Significance of Metastatic Positive Lateral Group of Lymph Nodes in Patients Undergoing Axillary Dissection for Breast Carcinoma

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ABSTRACT

Background: *Axillary surgery has revolutionized in recent years with the use of sentinel node biopsy to assess axillary node involvement, thus preventing patients from undergoing unnecessary axillary clearance, which can be associated with morbidities.* ***Subjects & Methods:*** *this study was conducted on 50 cases; during either conservative breast surgery or modified radical mastectomy, the lateral group of axillary nodes (lying lateral to the thoracodorsal pedicle) was sent separately for pathological assessment (paraffin).* ***Results:*** *Our study is Descriptive Prospective Study conducted on 50 female patients with breast cancer, surgeries were done at Ain Shams and Aswan universities' Hospitals from 2018 to 2019. The lateral group axillary LNs were separately resected and sent for pathological examination together with the rest of resected specimen. Patients underwent complete ALND at the time of definitive surgery.* ***Conclusion:*** *Surgical resection is the mainstay of treatment of non-metastatic breast cancer, and complete surgical resection is necessary for optimal local control. In a lower middle income country like Egypt, there is late stage at presentation and a higher incidence of axillary nodal involvement. We recommend routine axillary clearance up including the lateral group in node-positive axilla, especially when multiple lower-level axillary nodes are involved while in node negative lower level axillary nodes the lateral group should not be included in dissection, this will reduce postoperative complications, especially lymphedema of upper limb. However, more studies on more number of patients are required for proper statistical significance.*

Key words: *Breast cancer, lateral group of axillary LN, Axillary LN, post axillary LN dissection complications, anatomy of the breast.*

PATIENTS AND METHODS

Type of the study:

A prospective cohort study. Patients diagnosed with breast cancer undergoing surgery with axillary dissection; pathological axillary nodes by PHYSICAL OR U/S examination.

Study period:

Conducted over **6** months from 2018 to 2019.

Study population:

Inclusion criteria: all patients diagnosed with breast cancer treated primarily with surgery.

Exclusion criteria:

1. Male patients
2. Patients undergoing surgery after neo adjuvant chemotherapy
3. Any previous breast or axillary surgery.

Sampling method: female patients diagnosed with operable breast cancer.

Sample size: 50 cases.

Ethical considerations: written informed consent was explained and signed by each patient before the surgical procedure.

Study procedure: during either conservative breast surgery or modified radical mastectomy, the lateral group of axillary nodes (lying lateral to the thoracodorsal pedicle) was sent separately for pathological assessment.

Statistical analysis:

Baseline clinico-pathologic factors of the cohort were reported as numbers and percentage. Univariate analysis was performed using Pearson chi-square or Fisher's exact test to look for relation between presence of positivity in lateral LN group and other groups. A test was statistically significant if the two-sided P value

was ≤ .05. Data were analyzed using SPSS version 22.0 (IBM) for Windows.

Axillary Dissection:

Patients with clinico-radiologic positive ALNs or positive nodes on intra-operative axillary sampling underwent removal of level I to III ALNs up to the costoclavicular ligament of Halsted. Lateral group of axillary lymph nodes were removed and sent separately.

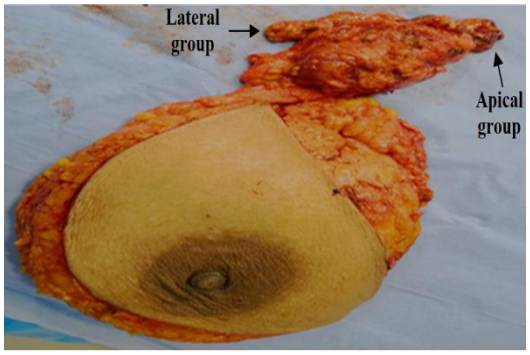

Fig. (1): Right modified radical mastectomy.

RESULTS

Our study is Descriptive Prospective Study conducted on 50 female patients with breast cancer, surgeries were done at Ain Shams and Aswan universities' Hospitals from 2018 to 2019. The lateral group axillary LNs were separately resected and sent for pathological examination together with the rest of resected specimen. Patients underwent complete ALND at the time of definitive surgery.

Patients' ages ranged from 37 to 70 years old with mean age 54 years with 7 years standard deviation, distribution of patients in different age groups is presented in, Fig.(2).

