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Evaluation of validity of axillary berry picking in breast cancer patients

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Abstract

Axillary lymph node status is a significant prognostic pathologic variable in patients with operable breast cancer. the number of lymph nodes with metastasis also has prognostic importance. To evaluate possibility of intra operative ultrasound- guided berry picking of axillary lymph nodes in providing satisfactory axillary staging for breast cancer. This would aim finally as to recommend the procedure and avoid axillary lymph node dissection (ALND) in all or selected cancer patients. This randomized controlled study was conducted on thirty women who were candidates for ALND at Kasr Al-Ainy Teaching Hospitals, Faculty of Medicine, Cairo University between September 2018 and March 2020. ER, PR and Her 2neu status of study group patients and receiving neo adjuvant chemotherapy or not didn't affect significantly on false positive rate or the false negative rate of intra operative ultrasound. In luminal A and luminal B patient, P value was non-significant (> 0.05) regarding false positive rate or false negative rate of intra operative ultrasound. The use of intra operative ultrasound guided axillary berry picking as a tailored procedure in clinically node positive patients in early breast cancer will avoid surgical overtreatment by selectively removing the lymph nodes that are affected by the cancer, thereby sparing many patients the unnecessary complications of a radical surgery, providing a better quality of life while keeping the same efficacy.

Keywords: Axillary berry picking, Breast cancer, Axillary lymph node dissection.

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1. Introduction

The management of the axilla in breast cancer has been changing significantly in recent years. The concept of conservation, which has been applied to the breast, now also involves the axillary lymph nodes [1]. Along with modifications in treatment of primary breast cancer, the purpose and extent of lymph node dissection has changed. Today, axillary lymph node dissection (ALND) is just meant for staging and has no therapeutic role. From here started the idea of sentinel lymph node dissection (SLND). With sentinel node procedure it is possible to make accurate staging of the axilla without morbidity of axillary clearance in patients with negative axilla [2]. Axillary lymph node status is a significant prognostic pathologic variable in patients with operable breast cancer. the number of lymph nodes with metastasis also has prognostic importance [3]. Ultrasound can be utilized to image the regional lymph nodes in patients with breast cancer. It is non-invasive and inexpensive method to detect significant nodal disease. It does not been influenced by tumor histology nor by patients' factors such as body mass index [4]. Imaging features of benign lymph nodes include oval shape, lobulated contour, well defined margins and thin cortex. Morphologic findings suggesting lymph node metastasis include diffuse or eccentric cortical thickening, hilar changes of displacement, compression or effacement [5-7]. The aim of this study was to evaluate possibility of intra operative ultrasound- guided berry picking of axillary lymph nodes in providing satisfactory axillary staging for breast cancer. This would aim finally as to recommend the procedure and avoid ALND in all or selected cancer patients.

2. Patients and methods

This randomized controlled study was conducted on thirty women who were candidates for ALND at Kasr Al-Ainy Teaching Hospitals, Faculty of Medicine, Cairo University between September 2018 and March 2020. The study protocol was reviewed and duly permitted by the institutional research ethics committee.

2.1. Inclusion criteria

Patients with T1-3 breast cancer, N1 and M0 breast cancer.

2.2. Exclusion criteria

T4 patients**,** patients with N0 or N2 breast cancer and metastatic breast cancer (M1).

2.3. Methods

All patients with operable breast cancer with clinically/ultrasonographically positive axilla who were candidate for ALND presenting to the department were subjected to the following: Full history taking, general and local examination, bilateral sonomammography, MRI if indicated, preoperative tissue core biopsy was done to confirm diagnosis and IH4 status.

