

Role of Axillary Radiotherapy in Patients of Locally Advanced Carcinoma Breast with Inadequate or unknown Lymph Node Dissection Status - An Institutional Audit

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ABSTRACT

Introduction: Loco-regional radiotherapy to supraclavicular and Axillary region has been the standard of care for treatment of locally advanced carcinoma breast without or doubtful axillary clearance. We did a clinical audit of the patient care provided and the outcome of the same relating to loco-regional radiotherapy for such patients at a district medical college in India.

Material and methods: All patients with locally advanced carcinoma breast between 2007 and 2013 who had treatment in the Department of Radiotherapy were audited. The patients were stratified as per surgery they had and pathological information that was available in their post op HPE report along with type of radiotherapy they received. The analysis was done with IBM SPSS V23.

Results: over the period of 6 years there were 874 patients of carcinoma breast registered in the Department. Out of them 246 were metastatic. 12 were early breast carcinomas, rest 616 were LABC who had indications of Supraclavicular and Axillary RT due to any reason. Out of these 616 patients the indication in 592 patients was lack of pathological information in terms of number of nodes dissected being lesser than 10. 138 of them were referred from other centers where Radiotherapy was not available and therefore they followed up at other centers. 77 patients never completed their treatment (radiotherapy or chemotherapy). Additionally 42 patients never came for any follow up after their treatment completion. A total of 359 analyzable patient records were found who had at least one follow up.

Conclusion: In our audit due to limited resources nearly 63% of the patients received RT only chest wall and supraclavicular region RT. However it did not change the loco-regional failure rate at 5.3 years. A longer follow up data of 10 years is necessary to see whether this trend is continued to OS. However the present retrospective data provides a starting point for prospective clinical trials to look if certain group of patients may benefit from omitting Axillary Radiotherapy even when the dissection had yielded lesser than 10 nodes.

Keywords: Locally Advanced Carcinoma Breast, Axillary Lymph Node Dissection, Radiotherapy.

without or doubtful axillary clearance.

However, in a resource scare country, where the primary demand is to deliver the whole treatment including radiotherapy as near to the patient as possible, it becomes challenging to deliver everything every time. Most of our patients come with limited pathological information regarding the disease. Surgical clearance of Axilla has been objectively defined as more than 10 nodes detected in the surgical specimen. However despite an attempted surgical clearance there may be multiple reasons for not getting enough numbers of axillary nodes in the specimen. This include incomplete surgical clearance due to any cause, less number of axillary nodes in the axilla as a normal anatomical variant, incomplete grossing. It is difficult to pinpoint the actual cause of not meeting the objective number of nodes in a specific patient and say who had actually undergone a complete axillary clearance and who has not. Thus there remains practical grey area in which patients we can avoid axillary radiation even when axillary clearance has not met the desired number of nodes.^{1,2}

We did a clinical audit of the patient care provided and the outcome of the same relating to loco-regional radiotherapy for such patients at a district medical college in India in order to get directions if there are the criteria of 10 axillary lymph nodes are absolute in such scenario.

MATERIAL AND METHODS

Charts of all locally advanced carcinoma breast patients who were treated in our department from 2007 to 2013 were included in the audit. Patients who had incomplete treatment were excluded from the study. We also excluded those patients who did not come to our institute for follow up.

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How to cite this article: Suman Ghorai, Ujjal Kumar Mandal, Jaybrata Biswas, Suparna Kanti Pal. Role of axillary radiotherapy in patients of locally advanced carcinoma breast with inadequate or unknown lymph node dissection status - an institutional audit. International Journal of Contemporary Medical Research 2019;6(6):F1-F3.

DOI: <http://dx.doi.org/10.21276/ijcmr.2019.6.6.27>

INTRODUCTION

Carcinoma Breast is one of the leading causes of cancer deaths in India and is increasing in frequency esp in urban areas. Most of these patients present in locally advanced or metastatic stage. Loco-regional radiotherapy to supraclavicular and Axillary region has been the standard of care for treatment of locally advanced carcinoma breast

Outpatient file with unique Radiotherapy Unit Registration ID and year of registration was used as source document. A descriptive approach was taken for the presentation of data. Our primary aim of the audit was to determine if there is any statistical difference in loco-regional failure between groups who received and who did not receive posterior axillary boost. The incidence was obtained and Fischer's exact T test was used to determine the significance (p Value). This test was used since the numbers of events were small in some of the categories. The analysis was done with IBM SPSS V23 and med calc.

RESULTS

Between 2007 and 2013, i.e.; over the period of 6 years there were 874 patients of carcinoma breast registered in the Department. Out of them 246 were metastatic. 12 were early breast carcinomas, rest 616 were LABC who had indications of Supraclavicular and Axillary RT due to any reason. Out of these 616 patients the indication in 592 patients was lack of pathological information in terms of number of nodes dissected being lesser than 10. 138 of them were referred from other centers where Radiotherapy was not available and therefore they followed up at other centers. 77 patients never completed their treatment (radiotherapy or chemotherapy). Additionally 42 patients never came for any follow up after their treatment completion. A total of 359 analyzable patient records were found who had at least one follow up.

