ADEQUACY OF AXILLARY LYMPH NODE CLEARANCE IN BREAST CARCINOMA: ARE WE ACHIEVING THE RECOMMENDED STANDARDS?

Dr. Subramaniyam Raviraj, Thileebphan Balasingam

MBBS(SL), MS(SL), FCCSL, Dean, Faculty of Medicine and Senior Lecturer in Surgery, Consultant, Surgeon, Professorial Surgical Unit, Faculty of Medicine, University of Jaffna.

Article Info: Received 27 May 2019; Accepted 23 June. 2019

DOI: <https://doi.org/10.32553/ijmbs.v3i6.349>

Address for Correspondence: Dr. Subramaniyam Raviraj, Faculty of Medicine and Senior Lecturer in Surgery, Consultant, Surgeon, Professorial Surgical Unit, Faculty of Medicine, University of Jaffna.

Conflict of interest: No conflict of interest.

Abstract

Introduction: In the setup of breast cancer management, axillary lymph node clearance plays a role in staging and planning of adjuvant chemotherapy and local control of cancer. Harvesting minimum of 10 lymph nodes for histopathological analysis is cut off value to consider a 90% certainty of a true negative axillary lymph node after axillary clearance.

Aim: To assess the adequacy of axillary lymph node clearance considering influence of tumor factor (size, site, grade, type, lymphovascular invasion and hormonal and HER 2-NEU receptor status).

Method: Retrospective analysis of histopathological report included 117 patients underwent mastectomy and axillary lymph node clearance from January 2011 to July 2016 in professorial surgical unit teaching hospital Jaffna. The analysis assessed the adequacy of the axillary lymph node clearance considering the influence of tumor factor.

Results: Adequate axillary lymph node clearance was done in 89.7% (105). None of considered factors showed significance influence ($p < 0.05$) except tumor type.

Conclusion: Unit achieved desirable adequacy in axillary lymph node clearance, clearance adequacy is not associated with considered tumor factors except tumor type.

Keywords: Axillary lymphnode clearance, Adequacy, Breast cancer, nodal status

Introduction

Breast cancer is one of the commonest cancer in Sri Lankan female which may need mastectomy and axillary lymph node clearance(1, 2). Axillary lymph node clearance provides an important prognostic information that influences the management decisions(3,4,12,13). Lymph node stage is considered in Nottingham prognostic index and the decision of adjuvant chemotherapy. Spread to the node and number of node involved increase tendency of local recurrence and disease progression(4).

Our unit adopted a policy in the background of the studies (14-18) that Minimum of ten lymph nodes is required in the axillary clearance specimen to provide accurate information for staging. In this recommendation, it is determined that retrieval of ten axillary lymph nodes is the cut off value to consider a 90% certainty of a true negative axillary

status (10). Adequacy of lymph node retrieval may be influenced by the tumor factors (5-8). Even though our unit carries out axillary clearance, the current recommendation for axillary sampling - sentinel node biopsy (not available in our unit) is having less morbidity compare to axillary lymph node clearance.

Materials and Method

A retrospective cross sectional analytical study was designed to analyze data of 117 patients underwent mastectomy and axillary clearance between January 2011 and July 2016, in professorial surgical unit of Teaching hospital Jaffna.

The histopathology reports of those patients were assessed. The number of axillary lymph node harvested and tumor size, site, grade, type, lymphovascular state and receptor state were extracted.

The number of the axillary lymph node cleared was compared with recommended numbers in term of adequacy, considering association of tumor factor (tumor site, tumor size, tumor grade, tumor histology, lymphovascular invasion, hormonal receptor status and HER2 neu receptor status).

Data were entered and analyzed using the statistical package for social science (SPSS) computer software program. Results were expressed as percentage. Kolmogorov-Smirnov test indicates that Tumor factors and lymph node clearance adequacy do not follow a normal distribution. Because of that rank statistics (Non parametric) was used to analysis the data. P value <0.05 was considered as significant. Ethical Review Committee, Faculty of Medicine, University of Jaffna approved this study.