2.3.1. Operative procedure involved

Axillary exposure via classic approach. Full exposure of axillary vein and interpectoral lymph nodes. Manual palpation of lymph nodes to detect grossly pathological ones. The patient data was thereafter presented at the weekly MDT clinic in the Oncology Department in Kasr Al-Ainy Hospital where Surgical Oncology, Medical Oncology, Radiotherapy, Radiology and Pathology Consultants discuss the results of the investigations. Intra operative ultrasound using Siemens Acusonx300 with 2 probes (p CH5-2, pVF13-5). Systematic screening of axilla to detect pathological nodes was done using ultrasound. Lymph nodes detected to be pathological by intra operative ultrasound were removed in separate group and then reevaluated Ex- vivo to confirm identity. Procedure was repeated till all pathological lymph nodes were removed. This was followed by ALND.

2.3.2. Postoperative Pathological evaluation of residual lymph nodes (undetected by ultrasound) to evaluate

Number of positive lymph nodes involved and grade of involvement (staging of lymph nodes).

2.3.3. Pathological evaluation of ultrasound retrieved pathological lymph nodes to evaluate

Number of positive lymph nodes involved and Grade of involvement (staging of lymph nodes)

2.4. Statistical analysis

Analysis of data was done by IBM computer using SPSS (statistical program for social science version 21) as follows: Description of quantitative variables as mean, SD, median and IQR for quantitative variables. Description of qualitative variables as number and percent. Mann Whitney test was used instead of independent t-test. Data were statistically described in terms of mean±standard deviation (± SD), median and range, or frequencies (number of cases) and percentages when appropriate. Numerical data were tested for the normal assumption using Kolmogorov Smirnov test. Comparison of numerical variables between the study groups was done using Mann Whitney *U* test for independent samples. Correlation between various variables was done using Pearson moment correlation equation for linear relation of normally distributed variables and Spearman rank correlation equation for non-normal variables/non-linear monotonic relation. Two sided *p* values less than 0.05 was considered statistically significant. $P \leq 0.05$ significant, $P < 0.01$ highly significant.

3. Results and Discussion

Our results showed that the mean of age in study group was 53.1±7.1. Eleven (11) patients (63.3%) received neo-adjuvant chemotherapy while 19 (37.7 %) patients didn't receive neo-adjuvant chemotherapy. ER, PR and Her 2neu status of study group patients and receiving neo adjuvant chemotherapy or not didn't affect significantly on false positive rate or the false negative rate of intra operative ultrasound. In luminal A and luminal B patient, P value was non-significant (> 0.05) regarding false positive rate or false negative rate of intra operative ultrasound. In **Agresti R** study, it has been found that many patients undergoing ALND in clinically node-positive patients , the number of negative lymph nodes removed exceeds the number of tumor-affected nodes. From here started the idea of our study aiming to avoid ALND and it's morbidity in clinically node-positive patients with early breast cancer. This idea is to do intra operative ultrasound guided axillary berry picking in patients who are candidate for ALND [8]. Staging of the axilla is an important step in the treatment of breast carcinoma. Axillary lymph node status is a significant prognostic pathologic variable in patients with operable primary breast cancer, and it remains the most powerful predictor of recurrence and survival. Axillary dissection (ALND) was the standard approach, but now, sentinel node biopsy (SLNB) alone, SLNB plus nodal radiotherapy, and neoadjuvant chemotherapy are all alternatives supported by evidence [9]. This viewpoint will review the data informing patient selection for each of these approaches with the goal of minimizing the use of ALND and its associated morbidity. Anegative physical examination of the axilla is sufficient to identify patients who are candidates for axillary staging with SLNB .The sentinel lymph node biopsy (SLNB) procedure was initially proposed as a less-invasive alternative to ALND for axillary staging in patients with early-stage breast cancer. Since the introduction of the procedure, many studies have demonstrated its accuracy in axillary staging as well as its ability to achieve regional control in patients with clinically node-negative disease. Following the publication of multiple trials to this effect, SLNB has become the preferred method for axillary staging in the clinically node-negative patient population [10]. SLNB, originally introduced by Morton and colleagues in melanoma patients with clinically negative nodes, is an alternative to the use of complete resection of the nodal basin to assess the possibility of nodal involvement. Although the initial study described use of blue dye alone, Morton later described a dual-tracer technique to identify those nodes most likely to contain metastasis owing to direct lymphatic drainage from the primary tumor. This technique has been expanded for use in multiple other solid tumor malignancies, most notably breast cancer [10].

