Use of Ultrasonic Shears in Patients with Breast Cancer Undergoing Axillary Dissection—A Pilot Study

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Abstract Patients with breast cancer and positive sentinel node biopsy usually require axillary dissection. Different instruments are used for axillary dissection like regular scalpel, monopolar cautery, bipolar cautery etc. All these instruments are having its advantages and disadvantages. Our dept did a pilot study to know the efficacy of ultrasonic shears over cautery for axillary dissection. Parameters considered were cumulative drain amount, number of days with the drain and number of lymphnodes harvested. Ultrasonic shear machine delivers precisely directed mechanical energy with an ultrasonic vibrating blade. A single device dissects, cuts, grasps, spot coagulates. This machine was used for doing axillary dissection in one group and regular cautery in the other group. Study period was from April 2011 to June 2011 at Dept of Surgical Oncology, St Johns Hospital, Bangalore. Nine people in the ultrasonic shear group and 11 people in the cautery group were included in the pilot study. No significant difference were noticed in the cumulative drain amount, number of days with the drain, and number of lymphnodes harvested in both the groups. Axillary dissection using ultrasonic shears do not show any significant difference in the cumulative drain amount, number of days with the drain, and number of lymphnodes harvested. These are the findings of the pilot study, further prospective randomized studies are required for substantiating the findings.

Keywords Breast · Cancer · Cautery · Ultrasonic shears

Introduction

Even in the era of sentinel lymphnode biopsy, most patients undergoing either modified radical mastectomy or breast conserving surgery for breast cancer require axillary dissection. Axillary dissection is usually associated with prolonged serous drainage and wound seroma formation with a reported rate ranging from 3% to 60%. The presence of an axillary drain requires proper management, is uncomfortable for the patient, and causes pain and limited arm movements. Moreover, it represents a potential portal for bacterial entrance, increasing the risk of wound infections and longer hospital stay. Axillary dissection is part of standard surgical treatment of breast cancer. Although different instruments are used for doing dissection like scalpel, monopolar, cautery, bipolar cautery, scissors etc.—there is no reduction in the amount of axillary drainage [1, 2]. There are studies showing use of ultrasound shears reducing axillary drainage after axillary surgery for breast cancer [3–6].

Aim

Our aim was to do a pilot study to know the efficacy of ultrasonic shears [USS] over cautery [CT] for axillary dissection. Main parameters compared were cumulative drain amount and number of days with the drain. Since axillary drainage was directly proportional to the number of lymphnodes harvested, this parameter was also taken into consideration [3, 6].

Materials and Method

In our study we compared Ultrasonic shear machine with cautery. Ultrasonic shear machine delivers precisely direct-

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ed mechanical energy with an ultrasonic vibrating blade. It has been proposed to seal lymphatics and there by reduce seroma formation and drain output [3, 6].

Our study period was between April 2011 and June 2011. We recruited 20 patients during the period. Computer generated randomization was used for the same. We recruited 9 patients in the ultrasound shear group [USS] and 11 patients in the cautery group [CT].

Inclusion Criteria Operable breast cancer [primary or post neoadjuvant chemotherapy], undergoing modified radical mastectomy [MRM], level I and II axillary lymphnode dissection [ALND].

Exclusion Criteria Metastatic disease, Immediate reconstruction cases, Level III nodal clearance, breast conservation surgery [BCS].

Informed consent was taken from all patients. All patients counselled by our breast counsellor regarding surgery, to manage drain, to measure daily drain amount, to record in a chart and post operative excercises. All patients underwent modified radical mastectomy. All drains were removed when amount is less than 30 ml for 2 consecutive days. The **time of drain removal** is defined as the length of time [in days] the drain remains in place. **Cumulative drainage [ml]**—total amount of drainage.

Statistical Analysis

Randomization

Computer generated randomized list will be prepared to randomize the study subjects into two arms.

Statistical Techniques

Descriptive statistics will be reported using mean and standard deviation for continuous variables and number (percentages) for the categorical variables. Independent t test will be used to compare the cumulative drainage amount between the two study groups if it is normally distributed, otherwise Mann Whitney U test will be used.

Chi—square test will be used to compare the categorical variables. Probability value less than 5% will be considered as statistically significant.

Results

With 20 patients in our study using two techniques—we did not see any significant difference in cumulative drainage, number of lymphnodes harvested and number of days with the drain [Table 1].

Discussion

In order to reduce the morbidity after axillary dissection, several techniques were tried—this included techniques used to reduce axillary drainage after dissection. Browse et al. practised shoulder immobilization vs free arm movements after axillary surgery [7]. Later Burak et al. used Bovine thrombin application vs no application for controlling axillary drainage and seroma formation [6]. Some groups tried low vacuum drainage vs high vacuum drainage, long stay drain vs short stay drain, pressure garment vs non-pressure garment for reducing the axillary drainage [8–10].

Wedderburn et al used low vacuum drainage vs high vacuum drainage technique [11], 5-Day drainage vs 8-day drainage was practiced by Gupta et al [12], Berger et al suggested fibrin glue vs no fibrin glue for controlling axillary drainage and seroma formation [13].

Zavotsky et al practiced drain insertion vs no drain for reducing seroma formation [14], Use of electrocautery vs scalpel was advocated by Porter et al [1], Immediate reconstruction vs radical mastectomy alone and Buttress suture vs non—buttress suture were some techniques practiced earlier to reduce the axillary drainage [15, 16]. None of these studies showed any significant reduction in cumulative drainage after axillary dissection for breast surgery.

Franco Lumanchi et al [2004] studied the usefulness of ultrasound scissors in reducing serous drainage after axillary dissection and found a significant [$P < 0.05$] reduction [3, 6]. Deo SV et al [2002] [4] and Galatius H

Table 1 Master table

Group	NO	Cumulative drainage			No of lymphnodes harvested			No of days with drain		
		Mean	SD	P Value	Mean	SD	P Value	Mean	SD	P Value
1[USS]	9	528.78	98.569	.346	18.22	4.5	.231	8.78	.972	.805
2[CT]	11	576.36	117.411	.338	20.55	3.804	.242	8.91	1.300	.799

et al [2003] [5] studied the effect of harmonic scalpel dissection in breast surgery.

There are few studies in the literature showing the use of ultrasonic shears in reducing axillary drainage and seroma [3–6]. These studies have shown to reduce the axillary drainage. Our study is not showing any significant difference.

Conclusions

Present study does not show any significant difference in the cumulative drain amount, number of days with the drain and number of lymphnodes harvested between the two groups. These are the findings of the pilot study, further prospective randomized studies are required for substantiating the findings.

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