastectomy.¹ The management of seroma is usually done by frequent aspirations which may continue for months after surgery, or it may be self-limited if it is mild, but in sometimes seroma may be organized or encysted and need surgical

intervention due to failure of conservative treatment.² Seroma formation lead to significant morbidity and causes delay in the initiation of adjuvant therapy.^{3, 4} Meticulous attention to technique of breast surgery to minimize the leakage from dissected blood vessels and lymphatics may reduce the incidence of seroma formation.⁵ Electrocautery has been reported as one of the causative factors in seroma formation, due to its charring effect on tissue.⁶ The aim of our study was to



find if there is a significant association of use of electrocautery with seroma formation, while performing modified radical mastectomy (MRM).

Methodology:

This is prospective observational study. In this study 82 patients presented with carcinoma of breast and managed by MRM in our institute during period of 1st July 2017 to 31st June 2019 were included. Patients were enrolled in the study after they provided verbal informed consent. In our institute some units of surgery use to do MRM with electrocautery while other units uses used scalpel to raise the skin flap along with aid of scissors. Patients undergoing MRM divided into two groups, in one group (Group A) we used electrocautery for raising the skin flap and axillary dissection while in another group (Group B) we used scalpel to raise the skin flap along with aid of scissors and suture ligation for axillary dissection. Incidence of seroma formation was compared in both the groups. Results in both the groups were compared by chi-square method

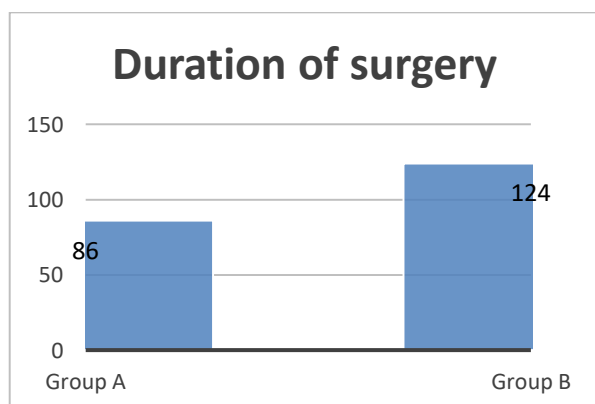
Results:

In this study 82 patients were enrolled. Their median age was 52years in Group A and 50 years in Group B.

Average tumour size was 5.1 cm in Group A and 5.4 cm in Group B.

Mean duration of surgery was less in electrocautery group. Mean duration of surgery in Group A was 86 min while in Group B was 124 min.

Fig 1: Duration of surgery

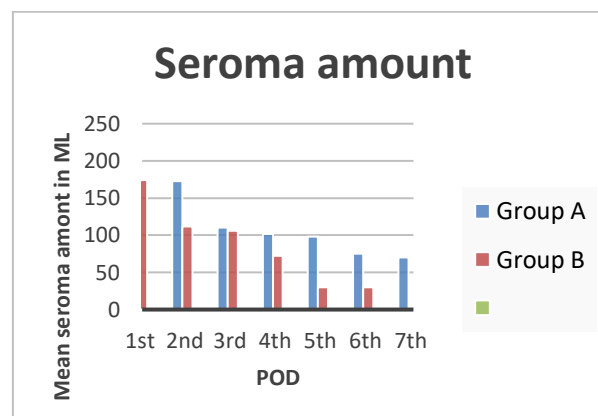


Seroma amount was more in electrocautery group. Drain was removed on POD 8 in Group A and POD 7 in Group B. Mean seroma amount from 1st to 7th POD as follows:

Table 1: Mean Seroma Amount postoperatively

Post-Operative Day (POD)	Mean seroma amount in ml	
	Group A	Group B
1 st	212	174
2 nd	173	112
3 rd	110	106
4 th	102	72
5 th	98	30
6 th	75	30
7 th	70	0

Figure No. 2: Mean seroma amount



Mean duration of time for removing a drain: Mean duration of removal of drain in Group A was on 8th POD and Group B was on 5th POD. Drain of all patient in Group A was removed on 9th POD and Group B was removed on 7th POD.

Median hospital stay in Group A was 9 days and in Group B was 8 days.

Discussion :

According to this study, mean duration of surgery was more in Group (124 min) in which we have used scalpel to raise the skin flap along with aid of scissors and suture ligation for axillary dissection. Similar result were found in Rahul Kumar N. Chavan et al study which states that scalpel dissection and suture ligation group mean



duration of surgery was (109 min) than electrocautery group (77 min).⁷

This study showed that mean seroma amount was more in electrocautery group. Similar result were seen in Porter KA et al, Rahulkumar N. Chavan et al and Keogh G et al study.^{6,7,8}

In our study mean duration of removal of drain in electrocautery group was 8th POD and other group was 5th POD. Similar result were seen in Rahul kumar N. Chavan et al study which states that electrocautery group was mean duration of removal of drain was 9th POD and other group was 5th POD.⁷

Haval S et al⁹ reported that the use of harmonic scalpel in modified radical mastectomy was associated with reduced blood loss and fewer postoperative complications compared to electrocautery. Similarly, Shrestha D et al¹⁰ found that harmonic scalpel offered advantages in terms of operative outcomes and postoperative recovery over electrocautery in breast cancer patients. In line with these findings, Samal S et al¹¹ also demonstrated that skin flaps raised with harmonic scalpel during modified radical mastectomy resulted in better intraoperative and postoperative outcomes compared to those raised with electrocautery.

Cicio D et al¹², through a systematic review and meta-analysis, concluded that cold scalpel dissection reduced postoperative complications compared to electrocautery in modified radical mastectomy. In another meta-analysis, Oyewale S et al¹³ demonstrated that different flap-raising techniques, including harmonic scalpel and cold dissection, were superior to electrocautery in lowering complication rates. Similarly, Kumar V et al¹⁴ reported that ultrasonic shears significantly reduced postoperative morbidity when compared with electrocautery. Supporting these findings, Park HS et al¹⁵ observed that the use of bipolar electrosurgical systems was associated with less postoperative drainage compared to conventional electrocautery in mastectomy patients.

Our study also showed that mean duration of hospital stay was more in electrocautery group (9 days) than Scalpel group (8 days). Hence patient satisfaction is less in case of electrocautery group.

The mastectomy is considered a special surgery considering the aesthetic and bodily autonomy issues associated with it. Patients should be counselled regarding the same and special interest should be given

to cosmetic preservation or reconstruction whenever possible.¹⁶⁻¹⁸

The association of electrocautery and seroma formation following mastectomy could be due to two reasons, i.e., the fact that use of electrocautery leads to temporary sealing of lymphatic channels, which open up later on allowing egress of fluid without cells, and extensive fat necrosis and lymphatic vessels damage due to tissue burn leads to further seroma formation.

Conclusion :

Electrocautery use in MRM is associated with more seroma formation, long duration of drain in situ, long duration of hospital stay and less patient satisfaction. Hence electrocautery should be used judiciously in breast surgery. Preferably scalpel should be used to raise the skin flap. For confirmatory result needs further study.

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