Table 1: Neoadjuvant chemotherapy in study group

Age (mean)	53.1±7.1	
Neoadjuvant chemotherapy	frequency	percent
Yes	11	63.3%
No	19	37.7%
Total	30	100 %

Table 2: Relation between mean of false positive picked lymph nodes, false negative residual lymph nodes to ER status of study group patients

	Mean of false positive picked lymph nodes	**Mean of false negative residual lymph nodes**
ER		
positive	37.38	1.02
negative	54.68	0.0
P value	0.287	0.204

Table 3: Relation between mean of false positive picked lymph nodes, false negative residual lymph nodes to PR status of study group patients

	Mean of false positive picked lymph nodes	**Mean of false negative residual lymph nodes**
PR		
Positive	39.13	0.0
Negative	48.61	1.07
P value	0.615	0.168

Table 4: Relation between mean of false positive picked lymph nodes, false negative residual lymph nodes to Her2 neu status of study group patients

	Mean of false positive picked lymph nodes	**Mean of false negative residual lymph nodes**
Her2 neu		
positive	31.75	0.56
negative	46.38	0.83
P value	0.315	0.789

Table 5: Relation between mean of false positive picked lymph nodes, false negative residual lymph nodes to neo adjuvant chemotherapy of study group patients

	Mean of false positive picked lymph nodes	**Mean of false negative residual lymph nodes**
Neo adjuvant chemotherapy		
yes	56.44	1.08
No	33.60	0.56
P value	0.099	0.560

Table 6: Relation between mean of false positive picked lymph nodes, false negative residual lymph nodes to luminal A patients of study group

	Mean of false positive picked lymph nodes	Mean of false negative residual lymph nodes
luminal A	41.26	1.34
P value	0.983	0.167

Table 7: Relation between mean of false positive picked lymph nodes, false negative residual lymph nodes to luminal B patients of study group

	Mean of false positive picked lymph nodes	Mean of false negative residual lymph nodes
luminal B	31.71	0.56
P value	0.315	0.789

For those patients who present with initially node-positive disease, there has been concern that SLNB is not accurate for axillary staging following chemotherapy. The initial studies exploring SLNB in this patient population were small, single-institution studies that did not require a standard approach to the sentinel node procedure or the pathologic assessment of the sentinel nodes. Early reports had relatively high false-negative rates, but also had wide variation in the surgical techniques that were used and the patient populations that were included. Several groups advocated for the use of SLNB prior to chemotherapy, whereas others advocated for SLNB after chemotherapy to reduce the number of axillary dissections needed in those with clinically node-positive disease downstaged with systemic therapy [12]. Table 1 showed that, the mean of age in study group was 53.1±7.1. Eleven (11) patients (63.3%) received neoadjuvant chemotherapy while 19 (37.7 %) patients didn't receive neoadjuvant chemotherapy. Table 2 showed that ER status of study group patients didn't affect significantly on false positive rate or the false negative rate of intra operative ultrasound. Table 3 showed that PR status of study group patients didn't affect significantly on false positive rate or false negative rate of intra operative ultrasound. Table 4 showed that Her 2neu status of study group patients didn't affect significantly on false positive rate or false negative rate of intra operative ultrasound. Table 5 showed that whether receiving neo adjuvant chemotherapy or not in study group patients didn't affect significantly on false positive rate or false negative rate of intra operative ultrasound. In luminal A patient, P value was non-significant (> 0.05) regarding false positive rate or false negative rate of intra operative ultrasound (Table 6). Table 7 showed that in luminal B patients, P value was non-significant (> 0.05).

4. Conclusions

The use of intra operative ultrasound guided axillary berry picking as a tailored procedure in clinically node positive patients in early breast cancer will avoid surgical overtreatment by selectively removing the lymph nodes that are affected by the cancer, thereby sparing many patients the unnecessary complications of a radical surgery, providing a better quality of life while keeping the same efficacy. The use of axillary berry picking will explore the evolution of management of the axilla in patients with node-positive disease and will provide insights into future directions in breast cancer.