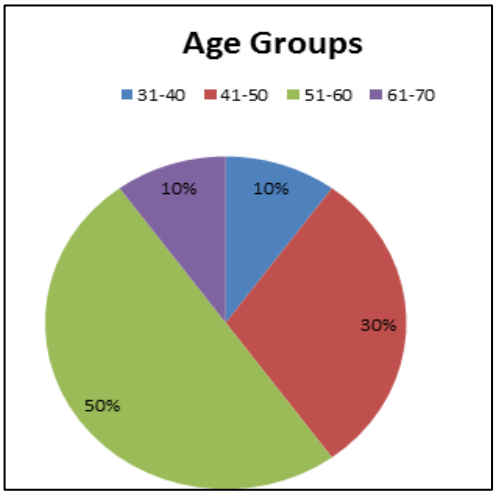

Fig. (2): Pie chart presenting the distribution of age groups in studied patients

CLINICAL PRESENTATION:

Table (1): Descriptive statistics of the mass by correlated clinical and radiological data:

Examination data		**Study sample (n = 50) (100%)**
Clinical examination	Single mass (n, %)	**40 (80%)**
	Multiple masses (n, %)	**10 (20%)**
Breast examination (side)	Right breast (n, %)	**33 (66%)**
	Left breast (n, %)	**17 (34%)**
Clinical examination (size)	< 2 cm (n, %)	**10 (20%)**
	(2 - 5) cm (n, %)	**40 (80%)**
Breast examination (site)	UOQ (n, %)	**38 (76%)**
	LOQ (n, %)	**5 (10 %)**
	UIQ (n, %)	**5 (10%)**
	LIQ (n, %)	**2 (4%)**
	Retro areolar (n, %)	-
	Axillary tail (n, %)	-
L.N examination (clinically)	N0 (n, %)	-
	N1 (n, %)	**50 (100%)**
L.N examination (radiological)	Suspicious (n, %)	**50(100%)**
	Nonspecific (n, %)	-

The 50 female patients presented to us by unilateral breast tumor, 33 (66%) masses were located in the right breast, 17 (34%) masses were located in the left breast. The commonest site of breast tumor in studied cases was UOQ in 38 patients representing 76% of the cases.

All tumors were of grade II except one that was grade III. The histopathology of 50 primary breast tumors was invasive ductal carcinoma confirmed pre-operatively by tru cut and by Histopathological post-operative examination. The measurements of tumors established by means of radiological examination were between 1.5 and 5.0 cm (stageT1 and T2).

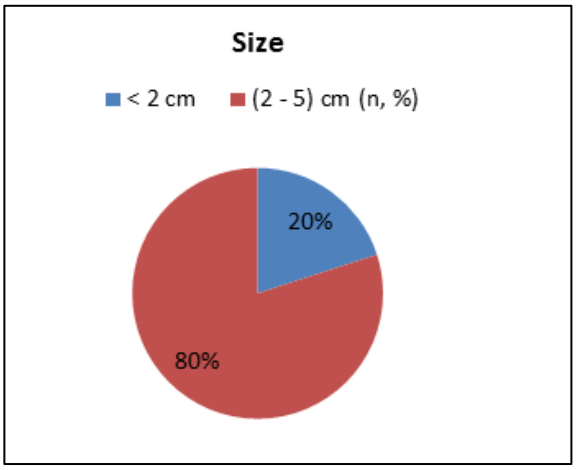

Fig. (3): Pie chart presenting size of tumors in the studied group

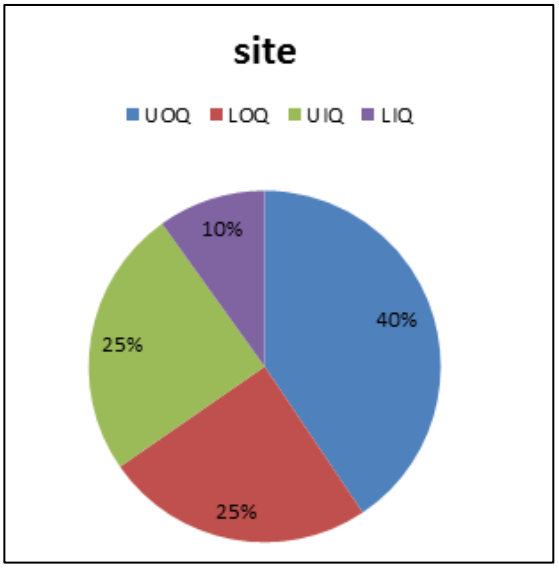

Fig. (4): Pie chart presenting site of tumor in the studied group

Imaging evaluation:

Table (2): Descriptive statistics of radiological examination of axillary LNs.

