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Mini Review

The Utility of LigaSure™ in Breast Surgery

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Abstract

Aim: The objective of this article is to evaluate the efficiency of LigaSure™ Small Jaw vessel-sealing device in breast surgery.

Materials and Methods: We conducted a retrospective study between November 2013 and October 2019. This study included 86 patients (84 females and 2 males) who underwent radical breast surgery for neoplasia.

The patients were divided into 2 groups according to the device used for dissection during surgery. Electrocautery was used on patients in the first group, and LigaSure™ Small Jaw was used on patients in the second group.

We measured the operative time, hospitalization period, and quantity and duration of the secretions expelled through the drainage tubes. We measured the quantity of secretions in millilitres and the operative time in minutes.

Results: No significant differences were observed between the groups in terms of patient clinical or demographic data, length of hospitalization, or quantity or duration of the secretions expelled through the drainage tubes. Operating time was shorter for patients in group 2. No early postoperative complications were noticed in either of the 2 groups.

Conclusions: The use of LigaSure™ devices in breast surgery shortens operative time but failed to reduce the hospitalization period or the quantity or duration of the drainage.

Keywords: Breast Surgery; LigaSure™, Cancer

Introduction

A report provided by the International Agency for Research on Cancer in 2018 showed that breast cancer ranks second among cancers in terms of prevalence, with an incidence of 11.5%, and third in terms of mortality in Romania [1]. The major objective of surgical treatment today is the local control of cancer as a part of systemic therapy, but another significant objective is to achieve a favourable cosmetic outcome in the process, with the possibility of immediate or later breast reconstruction [2]. Like any type of surgery, however, breast surgery is accompanied by its own unique package of challenges. The occurrence of postoperative seromas is a frequently encountered complication (15% - 85% of cases) [3] and is always approached by means of an appropriate surgical technique and through subcutaneous drainage [4,5].

The occurrence of seromas leads to a series of complications, of which we would like to mention tegumentary necrosis, wound dehiscence, extensive hospitalization, and, finally, delayed commencement of radiotherapy and/or chemotherapy [5]. One of the instruments used in breast surgery is the electrocautery machine; however, although this machine is effective from a haemostatic point of view, it is associated with the occurrence of seromas [6].

Classical haemostasis represented by diathermy, ligatures, or clips is successfully used in surgery in general, but these methods are often long-term, increasing the operative time and the time spent by the patient under general anaesthesia [7]. In this sense, numerous instruments have been developed for the purpose of reducing the operative time and minimizing postoperative complications. LigaSure™ Small Jaw is one such instrument, used successfully in mammary gland surgery.

The purpose of this study was to evaluate the efficiency of LigaSure™ Small Jaw vessel-sealing device in breast surgery.

Material and Methods

We conducted a retrospective study in the General Surgical Clinic No. 1 at the Emergency Clinical County Hospital of Târgu Mureș in Romania between November 2013 and October 2019.

We included in the sample all the patients who had been diagnosed with breast cancer and in whose case radical surgery was performed (total mastectomy with lymph node removal, partial mastectomy with lymph node removal, or complete axillary lymph node dissection). All the patients were operated on by the same main surgeon, and all underwent a breast ultrasound and mammography and also a needle biopsy of the breast prior to the surgery. All patients included in the study had a Breast Imaging, Reporting, And Data System (BI-RADS) score of 5 or 6, and 60% of the lesions were multicentric.

This study did not include patients in whose case non-radical surgery was performed (cleaning mastectomy or partial mastectomy without lymph node removal), nor did it include patients who were discharged with axillary drainage.

After applying the inclusion and exclusion criteria, we ultimately included a total of 86 patients in this study. The patients were divided into 2 groups according to the device used for dissection during

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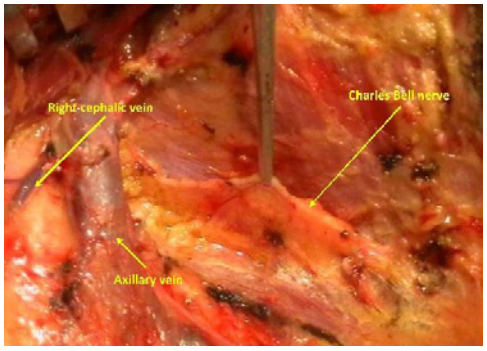

Figure 1: Highlights of the vascular and nervous elements of the axilla.

Table 1: Clinical and demographic data.

	Group1 Electrocautery	Group 2 LigaSure™ Small Jaw
Women/men	67/0	17/2
Type of surgery		
Modified radical mastectomy with axillary lymph node dissection	54/0	9/1
Partial mastectomy with lymph node dissection	11/0	7/1
Isolated axillary lymph node dissection	2/0	1/0

surgery. Electrocautery was used on patients in the first group, and LigaSure™ Small Jaw was used on patients in the second group.

