

Subcutaneous Quadrantectomy Is A Safe Procedure in Management of Early Stage Breast Cancer.

Eva Lieto (✉ eva.lieto@unicampania.it)

Università degli Studi della Campania Luigi Vanvitelli <https://orcid.org/0000-0001-6494-237X>

Annamaria Auricchio

University of Campania Luigi Vanvitelli: Università degli Studi della Campania Luigi Vanvitelli

Silvia Erario

University of Campania Luigi Vanvitelli: Università degli Studi della Campania Luigi Vanvitelli

Giovanni Del Sorbo

University of Campania Luigi Vanvitelli: Università degli Studi della Campania Luigi Vanvitelli

Francesca Cardella

University of Campania Luigi Vanvitelli: Università degli Studi della Campania Luigi Vanvitelli

Research Article

Keywords: Breast Conservative Surgery, Breast Cancer, Subcutaneous Quadrantectomy.

Posted Date: September 23rd, 2021

DOI: <https://doi.org/10.21203/rs.3.rs-892576/v1>

License:   This work is licensed under a Creative Commons Attribution 4.0 International License.

[Read Full License](#)

Version of Record: A version of this preprint was published at Frontiers in Surgery on April 15th, 2022. See the published version at <https://doi.org/10.3389/fsurg.2022.829975>.

Abstract

Background: Surgical treatment of breast cancer, the most frequent cancer in women, is deeply changed in the last years turning towards a progressive minimally invasion, both in extend of demolition and in axillary dissection completeness. This is due to the flexibility of the concept of radicality that today is taylored on the patient, rather than on the disease; If oncologic radicality is preserved, a less invasive operation on the breast is mandatory. In the era of mini-invasive surgery, a patient may ask for an aesthetic care without any additional health risk.

Methods: In this article, we compared two groups of 75 consecutive patients undergoing conservative surgery for early stage breast cancer; the two groups were randomized for standard quadrantectomy and totally subcutaneous quadrantectomy. Statistical analysis was carried out for comparing data.

Results: No difference in oncologic outcome was found with the different surgical procedures; the length of hospital stay and the incidence of late breast deformities were significantly less in subcutaneous quadrantectomy group.

Conclusions: We conclude that, in early breast cancer, a totally subcutaneous surgical procedure of resection is feasible and safe and ensures an absolutely better aesthetical result, that involves patient's quality of life.

Background

Breast cancer is the most frequent cancer in women with a whole estimated incidence of 255.000 new cases per year, in the USA¹; mortality rate is declining in the last two decades with a specific survival rate ranging from 74–82%.

These encouraging results are due either to effective population screening programs and to the huge progress in cancer therapy and management², especially among young women.

Since its high incidence, breast cancer is a real public health issue, consuming about 13% of the total cancer healthcare cost³. This is the reason why many efforts are made nowadays to improve clinical results, with the same effectiveness, also in terms of reduction of hospitalization and request of further surgical appeals.

The concept of radicality in breast cancer has been deeply modified in the last years, going through widely demolitive interventions towards a breast conservative surgery^{4,5}; also the axillary approach has changed in the same time, being axillary dissection a need and not a choice, today⁶.

In the era of mininvasive surgery, safety and aesthetic outcome can walk together in order to ensure the patient a good oncologic result and a good quality of life.

Due to the diffusion of screening programs a large number of early breast cancers are diagnosed today; consequently a less invasive radical surgery is mandatory. Subcutaneous endoscopic mastectomy⁷ is one of the current challenge in that type of surgery, even if it takes more time to finally standardize the technique.

When breast cancer is finally encompassed into the mammalian gland, its radical removal is possible by a glandular quadrantectomy along an avascular plane with subcutaneous layer, through a small periareolar skin incision. We propose herein the results of totally subcutaneous quadrantectomy (TSQ) in comparison with standard quadrantectomy (SQ) in early stage breast cancer, in terms of overall survival (OS) and disease free survival (DFS).

Materials And Methods

a. Patients:

From 2017 to 2020, 75 early stage (T1/T2-N0) breast cancer patients were surgically treated in a single Center Unit of the Vanvitelli University of Campania.

Inclusion criteria were represented by histologically proven breast cancer, tumor size ranging between < 1 cm to 3 cm, non metastatic sentinel node status, peripheral (non retroareolar) position of the tumor into the breast, absence of surrounding tissues tumoral spreading signs.

All patients were staged as follows: anamnesis and clinical examination, mammography, breast/axillary ultrasonography, FNAB/core biopsy of the tumor, chest radiography, liver ultrasonography, whole body scintigraphy, in order to confirm early stage breast cancer; more sensitive imaging techniques, such as chest/abdomen CT scan and/or MRI were used in doubtful cases.

