Article

Not peer-reviewed version

Wide Tumorectome and Sentinel Lymph-Node Removal under Local Anesthesia in Out-Patient Surgert: A Retrospective Study

Paolo Izzo *, Claudia De Intinis, Silvia Lai, Antonio D'Urso, Simone Sibio, Pierfrancesco Di Cello, Andrea Polistena, Luciano Izzo, Marcello Molle, Sara Izzo

Posted Date: 29 September 2024

doi: 10.20944/preprints202409.2218.v1

Keywords: Early Breast Cancer; Sentinel Lymph-Node; Local Anesthesia; Health Care System; Out-Patient Surgery; Ambulatory Surgery; Breast Unit

Article

Wide Tumorectomy and Sentinel Lymph-Node Removal Under Local Anesthesia in Out-Patient Surgery: A Retrospective Study

Paolo Izzo [1]*, Claudia De Intinis [1], Silvia Lai [3], Antonio D'Urso [1], Simone Sibio [1], Pierfrancesco Di Cello [4], Andrea Polistena [1], Luciano Izzo [1], Marcello Molle [2] and Sara Izzo [2]

[1] Pietro Valdoni" Department of Surgery, Policlinico "Umberto I", "Sapienza" University of Rome, Italy
[2] Multidisciplinary Department of Medical-Surgical and Dental Specialties, Plastic Surgery Unit, Università degli Studi della Campania "Luigi Vanvitelli, Italy
[3] Department of Translational and Precision Medicine, Nephrology Unit, Sapienza University of Rome, Italy
[4] UOC General Surgery Frosinone-Alatri at ASL Frosinone, Italy
* Correspondenceluciano.izzo@uniroma1.it

Abstract: Aims: The aim of our work was to demonstrate the possibility, in carefully selected cases, to perform operations under local anesthesia with a benefit to the patient and savings for national health care. **Method**: 123 patients with breast cancer underwent quadrantectomy or wide tumorectomy and sentinel lymph node removal under local anesthesia in out-patient surgery. **Results**: Of the 123 patients, 9 had micro-metastases and 4 had macro-metastases and only three of this had metastasis in other lymph nodes. **Conclusions**: Our results demonstrate that it is possible in selected cases to operate on breast cancer in out-patient surgery, with an advantage for the patient and savings for national health care.

Keywords: early breast cancer; sentinel lymph-node; local anesthesia; health care system; out-patient surgery; ambulatory surgery; breast unit

Introduction

Breast carcinoma is the most diffuse tumor in the female population of the western countries and is still today the primary cause of death by cancer. Although much has been done to combat this type of tumor, many steps still need to be taken in the field of prevention as well as in the pharmacological and surgical fields and considering the health care costs associated with this widespread pathology.

The improvements obtained by modern diagnostic techniques have allowed for earlier and earlier diagnosis and, consequently, mastectomy, which once was the standard, has been gradually substituted with more conservative procedures.

Moreover, the introduction of the sentinel lymph-node technique has greatly simplified breast surgery [1].

The state of lymph nodes in the armpit is a very important prognostic parameter and it has been widely demonstrated that removing the sentinel lymph-node is the same as lymphadenectomy with a noticeable advantage for patients, in particular, for morbidity and mobility of the arm, avoiding the more frequent complication of lymphadenectomy that is, lymphedema, paresthesia and fibrous tissue.

In recent years several authors have reported their experience of lymph-node removal under local anesthesia in out-patient surgery, demonstrated further advantages not only for the patients but also for health care costs [2,3].

We maintain that everything should be done to improve the treatment of the breast carcinoma and, considering the wide diffusion of this pathology, create a savings in national health care costs.

 doi:10.20944/preprints202409.2218.v

This report outlines our experience in quadrantectomy or wide tumorectomy and lymph-node removal under local anesthesia in out-patient surgery, in patients with small tumors who, when examined carefully with ultrasound and a cytologic exam, were most probably negative for the presence of axillary metastases.

Materials And Methods

In this retrospective study, from January 2008 to November 2023, 123 patients between the ages of 27 and 83 (average age 54) with breast carcinomas of a diameter less than or equal to 2cm (rarely more than 2 cm) and who, with a careful study of the armpit with ultrasound and cytologic exams, presented negative lymph nodes, were selected for quadrantectomy or wide tumorectomy and sentinel lymph node removal using methylene blue and lymphoscintigraphy with an injection perilesional of a mixture of colloidal human albumin particles labeled with technetium Tc 99m, and identified, using a gamma probe, under local anesthesia in an out-patient environment.

The patients were previously given complete information concerning the surgery with a completed informed consent. The surgery is performed while the patient is lying down and with the extension of the upper arm laterally, with constant monitoring of vital statistics (Sat O2, Fc) and with a peripheral venous access for infusion of liquids or drugs if necessary.

The local anesthetic used was Mepivacaine 2% 4mg-Kg max 550 mg, with sodium bicarbonate 1:10. All patients were discharged after a short clinical observation with antibiotic therapy and a mild analgesic where needed.