References

[1] D. McCready, C. Holloway, W. Shelley, N. Down, P. Robinson, S. Sinclair, D. Mirsky, Breast Cancer Disease Site Group of Cancer Care Ontario's Program in Evidence-Based Care. (2005). Surgical management of early-stage invasive breast cancer: a practice guideline. Canadian Journal of Surgery. 48(3): 185.

[2] A. Piñero-Madrona, F. Ripoll-Orts, J.I. Sánchez-Méndez, A. Chaves-Benito, M.R. Gómez-de la Bárcena, A. Calatrava-Fons, S. Menjón-Beltrán, V. Peg-Cámara. (2020). External validation of a prognostic model based on total tumor load of sentinel lymph node for early breast cancer patients. Breast Cancer Research and Treatment. 181: 339-345.

[3] M. Intra, S. Zurrida, F. Maffini, A. Sonzogni, G. Trifirò, R. Gennari, P. Arnone, G. Bassani, A. Opazo, G. Paganelli. (2003). Sentinel lymph node metastasis in microinvasive breast cancer. Annals of surgical oncology. 10: 1160-1165.

[4] I. Skarping, D. Förnvik, S. Zackrisson, S. Borgquist, L. Rydén. (2021). Predicting pathological axillary lymph node status with ultrasound following neoadjuvant therapy for breast cancer. Breast Cancer Research and Treatment. 189(1): 131-144.

[5] J.S. Ecanow, H. Abe, G.M. Newstead, D.B. Ecanow, J.M. Jeske. (2013). Axillary staging of breast cancer: what the radiologist should know. Radiographics. 33(6): 1589-1612.

[6] D.B. Kopans. (2007). Breast imaging. Lippincott Williams & Wilkins: pp.

[7] S. Rautiainen. (2015). Preoperative Axillary Staging in Invasive Breast Cancer (Doctoral dissertation, Itä-Suomen yliopisto).

[8] R. Agresti, G. Martelli, M. Sandri, E. Tagliabue, M.L. Carcangiu, I. Maugeri, C. Pellitteri, C. Ferraris, G. Capri, A. Moliterni. (2014). Axillary lymph node dissection versus no dissection in patients with T1N0 breast cancer: a randomized clinical trial (INT09/98). Cancer. 120(6): 885-893.

[9] A.E. Giuliano, K.K. Hunt, K.V. Ballman, P.D. Beitsch, P.W. Whitworth, P.W. Blumencranz, A.M. Leitch, S. Saha, L.M. McCall, M. Morrow. (2011). Axillary dissection vs no axillary dissection in women with invasive breast cancer and sentinel node metastasis: a randomized clinical trial. Jama. 305(6): 569-575.

[10] M. Pilewskie, M. Jochelson, J.C. Gooch, S. Patil, M. Stempel, M. Morrow. (2016). Is preoperative axillary imaging beneficial in identifying clinically node-negative patients requiring axillary lymph node dissection? Journal of the American College of Surgeons. 222(2): 138-145.

[11] D.L. Morton, J.F. Thompson, A.J. Cochran, N. Mozzillo, R. Elashoff, R. Essner, O.E. Nieweg, D.F. Roses, H.J. Hoekstra, C.P. Karakousis. (2006). Sentinel-node biopsy or nodal observation in melanoma. New England Journal of Medicine. 355(13): 1307-1317.

[12] T. Kuehn, I. Bauerfeind, T. Fehm, B. Fleige, M. Hausschild, G. Helms, A. Lebeau, C. Liedtke, G. von Minckwitz, V. Nekljudova. (2013). Sentinel-lymph-node biopsy in patients with breast cancer before and after neoadjuvant chemotherapy (SENTINA): a prospective, multicentre cohort study. The lancet oncology. 14(7): 609-618.