Radiological data		**Study sample (n = 50) (100%)**
Axillary L.N	Multiple L.N (n, %)	**40 (80%)**
	Single L.N (n, %)	**10 (20%)**
Shape	Oval	**33 (66%)**
	Rounded (n, %)	**17 (34%)**
Cortical thickness* (mm) Mean ± SD (range)	**5.33 ± 3.22 (3-15)**	*n=38
	12 patients had lost hilum and cortical thickness was 0	
Hilum	Preserved (n, %)	**5 (10%)**
	Eccentric (n, %)	**33 (66%)**
	Lost (n, %)	**12 (24%)**
Size of largest L.N measured Radiologically	< 2 cm (n, %)	**25 (50%)**
	2-3 cm (n, %)	**20 (40%)**
	> 3 cm (n, %)	**5 (10%)**

The preoperative ultrasound assessment of breast and axilla was performed for all patients to assess the size, character and axillary LN status summarized in table (2).

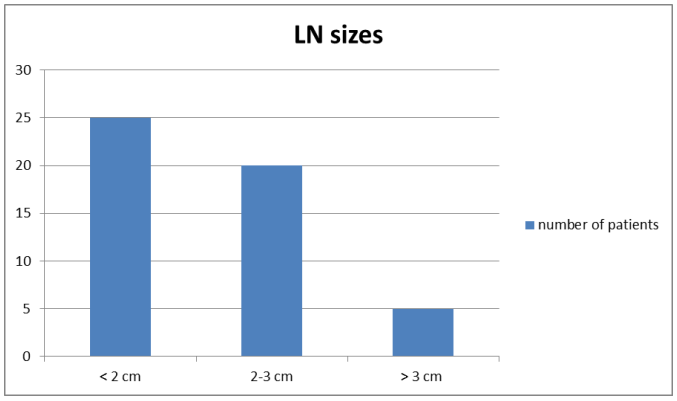

Fig. (5): Bar chart presenting L.N sizes of the studied group as described in radiological examination.

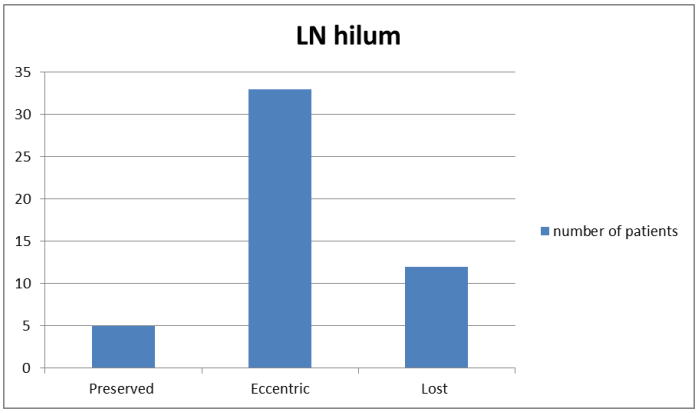

Fig. (6): Bar chart presenting L.N hilum description in the studied group as described in radiological examination

Of total 50 patients, pathological examination of axillary LNs was requested in two groups (lateral) & (other) groups; the results were as follows:

- 13 patients had metastatic positivity in both groups (lateral and others).
- 2 patients had no metastatic deposits in both groups (lateral and others).
- 3 patients had metastatic positivity in the lateral group of LNs only.
- 32 patients had metastatic positivity in other groups (p-value = 0.03).