All patients gave their informed consent and they were aware to undergo one of two surgical procedures. The study was approved by the Ethical Committee of Vanvitelli University.

b. Surgical Procedure:

All operations were performed under general anesthesia. All patients initially underwent sentinel node biopsy (SNB): as usually, a ⁹⁹Tc labeled human serum albumin lymphoscintigraphy is carried out 3 hours before surgery and position of sentinel node is signed over the skin; harvesting of sentinel node/s is performed with the aim of an intraoperative handheld gamma-detection probe and sample is extemporary examined; cases of metastatic sentinel nodes, in which axillary dissection was required, were excluded from this study.

Randomization was performed opening a closed envelope in operating theatre unequivocally assigning the patient to undergo SQ or TSQ.

SQ was done through an elliptical skin incision in correspondence of the interested quadrant and subsequently removing an entire segment including skin, subcutaneous layer, mammalian gland and corresponding pectoral fascia.

TSQ was conversely performed through a 2 cm periareolar incision at the tumor position into the breast. A completely avascular plane is to be found between gland capsule and subcutaneous layer, so that this one is spared for a better aesthetical result. Quadrantectomy is then performed as usually, reconstructing the remnant gland thereafter.

Drainages were never used in both groups and only a compressive bandage is left in place at the end of the operation; all patients were advised to use a compressive bra for almost 2 weeks.

c. Statistical Analysis

Statistical analyses were carried out using the SPSS 20.0 software (SPSS Inc., Chicago, IL, USA).

Continuous data are expressed as range, and mean \pm standard deviation values. The equality of group means was analyzed by unpaired Student's t test. The chi-square test was used to analyze correlations between categorical variables. The Kaplan-Meier method and long-rank test were used to compare survival curves. Overall survival (OS) rate was calculated from the date of surgery to the end of follow-up or death for any cause. On the contrary, disease-free survival (DFS) rate was calculated from the date of surgery to the date of tumor relapse by censoring died patients for causes other than breast cancer. All analyses were two-sided; $p < 0.05$ was considered to be statistically significant.

Results

According to the randomization 38 patients were assigned to SQ (group A), with full thickness tissue removal, and 37 patients underwent TSQ (group B), in which resection was only limited to the gland, respectively. All operations were successful without need to change the programmed technique.

The two groups matched well; particularly they did not show any difference in size, node metastasis, radicality, postoperative complications, and hormone receptor and HER-2 status (Table 1). On the contrary, patients undergoing SQ experienced a more significant number of breast deformity than patients undergoing TSQ (31% vs 3%).

All non-surgical complications were treated conservatively with antibiotics, and multiple collection drainages. Interestingly, in group A, 5 out 12 scar retractions with breast deformity required further corrective operation.

After surgery, all patients underwent local radiotherapy and were given with hormone therapy when required.

No patient was lost to the follow-up and it was completed on June 30, 2021. There was no difference in oncological outcome in both groups. The 5-ys actuarial overall survival rates were 98 and 97%, group A

and B, respectively. The 5-ys disease-free survival rates were 92 and 95%, respectively. One patient in each group (2.6 and 2.7%, respectively) died of breast cancer.

Hospital stay and breast deformity were significantly different in the two groups, with $p < 0.001$.

Discussion

A less invasive surgery is one of the principal aims of the current practice in order to issue the same result in terms of radicality with a minimum discomfort for the patient.

Recent history of breast cancer surgery follows this line, since it is well known today that breast conservative surgery is completely stackable to more demolitive surgical interventions in terms of oncologic radicality and life expectation.

The effectiveness and safety of a subcutaneous surgery, limited to the mammalian gland, arises from the experience in skin-sparing and nipple-sparing mastectomy, with immediate prosthetic replacement, both in profilactic and curative setting. When tumor is completely contained into the capsule, a TSQ is as curative as a SQ with surely better functional and aesthetical results. In early stage breast cancers, often arising in young women, we retain a mini-invasive surgery should be given without compromising any long-term result.

Furthermore, more often SQ can be complicated by retracting scars, involving different tissue layers, with disfiguring modifications in the breast shape. TSQ instead, since the integrity of the integuments at the site of glandular resection, doesn't complicate with a retracting scar; we only observed 1 case of breast deformity due to glandular unstitching in early postoperative period after wound infection. In most cases imperceptible changes have been observed in breast profile due to reduction of the gland volume rather than scarring deformities (Fig. 1).

Conclusions

In the small series we have analyzed, OS and DFS are quite the same, with non significant variations, in both groups. Early complications were not significantly different between the two groups. On the contrary, late complications, such as scar retracting often requiring re-operation, were definitely lower in TSQ group than in SQ group, with a better aesthetical result; moreover, any re-operation has been performed in TSQ group with sensible money saving in terms of hospitalization and resumption of the patient's normal activities.