Results

More than 10 lymph nodes were harvested in 105 patients; therefore 89.7% of the patients had an adequate axillary node clearance according to the recommended standards. Moreover, 63 patients achieved more than 15 axillary lymph node clearances. This accounts for 53.8% among the nodal clearance. Out of 117 patients 36% had negative nodal state.

Among the 117 patients 52.1% of tumors were in the upper outer quadrant of breast. Upper outer quadrant had highest percentage of >10 axillary lymph node clearances while central achieved the lowest. However, the association between the tumor location and adequacy of axillary lymph node clearance is not significant ($p>0.05$).

Considering the tumor size 35% of tumors were T1 and 52.9% of tumors were T2. By percentage adequacy of axillary clearance was higher in T1 size tumors when compare to T2 and T3. The friedman test didn't signify this association ($DF=1$, $p >0.05$) & Spearman's test revealed no significant correlation between tumour size and adequacy of axillary lymph node clearance ($r=-0.102$).

Majority of the patients (83.7%) had ductal carcinoma. Among the tumor types, ductal carcinoma achieved the highest percentage (93.9%) of adequate axillary lymph node clearance. Sarcoma had the lowest percentage (50%) of adequate axillary lymph node clearance. This showed a significant association ($p<0.05$).

Based on tumor grade, 44.4% of tumors were grade i and 39.3% of tumors were grade ii. Highest number (93.5%) of adequate clearance achieved in grade ii tumors. It also showed a tendency of decreasing adequacy of lymph node clearance with increasing tumor grade, but that is not significant ($p>0.05$).

Lymphovascular invasion was positive in 48(41.02%) out of total 117 patients. Among those patients adequate LN clearance was achieved in 42(87.5%) patients. Among the remaining 69 patients without lymphovascular invasion 63(53.84%) had adequate LN clearance, but that is not significant ($p>0.05$). ER positive was 66.6%, PR positive and HER2 positive were 65% and 60.7% respectively. ER negative and PR negative patient had a higher rate of adequate axillary lymph node clearance than their positive counterparts. HER2 positive patients showed higher rate of adequacy than the HER2 negative patients. But these associations are statistically not proven. The following Table 1&2 summarizes the above results.

Table 1: Adequacy of axillary lymph node clearance with nodal status.

	Negative nodal state	Positive nodal state
lymph node clearance adequacy		
Less than 10 lymph nodes	06 (50%)	06 (50%)
More than 10 lymph nodes	41 (39.04%)	64 (60.96%)
Friedman test($DF = 1$, p value >0.05)		

Table 2: Tumor factors association with adequacy of the axillary lymph node clearance.

Tumor factor	<10 LN Clearance	>10 LN Clearance
Tumor site		
Upper outer quadrant	05(8.1%)	56(91.9%)
Upper medial quadrant	03(11.5%)	23(88.5%)
Lower outer quadrant	02(9.5%)	19(90.5%)
Lower medial quadrant	01(16.6%)	05(83.4%)
Central	01(33.3%)	02(67.7%)
Friedman test p value >0.05		
Tumor size		
T1	01(2.4%)	40(97.6%)
T2	05(8.1%)	57(91.9%)
T3	06(42.9%)	08(57.1%)

Friedman test p value >0.05		
Tumor type		
Ductal carcinoma	06(6.1%)	92(93.9%)
Lobular carcinoma	04(28.6%)	10(71.4%)
Sarcoma	01(50%)	01(50%)
Metaplastic carcinoma	01(33.3%)	02(66.7%)
Friedman test p value <0.05		
Tumor grade		
Grade i	05(9.6%)	47(90.4%)
Grade ii	03(6.5%)	43(93.5%)
Grade iii	04(21.1%)	15(78.9%)
Friedman test p value >0.05		
Lymphovascular invasion		
Positive	06(12.5%)	42(87.5%)
Negative	06(8.7%)	63(91.3%)
Friedman test p value >0.05		
Receptor status		
ER positive	10(12.8%)	68(87.2%)
ER negative	02(5.1%)	37(94.9%)
PR positive	08(10.5%)	68(89.5%)
PR negative	04(9.8%)	37(90.2%)
HER2 neu positive	06(8.5%)	65(91.5%)
HER2 neu negative	06(13.0%)	40(87.0%)
Friedman test p value >0.05		

