ORIGINAL ARTICLE

Comparison of Blood Loss between Harmonic Scalpel and Monopolar Electrocautry in Modified Radical Mastectomy

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ABSTRACT

Aim: To compare mean blood loss between harmonic scalpel and monopolar electrocautry in modified radical mastectomy

Methods: This comparative study was conducted from 1st June 2015 to 31st December 2015 in the Department of Surgery, Bolan Medical Complex Hospital Quetta. A total of 100 females (50 in two groups) between 20-70 years of age with carcinoma breast were included, Thrombocytopenia, Hemophilia, Liver disease, and not fit for anesthesia were excluded from the study. Patients were randomly allocated into two equal groups; group A and group B. Group A was allotted for harmonic scalpel (HS) and Group B to the patients treated dissected with monopolar electrocautry (ME).

Results: Mean age was calculated as 56.87±6.45 years, comparison of mean blood loss was calculated as 79.52±8.41 ml in Group-A and 206.34±6.89 ml in Group-B, p value was calculated as <0.001 showing a significant difference between the two techniques.

Conclusion: The mean post-operative bleeding was significantly lower in harmonic scalpel when compared with monopolar electrocautry in modified radical mastectomy.

Keywords: Blood loss, Harmonic scalpel, Monopolar electrocautry, Modified radical mastectomy

INTRODUCTION

Breast cancer is a commonest malignancy in females and accounts for 18% of all female cancers, yearly around one million new cases with this morbidity are recorded.[1] In our country, this morbidity is found commonly in younger age women as compared to the Western world where it is prevalent in older age women (≥60 years).[2] This morbidity is significantly higher in Pakistani females as compared to other Asian countries.[3] Surgical management remains the mainstay of treatment. Importantly, complications of surgery are recorded to be minimal for prevention of undue delay in the adjuvant treatment of this morbidity. Modified radical mastectomy is the commonest surgical procedure performed for the management of breast cancer[4] Conventionally, raising the skin flaps, shaving off the breast from the pectoral wall and axillary lymph node dissection is performed by either scalpel (sharp dissection) or by electrocautery.[5] The harmonic scalpel is an emerging surgical instrument which converts electrical energy in higher frequency (55.000 Hz) mechanical vibrations and facilitates intra-operative cutting and coagulation at the same time.

The excursion of vibration increases with higher level of activity till it reaches 100µm at level 5, where the coagulating power is lower, while the cutting power is higher. This takes place at a comparatively lower temperature and causing a little injury (<1.5 mm) as compared with electrocautery[6] In clinical practice, a better surgical technique is considered on the basis of increased awareness of measurement of the blood loss during surgery.[7]

Previous data is variant regarding per-operative blood loss in patients treated with Harmonic Scalpel v/s Monopolar Electrocautry in Modified Radical Mastectomy, however, this study was planned which may be helpful for the surgeons in choosing a better technique regarding per-operative blood loss.

PATIENTS AND METHODS

This comparative study was conducted from 1st June 2015 to 31st December 2015 in the Department of Surgery, Bolan Medical Complex Hospital Quetta. A total of 100 females (50 in two groups) between 20-70 years of age with carcinoma breast were enrolled in the study, while those women had previous breast surgery, Thrombocytopenia, Hemophilia, Liver disease, and not fit for anesthesia were excluded from the study. An informed consent of the patients was also obtained to include their data in the study. Patients were randomly allocated into two equal groups through draws method. Two draws were made, one for group A and other for group B. Each patient was asked to pick one draw and included in respective group (i.e., A or B). Group A was allotted for Harmonic Scalpel (HS) and Group B to the patients treated dissected with Monopolar

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Electrocautry (ME). Both procedures were performed according to standard guidelines and departmental protocols. Per-operative blood loss was estimated by weighing the dry sponges preoperatively, the soaked blood sponges were directly weighed and 1gm was considered as 1mL. The collected data was analyzed for statistical analysis using SPSS (Version 18).

RESULTS

In our study, age of the patients was calculated, it shows that 6(12%) in Group A and 8(16%) in Group B were between 20-50 years of age and 44(88%) in Group A and 42(84%) in Group B were between 51-70 years of age and mean was 56.87±6.45 years (Table 1). Comparison of mean blood loss was calculated as 79.52±8.41ml in Group A and 206.34±6.89 ml in Group B, p value was calculated as <0.001 showing a significant difference between the two techniques (Table 2).

Table 1: Age distribution (n=100)

Age (Yrs)	Group A	Group B
20 – 50	6(12%)	8(16%)
51 – 70	44(88%)	42(84%)
Total	50(100%)	40(100%)

Table 2: Comparison of mean blood loss (n=100)

Mean blood loss(ml)	Group A	Group B
	79.52±8.41	206.34±6.89
P value	<0.001	

DISCUSSION

The harmonic scalpel is an innovative medical equipment which vibrates at 55.5 kHz and may cause three synergistic effects including cavitation, coagulation, and cutting to attain effective hemostasis and dissection of tissue at a particular point. It has advantage of reduced thermal spread which lowers the rate of destruction of adjacent tissue[8-9]. This device is approved from the United States, Food and Drug Administration (FDA) for the ligation of vessels up to 5 mm in diameter. The advantages and safety are reported for surgeries in various anatomical regions[10,11,12].

In our study, on comparison of mean blood loss was calculated as 79.52±8.41 ml in Group-A and 206.34±6.89 ml in Group-B, p value was calculated as <0.001 showing a significant difference between the two methods.

A recent study[13] by Allah Nawaz and others compared harmonics scalpel with electrocautery use in cases selected for axillary dissection for carcinoma breast and revealed that mean age was 53.52±9.8 years. Mean axillary drain output in cases with harmonic scalpel was 167.75±43.90 when compared to 310.00±60.09 in cases with electrocautery group, they concluded that the use of harmonic scalpel in axillary dissection decreases total mean axillary drain output and reduces frequency of axillary numbness when compared to utilizing electrocautery, their findings are in support of our study.

Another recent study by Damani SR and colleagues[14] compared the intra-operative and post-operative outcome of modified radical mastectomy (MRM) by using harmonic scalpel v/s electrocautery, they recorded mean blood loss as 82.0±9.5 in hormonal scalpel group while 176.8±41.5ml blood loss in monopolar diathermy group, these findings are also in agreement with the current study.

Kontos et al[16] also showed promising results[15]. Another study used harmonic scalpel for dissection in modified radical mastectomy and revealed encouraging results regarding operative time, intra-operative blood loss and lymphatic drainage. Their findings are also supporting our findings. Adwani and others also reported encouraging results that are in favour of our study[17].

CONCLUSION

It is concluded that mean post-operative blood loss is significantly lower in patients undergoing harmonic scalpel when compared with monopolar electrocautry in modified radical mastectomy.

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