The histological examination by frozen sections of sentinel lymph-node was not performed since the complete examination of the lymph-node to identify micro-metastases or isolated cells requires 45 to 60 minutes, which limits effective use of this technique.

Results

Of the 123 patients operated with this method, 13 presented metastases of the sentinel lymph-node, of which 9 (% of cases) were micro-metastases; 2 had not lymphadenectomy and the other all later underwent lymphadenectomy. Of the 4 with macro-metastases only 3 had metastases in one, or more, other lymph-nodes; all other patients had lymph-nodes without metastases.

Table 1. Cases of metastatic lymph-nodes.

Cases	T (cm)	Grading	Lymph Sent.	Lymphadenectomy	ER	PgR	Ki-67	HER2
#1	1,1	G2	<0,2	negative	neg	neg	35%	3+
#2	0,7	G2	<0,2	negative	60%	neg	5%	neg
#3	1,5	G2	>0,2<0,5	not performed	90%	85%	7%	neg
#4	1.8	G3	<0,2	negative	neg	neg	45%	neg
#5	3	G2	<0,2	negative	90%	70%	20%	neg
#6	1.2	G1	<0,2	negative	90%	90%	7%	neg
#7	1.9	G3	>0,2<0.5	negative	70%	95%	55%	neg
#8	2	G2	>0.2<0.5	negative	95%	95%	7%	neg
#9	1.3	G3	macro	negative	95%	95%	45%	neg
#10	2	G2	macro	positive	90%	75%	20%	neg
#11	1.2	G2	>0.2<0.5	not performed	90%	90%	15%	neg
#12	2.5	G3	macro	positive	90%	55%	45%	neg
#13	1.5	G3	macro	positive	95%	95%	9%	neg

 doi:10.20944/preprints202409.2218.v

Discussion

The approach to prevention and treatment of breast carcinoma has recently improved thanks to refinements in diagnostic techniques, renewed attention to screening methods and the institution of multi-disciplinary centers dedicated solely to senology (the so called "breast units") [4,5].

As in pharmacological treatment, the surgical field has also seen progressive technical improvement, partly due to better knowledge of the biology of the breast tumor and partly to the discovery of lesions of smaller dimensions. Therefore, more conservative procedures may be used in place of the more invasive procedures, allowing for more acceptable esthetic results and a savings in health care costs [6].

Until 1994 mastectomy or quadrantectomy were usually performed with armpit lymph-adenectomy which, however, had short term side effects and above all long-term side effects which had a negative effect on the outcome and comfort of the patients (lymphedema, reduced mobility, paresthesia and fibrosis tissue). The technique of sentinel lymph-node. The physio-pathological rationale of the sentinel lymph-node technique lies in the observation that metastatic diffusion happens in a progressive manner through the various lymph-node levels [7,8].

The introduction of sentinel lymph-node technique in 1994, the year in which the description of the technique using a colorant methylene blue was published for the first time, has grown rapidly has received increasing consensus among breast cancer surgeons. The technique currently uses injections round the lesion of technetium Tc 99m and a gamma probe during the intervention to identify the radioactive lymph-node. This technique, which does not present particular problems of radioactivity, in the hands of experts manages to identify sentinel lymph-node in more than 90% of cases, and, when identified, the correlation between the sentinel lymph-node and the condition of the other lymph-nodes is notable. In fact, the predicted negative value is estimated at 96%.

Although in 5% the technique may give false negative results, this disadvantage is compensated by the fact that removal of the single lymph-node seems to be more accurate since examining a single lymph-node allows for the preparation of many sections which are also colored by immunohistochemical and the evaluation of the presence of isolated cells.

Many studies have been conducted of this method, which has permitted the identification of the radioactivity also cases of lymph-nodes of internal mammary chain, which with the discontinuation of wide radical mastectomy were no longer evaluated [9].

The introduction of this technique has made operation on breast cancer fairly simply and less fatiguing for the patient. As other authors [10] to avoid hospitalization, reduce health costs, and offer the patient the possibility to recover in the comfort of their own home, we have decided to conduct a feasibility study. It has not been possible to perform a satisfactory histological exam during the operation, and therefore only patients who had metastasis later underwent lymphadenectomy. Only 12 of these needed another operation and 9 had micro-metastasis or isolated cells. Recently published studies showed that in these cases lymphadenectomy may not be necessary [11]. In our case study, only 2 in 12 had metastasis in other lymph nodes, while all others were histologically negative in the other lymph nodes.

Our results demonstrate that, in addition to the clinical exam, if a careful ultrasound examination of the armpit is performed and cytological exam in doubtful cases the probability of macro-metastases is very remote. Concerning the micro-metastases and isolated cells which are not possible to identify in the pre-operatory phase, is necessary, first of all, to define their significance; however, if further studies confirmed that the lymphadenectomy is useless in cases of micro-metastases or isolated malignant cells the problem could be considered resolved [12].