We statistically compared the 2 groups in terms of the length of the surgical intervention and hospitalization period and the quantity and duration of the secretions expelled through the drainage tubes. We measured the quantity of secretions in millilitres and the operative time in minutes.

All patients were informed of the characteristics of these devices and of the possible implicit complications.

We conducted this study in accordance with the Declaration of Helsinki, the principles of Good Clinical Practice, and applicable regulatory requirements. Before the initiation of surgery, we obtained written consent from all patients.

Results

Of the 86 patients included in this study, 84 were females and 2 were males.

Quantitative data were expressed as means, while qualitative data (sex and the type of surgery) were expressed as percentages or numbers.

The demographic and clinical data of the two patient groups were similar and are presented in Table 1.

We measured the operative time from incision to skin suture and found no significant statistical differences between the 2 groups ($P > 0.05$). The results are presented in Table 2.

Among patients who underwent modified radical mastectomy with axillary lymph node dissection, the hospitalization period was higher for patients in group 1, who had a mean hospitalization period

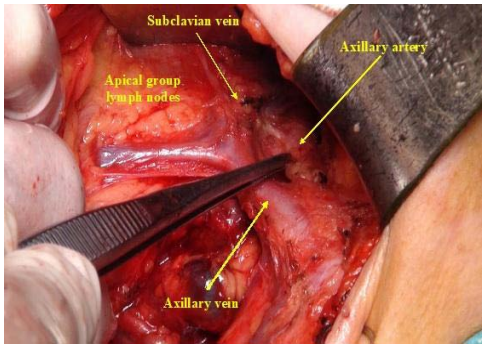

Figure 2: Highlights of the vasculo-nervous elements of the axilla and the apical lymph nodes.

Table 2: Operative time.

Type of surgery	Group 1 Electrocautery	Group 2 LigaSure™ Small Jaw
Modified radical mastectomy with axillary lymph node dissection	88.93	72.24
Partial mastectomy with lymph node removal	65.24	60.42
Isolated axillary lymph node dissection	45.32	40.44

of 6.8 days, than for patients in group 2, who had a mean hospitalization period of 7.1 days ($P > 0.05$). In terms of hospitalization period, there was no significant statistical difference between the group of patients who underwent partial mastectomy with lymph node dissection and the group of patients who underwent isolated axillary lymph node dissection.

The quantity of secretions expelled through the drainage tube was greater among patients in group 2, who expelled 115.97 ml daily, then among patients in group 1, who expelled only 79.37 ml daily.

The duration of the drainage was similar to the hospitalization period because the tubes were extracted on the day the patient was discharged. There was no significant statistical difference between the 2 groups in this regard.

No early postoperative complications were declared among the studied cohort of patients.

Discussion

We noted that the use of the LigaSure™ Small Jaw device proved more efficient, in that it shortened the operative time, but the operative time was not statistically significantly different between the 2 groups. The utility of LigaSure™ Small Jaw in reducing operative time and controlling haemorrhage has been reported not only in surgery on the thyroid gland [8,9] but also in skin-sparing mastectomy for breast cancer [10]. This aspect has also been demonstrated in a meta-analysis that compared the LigaSure™ Small Jaw device to other methods of haemostasis/lymphostasis and found that the LigaSure™ Small Jaw shortened the operative time and reduced haemorrhage and other complications [11].

Disease-free survival and overall survival decrease proportionally with the increase of the number of positive axillary lymph nodes [12], which is why lymph node dissection is very important. The ergonomics of this device facilitate dissection of the axillary lymph node, and conservation of the vasculo-nervous elements of the axilla

is possible (Figure 1). At the same time, removal of the apical lymph nodes is easy to perform (Figure 2).

We did not observe any significant difference between the 2 groups regarding the length of hospitalization or the quantity or duration of the secretions expelled through the drainage tubes. This fact may be attributable to the fact that group 2 was significantly smaller than group 1.

This study was characterized by some limitations, such as the limited number of patients involved and the retrospective nature of the study; however, we tried to reduce these biases by following chronological order in the selection of consecutive clinical cases, operated on by the same main surgeon.

Conclusions

The use of LigaSure™ devices in breast surgery shortens operative time but failed to reduce the hospitalization period or the quantity or duration of the drainage. The ergonomics of this device facilitate dissection of the axillary lymph node and enable conservation of the vasculo-nervous elements of the axilla.

Conflict of Interests

The authors declare no conflicts of interests.

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