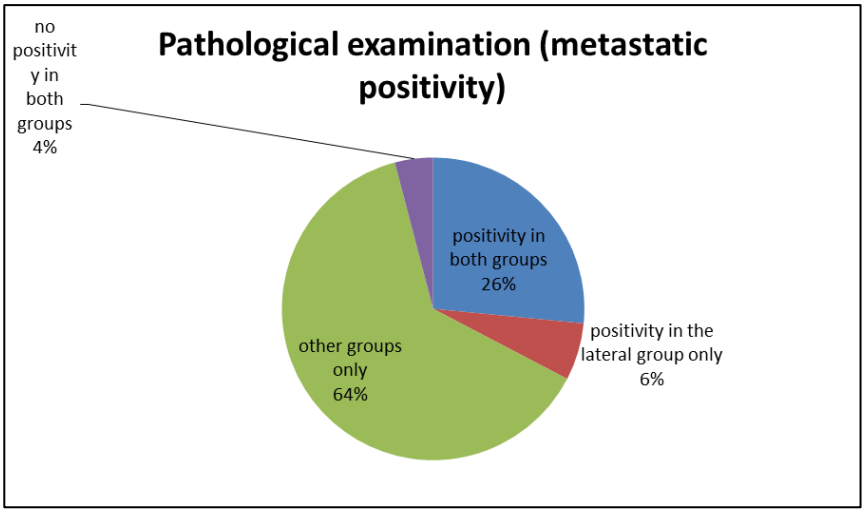

Fig. (7): Descriptive statistics of pathological examination results for LNs (lateral & other groups).

Table (3): Descriptive statistics of postoperative pathology results data:

Postoperative pathology data	**Study sample (n = 50) (100%)**	
Pathological type		
IDC (n, %)	**50 (100%)**	
L.N staging after surgery		
N1 (n, %)	**48**	**(96%)**
N0 (n, %)	**2**	**(4%)**
Type of surgery		
BCS (n, %)	**30**	**(60%)**
MRM (n, %)	**20**	**(40%)**

DISCUSSION

Lymph node metastasis status is an important factor in the prognosis of breast cancer. Clinically evident LN affection (i.e. physical examination & radiological studies) are very essential in prediction of pathologically affected LNs. **(Akıncı et al., 2016)**.

Axillary lymph node dissection has traditionally been routine management for radical treatment. However, the anatomic disruption caused by ALND may result in infection, hematoma, seroma, lymphedema, and nerve injury, which compromise functionality and quality of life. **(Black et al., 2016)**.

In Milan, a mathematical model constructed using 1,446 patients' data predicted that to not leave behind residual disease in 90% of patients, a minimum of 10 ALNs had to be dissected. Hence, in the TNM staging, a minimum of 10 ALNs were believed to be essential for accurate staging of axilla. Physical examination of the axilla is notoriously inaccurate in staging, with a 30% false-positive rate and a 45% false-

negative rate. Avoiding complete axillary dissection is now accepted as the standard of care. **(Bromham et al., 2017)**.

The therapeutic role of axillary dissection has been questioned by many, and some authors have labeled it as only a staging procedure for prognostication and planning appropriate adjuvant therapy. **(Dialani et al., 2015).**

13 NSABP B-04 was the first randomized study that reported no survival advantage with axillary dissection. A number of other studies have suggested better local control with complete axillary dissection, which amounts to an improvement in survival. **(Pesek et al., 2012)**.

The Early Breast Cancer Trialists' Collaborative Group has reported one life saved for every four local recurrences avoided. The therapeutic advantage of complete axillary dissection in breast cancer has been proven for node-positive patients. **(Parmar et al., 2013)**.

Limited axillary surgery is acceptable only in pathologically proven node-negative axilla. In our analysis, we found that there is considerable percentage of absence of metastasis in lateral group of axillary lymph nodes, while there is positivity for other groups. However positivity of lateral group while negative rest of axilla means that there are some cases that have been missed by SLNB, but the percentage is low.

CONCLUSION

Surgical resection is the mainstay of treatment of non-metastatic breast cancer, and a complete surgical resection is necessary for optimal local control. In a lower middle income country like Egypt, there is a higher stage at presentation and a higher incidence of axillary nodal involvement. We recommend routine axillary clearance up including the lateral group in node-positive axilla, especially when multiple lower-level axillary nodes are involved while in node negative lower level axillary nodes the lateral group should not be included in dissection, this will reduce postoperative complications, especially lymphedema of upper limb. However, more studies on more number of patients are required for proper statistical significance.