Discussion

This study revealed that 89.7% of the patients had equal or more than ten lymph nodes retrieval during the axillary dissection. That indicates adequate axillary lymph node dissection rates of 89.7% which is compatible with study of Louisville(5). The adequacy of axillary lymph node dissection reported from other studies ranges from 49%(11) to 93%(8).

Tumour size, tumor grade, lymphovascular invasion, histological type and hormonal receptor status have been identified to correlate with nodal retrieval rates (5, 6, 8). However, two studies had found that there was no correlation between tumor factor and nodal retrieval rates (7, 11). Our study has also found that there is no significant association between tumor factors and adequacy of axillary lymph node clearance except tumor type according to the p values. It was found that surgeon academic experience is associated with high nodal retrieval rates (11). In our study, all the axillary nodal

harvesting was carried out by an experienced surgeon.

When considering the table 1, Identifying the positive nodal state is increased when retrieving more than 10 LNs when compare to retrieving less than 10 LNs. In table 2, Number of patients who had less than adequate clearance is same in positive and negative lymphovascular invasion. (Statistically not significant).

Out of 117 axillary clearance 47 (36%) became as nodal negative state. This finding suggests adopting the sentinel node biopsy and then axillary clearance rather than straight away doing the axillary clearance. Because, axillary clearance is associated with several morbidities. Those are, lymph oedema of upper limb, accidental damage to long thoracic and thoracodorsal nerves and axillary vein and thoracodorsal vessels.

Conclusion

This study has adequacy of 89.7% which is desirable and compares favorably with other studies. None of tumor factor influences adequacy of axillary nodal clearance except tumor type. Whenever possible, sentinel node biopsy should be adapted in all breast care units to avoid unnecessary axillary dissection which leads to complication.

References

1. Programme Ncc. Cancer incidence data. 2007. http://www.nccp.health.gov.lk/images/PDF_PUBLICATIONS/CancerRegistry2007.pdf
2. Stewart BW, Wild C, International Agency for Research on Cancer, World Health Organization. World cancer report 2014. Lyon, France Geneva, Switzerland: International Agency for Research on Cancer WHO Press; 2014. xiv, 630 pages p. <http://apps.who.int/bookorders/anglais/detart1.jsp?codlan=1&codcol=80&codcch=275>
3. Indranee Amarasinghe NP, Carmini Amerasinghe, Deepika Gunawardene Guidelines on management of breast lump College of surgeon sri lanka; 2007. <http://www.slco.lk/img/guidelines/Other%20national%20Gidelines/Surgeons/Book%204/Management%20of%20Breast%20Lump.pdf>
4. WHO. Guidelines for management of breast cancer: EMRO Technical Publications Series 2006. <http://applications.emro.who.int/dsaf/dsa697.pdf>
5. Chagpar AB, Scoggins CR, Martin RC, 2nd, Sahoo S, Carlson DJ, Laidley AL, et al. Factors determining adequacy of axillary node dissection