In conclusion, despite the smallness of the sample, subcutaneous quadrantectomy is a safe procedure in breast cancer management, and is strongly recommended in young women in which aesthetical result is mandatory to ensure them a good quality of life.

Abbreviations

- SQ
- Standard Quadrantectomy
- TSQ
- Totally Subcutaneous Quadrantectomy
- SNB
- Sentinel Lymph-node biopsy
- OS
- Overall Survival
- DFS
- Disease Free Survival

Declarations

- **ETHICS APPROVAL AND CONSENT:** The Ethic Committee of University of Campania Luigi Vanvitelli approved the present study (208/21)
- **CONSENT FOR PUBLICATION:** All Authors gave their consent for publication of the present article
- **AVAILABILITY OF DATA AND MATERIALS:** Not applicable
- **COMPETING INTEREST:** The Authors declare no competing interests
- **FUNDING:** The Authors declare that no funding has been received
- **AUTHORS CONTRIBUTION:** Design and Revision: EL and AA ; Data Interpretation: FC; Data Acquisition: SE, GDS
- **AKNOWLEDGMENTS:** A special thanks to Prof. Gennaro Galizia for statistical revision.

References

1. United States Cancer Statistics. www.cdc.gov.
2. Carioli C, Malvezzi M, Rodriguez T, Bertuccio P, Negri E, La Vecchia C. Trends and prediction to 2020 in breast cancer mortality in Europe. *Breast*. 2017;36:89–95.
3. Luengo-Fernandez R, Leal J, Gray A, Sullivan R. Economic burden of cancer across the European Union: a population-based cost analysis. *Lancet Oncol*. 2013;14(12):1165–74.
4. Halsted WS. A clinical and histological study of certain adenocarcinomata of the breast and a brief consideration of the supraclavicular operation and the results of operation for cancer of the breast from 1889 to 1898 at the John Hopkins Hospital. *Ann Surg* 1898; 28: 557–576.
5. Veronesi U, Saccozzi R, Del Vecchio M, et al. Comparing radical mastectomy with quadrantectomy, axillary dissection and radiotherapy in patients with small cancers of the breast. *N Engl J Med*. 1981;305:6–11.
6. Galimberti V, Cole BF, Viale G, et al. Axillary dissection versus no axillary dissection in patients with breast cancer and sentinel-node micrometastases (IBCSG 23 – 01): 10-year follow up of randomized,

controlled phase 3 trial. *Lancet Oncol.* 2018;19(10):1385–93.

7. Varlet F, Raia-Barjat T, Bustangi N, Vermersch S, Scalabre A. Treatment of gynaecomastia by endoscopic subcutaneous mastectomy in adolescents. *J Laparoendosc Adv Surg Tech A.* 2019;29(8):1073–6.

Tables

Table 1 is not available with this version.

Figures

A



B

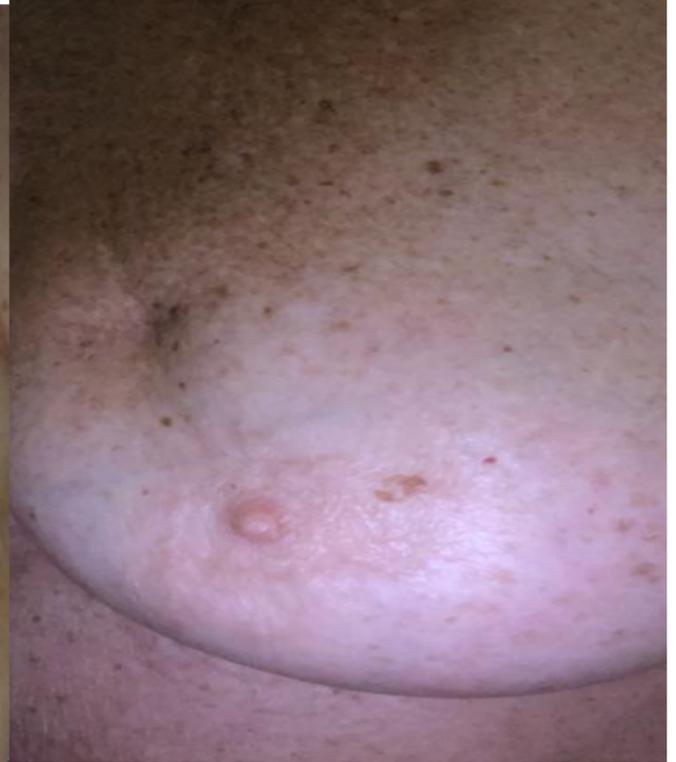


Figure 1

Upper-external quadrantectomy: long-term results. A- TSQ: The scar is near the areola with minimal alteration of the breast shape. B- SQ: The scar is into the quadrant with minimal retraction in the middle third.