In conclusion our results demonstrate that if a careful study of the armpit is performed in the pre-operatory phase, is possible to perform wide tumorectomy or quadrantectomy under anesthesia and without hospitalization in well selected cases, with a notable advantage for the patients, with minimal anatomic damage without effects of surgical radicality (see Figures 1–3) and considerable savings for the National Health Care System [13,14].

 doi:10.20944/preprints202409.2218.v

Figure 1.

Figure 2.

 doi:10.20944/preprints202409.2218.v

Figure 3.

References

1. Giuliano AE, Kirgan DM, Guenther JM, Morton DL. "Lymphatic mapping and sentinel lymphadenectomy for breast cancer". Ann Surg 1994; 220: 391-98.
2. Luini A, Gatti G, Frasson A, Naninato P, Magalotti C, Arnone P, Viale G, Pruneri G, Galimberti V, De Cicco C, Veronesi U "Sentinel Lymph Node Biopsy Performed With Local Anesthesia in Patients With Early-Stage Breast Carcinoma" Arch Surg 2002;137:1157-1160
3. Van Berlo C.L.H., Hess D.A., Nijhuis P.A.H., Leys E., Gerritsen H.A.M., Schapers R.F.M. "Ambulatory sentinel node biopsy under local anaesthesia for patients with early breast cancer" EJSO 2003; 29: 383-38
4. Ranieri E., Caprio G.,Civitelli L., Barberi S., Ceccarelli F., Virno F. "Multidisciplinary Breast Unit: The Activity of the Past 15 Years" The Breast Journal, Volume 10, Number 6, 2004 554-557
5. Duiran JR. How to organize a multidisciplinary clinic for the management of breast cancer.
6. Luini A., Caldarella P., Gatti G., Veronesi P., Vento A.R., Naninato P., Arnone P., Sangalli C., Brenelli F., Sosnovskikh I., Peradze N., Luberth C.A.D., Viale G., Paganelli G. "The sentinel node biopsy under local anesthesia in breast cancer: Advantages and problems, how the technique influenced the activity of a breast surgery department; update from the European Institute of Oncology with more than 1000 cases" The Breast 2007 16, 527-532
7. Albertini JJ, Lyman GH, Cox C, Yeathan T, Balducci L, Ku N, Shivers S, Berman C, Wells K, Rapaport D, Shons A, Horton J,Greemberg H, Nicosia S, Clark R, Cantor A, Reintgen DS. "Lymphatic mapping and sentinel node biopsy in the patient with breast cancer" JAMA 1996; 276: 1818-22
8. Nalk AM, Fey J., Gemignani M.,Heerdt A., Montgomery L., Petrek J., Port E., Sacchini V., Sclafani L., VanZee K., Wagman R., Borgen Pl., Cody HS 3rd. "The risk of axillary relapse after sentinel lymph node biopsy for breast cancer is comparable with that of axillary lymph node dissection: a follow-up study of 4008 procedures. Ann Surg 2004; 240: 462-8
9. Madsen E., Gobardhan P., Bongers V., Albregts M., Burgmans J., De Hooge P., Van Gorp J., Van Dalen T. "The impact on post-surgical treatment of sentinel lymph node biopsy of internal mammary lymph nodes in patients with breast cancer. Ann Surg Oncol 2007; 14: 1486-92
10. Hirokawa T., Kinoshita T., Nagao T., Hojo T. "A clinical trial of Curative Surgery under Local Anesthesia for Early Breast Cancer" The Breast Journal, volume 18, number 2, 2012 195-197

 doi:10.20944/preprints202409.2218.v

11. Galimberti V, Cole BF, Zurrida S, Viale G, Luini A, Veronesi P, Baratella P, Chifu C, Sargenti M, Intra M, Gentilini O, Mastropasqua MG, Mazzarol G, Massarut S, Garbay JR, Zgajnar J, Galatius H, Recalcati A, Littlejohn D, Bamert M, Colleoni M, Price KN, Regan MM, Goldhirsch A, Coates AS, Gelber RD, Veronesi U. "Axillary dissection versus no axillary dissection in patients with sentinel-node micrometastases (IBCSG 23-01): a phase 3 randomised controlled trial". Lancet Oncol. 2013 Apr;14(4):297-305
12. Reimer T. "Omission of axillary sentinel lymph node biopsy in early invasive breast cancer". Breast. 2023 Feb; 67:124-128
13. Garcia-Vilanova Comas A, Nadal Gisbert J, Santofimia Chordá R, Fuster Diana C, de Andrés Gómez A, Medrano González J, Gumbau Puchol V, Zaragoza Fernández C. "Major ambulatory surgery in breast diseases". Cir Esp (Engl Ed). 2020 Jan;98(1):26-35
14. Osório F, Hipólito-Reis H, Almeida P, Mourão J, Fougo JL. "Same-day discharge pathway for breast cancer surgery in patients aged over 80: A feasibility study". J Geriatr Oncol. 2023 Jun;14(5):101518. Erratum in: J Geriatr Oncol. 2023 Jul;14(6):101563