- in breast cancer patients. The breast journal. 2007;13(3):233-7. <http://onlinelibrary.wiley.com/doi/10.1111/j.1524-4741.2007.00415.x/abstract>
6. Kuru B, Bozgul M. The impact of axillary lymph nodes removed in staging of node-positive breast carcinoma. International journal of radiation oncology, biology, physics. 2006;66(5): 1328-34. <http://dx.doi.org/10.1016/j.ijrobp.2006.07.015>
7. Nderitu GR. Adequacy of axillary lymph node dissection in the management of breast cancer at kenyatta national hospital Nairobi: University of Nairobi;2014.<http://surgery.uonbi.ac.ke/sites/default/files/chs/medschool/surgery/Dr%20Gic here's%20dissertation%202014.pdf>
8. Straver ME, Rutgers EJ, Oldenburg HS, Wesseling J, Linn SC, Russell NS, et al. Accurate axillary lymph node dissection is feasible after neoadjuvant chemotherapy. American journal of surgery. 2009;198(1):46-50.<http://dx.doi.org/10.1016/j.amjsurg.2008.05.006>
9. Chetty U, Jack W, Prescott RJ, Tyler C, Rodger A. Management of the axilla in operable breast cancer treated by breast conservation: a randomized clinical trial. Edinburgh Breast Unit. The British journal of surgery. 2000;87(2):163-9. <http://dx.doi.org/10.1046/j.1365-2168.2000.01345.x>
10. Kiricuta CI, Tausch J. A mathematical model of axillary lymph node involvement based on 1446 complete axillary dissections in patients with breast carcinoma. Cancer. 1992;69(10):2496-501. [http://onlinelibrary.wiley.com/doi/10.1002/1097-0142\(19920515\)69:10%3C2496::AID-CNCR2820691018%3E3.0.CO;2-T/abstract](http://onlinelibrary.wiley.com/doi/10.1002/1097-0142(19920515)69:10%3C2496::AID-CNCR2820691018%3E3.0.CO;2-T/abstract)
11. Petrik DW, McCready DR, Sawka CA, Goel V. Association between extent of axillary lymph node dissection and patient, tumor, surgeon, and hospital factors in patients with early breast cancer. Journal of surgical oncology. 2003; 82(2): 84-90. <http://onlinelibrary.wiley.com/doi/10.1002/jso.10198/abstract>
12. Adwani A, Ebbs SR, Burton S, et al: Sentinel node biopsy should be supplemented by axillary sampling in patients with small breast cancers. Int Semin Surg Oncol 2:27, 2005. (<https://dx.doi.org/10.1186%2F1477-7800-2-27>)
13. Weir L, Speers C, D'yachkova Y, et al: Prognostic significance of the number of axillary lymph nodes reviewed in patients with nodenegative breast cancer. J Clin Oncol 20:1793- 1799, 2002. (<http://dx.doi.org/10.1200/JCO.2002.07.112>)
14. Carter CL, Allen C, Henson DE. Relation of tumour size, lymph node status, and survival in 24,740 breast cancer cases.Cancer 1989;63: 1817. (<https://www.ncbi.nlm.nih.gov/pubmed/2910416>)
15. Fitzgibbons PL, Page DL, Weaver D, et al. Prognostic factors in breast cancer, College of American Pathologists consensus statement 1999. Arch Pathol Lab Med 2000;124:966–78. (<https://www.ncbi.nlm.nih.gov/pubmed/10888772>)
16. Mathiesen O, Carl J, Bonderup O, et al. Axillary sampling and the risk of erroneous staging of breast cancer. An analysis of 960 consecutive patients. Acta Oncol. 1990; 29: 721-725. (<https://www.ncbi.nlm.nih.gov/pubmed/2223142?dopt=Abstract>)
17. Axelsson CK, Mouridsen HT, Zedeler K. Axillary dissection of level I and II lymph nodes is important in breast cancer classification. The Danish Breast Cancer Cooperative Group (DBCG). Eur J Cancer. 1992; 28A: 1415-1418. (<https://www.ncbi.nlm.nih.gov/pubmed/1515262>)
18. Recht A, Houlihan MJ. Axillary lymph nodes and breast cancer: a review. Cancer. 1995; 76: 1491-1512. (<https://www.ncbi.nlm.nih.gov/pubmed/8635050>)