REFERENCES

1. Akıncı M, Bulut SP, Erözgen F, Gürbüzel M, Gülşen G, Kocakuşak A, Gülen M, Kaplan R.Predictive value of fine needle aspiration biopsy of axillary lymph nodes in preoperative breast cancerstaging. Ulus Cerrahi Derg. 2016 Apr 6;32(3):191-6.
2. Allison KH. Molecular pathology of breast cancer: what a pathologist needs to know. Am J Clin Pathol. 2012 Dec; 138(6):770-80
3. Assi, H., Sbaity, E., Abdelsalam, M. & Shamseddine, A. Controversial indications for sentinel lymph node biopsy in breast cancer patients. Biomed Res Int 2015, 405949, 10.1155/2015/405949 (2015).
4. Atalay C.New concepts in axillary management of breast cancer. World J Clin Oncol. 2014 Dec 10;5(5):895-900.
5. Benson JR, Jatoi I.The global breast cancer burden. Future Oncol. 2012 Jun;8(6):697-702.
6. Black D. Axillary Ultrasound: For All, for None, to Diagnose Positive Nodes, or to Support Avoiding Sentinel Lymph Node Biopsy Altogether. Ann Surg Oncol. 2016 Aug 24
7. Bromham N, Schmidt-Hansen M, Astin M, et al: Axillary treatment for operable primary breast cancer. Cochrane Database Syst Rev 1:CD004561, 2017
8. Cheng YS, Kuo SJ, Chen DR1.Sparing sentinel node biopsy through axillary lymph node fine needle aspiration in primary breast cancers. World J Surg Oncol. 2013 Nov 20;11:296.
9. Dialani V, James DF, Slanetz PJ. A practical approach to imaging the axilla. Insights Imaging. 2015 Apr;6(2):217-29.
10. Galimberti V, Cole BF, Zurrida S, et al.: Axillary dissection versus no axillary dissection in patients with sentinel-node micrometastases (IBCSG 23–01): a phase 3 randomized controlled trial. Lancet Oncol 2013; 14: 297–305.
11. Gary J. Whitman, MD, Tracy J, Lu, Margaret Adejolu, MRCP, FRCR, Savitri Krishnamurthy,MD, Declan Sheppard, FRCR) Lymph node SonographyUltrasound Clin 6.(2011);369–380.

12. Giuliano AE, McCall L, Beitsch P, et al.: Locoregional recurrence after sentinel lymph node dissection with or without axillary dissection in patients with sentinel lymph node metastases: the American College of Surgeons Oncology Group Z0011 randomized trial. Ann Surg 2010; 252: 426–32.
13. Giammarile F, Alazraki N, Aarsvold JN, Audisio RA, Glass E, Grant SF, Kunikowska J, Leidenius M, Moncayo VM, Uren RF, Oyen WJG, Valdes Olmos RA, Vidal-Sicart S. The EANM and SNMMI practice guideline for lymphoscintigraphy and sentinel node localization in breast cancer. Eur J Nucl Med Mol Imaging. 2013; 40:1932–1947.
14. Gurleyik G, Gurleyik E, Aktekin A, Aker F. Preoperative assessment of the axilla by surgeon performed ultrasound and cytology in patients with breast cancer. J Clin Med Res. 2015 Jun;7(6):440-5.
15. Hayes BD, Feeley L, Quinn CM, Kennedy M, O'Doherty A, Flanagan F, O'Connell AM: Axillary fine needle aspiration cytology for pre-operative staging of patients with screen-detected invasive breast carcinoma. J Clin Pathol 2011, 64:338–342..
16. Khafagy M, Mostafa A, Fakhr I, et al: Distribution of axillary lymph node metastases in different levels and groups in breast cancer: A pathological study. J Egypt Egypt Natl Canc Inst 23:25-30, 2011
17. Koboldt DC, Fulton RS, McLellan MD, Schmidt H, Kalicki-Veizer J, McMichael JF, Comprehensive molecular portraits of human breast tumours.Cancer Genome Atlas Network. Nature. 2012 Oct 4; 490(7418):61-70.
18. Krag DN, Anderson SJ, Julian TB, et al: Sentinel-lymph-node resection compared with conventional axillary-lymph-node dissection in clinically node-negative patients with breast cancer: Overall survival findings from the NSABP B-32 randomised phase 3 trial. Lancet Oncol 11:927-933, 2010
19. Longo B, Campanale A, Farcomeni A, et al. Long-term sensory recovery of nipple-areola complex following superolateral pedicled reduction mammaplasty. Plast Reconstr Surg 2013; 132:735e-742e
20. Parmar V, Hawaldar R, Nair NS, et al: Sentinel node biopsy versus low axillary sampling in women with clinically node negative operable breast cancer. Breast 22:1081-1086, 2013
21. Pesek S, Ashikaga T, Krag LE, et al: The false-negative rate of sentinel node biopsy in patients with breast cancer: A meta-analysis. World J Surg 36:2239-2251,2012
22. Sophia K. Apple Sentinel Lymph Node in Breast Cancer: Review Article from a Pathologist's Point of ViewJ Pathol Transl Med. 2016 Mar; 50(2): 83–95. Published online 2016 Jan 12