Surgical intervention - All patients included in our audit underwent radical mastectomy including axillary clearance as per their post operative discharge note. However we included those patients in our audit whose number of detected lymph node on post operative histopathology sample was lesser than 10.

Out of these 359 patients, 198 patients received PMRT but no Axillary radiotherapy in form of posterior axillary boost (Arm A) while the rest (137) received axillary RT in addition to chest wall and Supraclavicular RT (arm B). Out of the 359 patients 176 patients (108 and 68 in each group respectively) were recorded to have pretreatment palpable nodes.

Most of these patients, 190 in the A arm and 118 in the arm B had received Neoadjuvant chemotherapy for 4 to 6 cycles. All of them were anthracycline based chemotherapy except seven in the Arm B who had Taxane based chemotherapy due to coexisting cardiac morbidities.

The median follow up period was 5.3 yrs. The number of axillary failures were 11 (5.5%), and 6 (4.3%) ($p=0.80$).

The number of supraclavicular failures were 5(2.5%), and 2(1.5%) ($p=0.71$). Chest wall failure rates were 7 (3.6%), and 4(2.9%) ($P=1.0$). None of them were statistically significant.

DISCUSSION

Axillary Radiotherapy has been used as part of treatment of Breast carcinoma for a long time along with chest wall and Supraclavicular radiotherapy. Chest wall radiotherapy is delivered generally by tangential beams which also irradiates a part of axillary lymph nodes. Extended supraclavicular fields provides some but sub-therapeutic doses of Radiation

to the axilla. This is because supraclavicular radiotherapy is prescribed by direct anterior fields at a depth of 3 cm while the axillary separation is likely to be more than that. In our institute Axillary radiation is delivered by extended supraclavicular field with addition of post axillary boost. Anterior axillary boost technique, AP-PA, and IMRT for axillary boost has been tried by various authors. Hernandez et al¹ showed that anterior axillary boost and AP-PA techniques are dosimetrically inferior in western population. Wang et al² in their study showed dosimetric superiority of IMRT over both anterior axillary boost and posterior axillary boost technique. Though there are no consensus, Post axillary boost remains the most common method for conventionally delivering radiation boost to axilla.

The UK NICE guidelines recommends to offer axillary Radiotherapy to patients who have histologically node positive and who had not undergone axillary clearance.³ Axillary clearance most often defined as complete dissection of Level I and II axillary nodes. Since the completion status is per-operative, it was felt necessary to determine an objective value of complete axillary dissection. Multiple studies in later half of the last century came to a conclusion that ten lymph nodes were required for completion of axillary dissection.⁴⁻⁶ For prognostic purpose a similar model was proposed by collage of American Pathologists in 2000.⁷ The UICC TNM staging of 2002, taking into account the widespread use of neo-adjuvant chemotherapy had proposed at least six lymph nodes in axilla to be documented for proper pathological staging of the axilla.⁸ Somner et al in their studies had concluded that at least 16 lymph nodes were required to be dissected for complete clearance.⁹ However ten nodes continued to remain the most preferred definition. In 2010, Boughey et al¹⁰ published their study showing that Neo-adjuvant chemotherapy does not interfere with identification of Lymph nodes on axillary dissection. Rather they showed that training of the surgeons and institute at which it is performed are the main factors for the difference in yield. The 2018 AJCC TNM¹¹ did away with the minimum Lymph node criteria for staging as more and more patients underwent Sentinel LN biopsy compared to axillary clearance in western world.

Thus the objective indication of axillary radiotherapy remained debatable. In our study, most of our patients received neo-adjuvant chemotherapy. About half of them were clinically node positive. Even though they underwent axillary clearance as per surgical records, there were not enough nodes identified in the Histopathological sample.

A meta-analysis of studies conducted between 1964 and 1986, showed that addition of radiotherapy in form of chest wall RT and supraclavicular and/axillary radiotherapy improved loco-regional control and overall recurrence rate.¹² In the MA20 study Whelan showed that node positive breast cancer with primary tumours <5 cm, the addition of nodal irradiation reduced recurrence rate but not overall survival.¹³ The present area of interest in developed countries has shifted to conservative surgeries and therefore Axillary sampling has become popular. Newer trials have mostly focussed

on comparisons of axillary clearance vis a vis axillary radiotherapy. The AMROS trial¹⁴, the NSABP-04 trial¹⁵ and the French trial¹⁶ all concurred that axillary dissection and Radiotherapy provides non inferior results. All these trials defined axillary nodal dissection as level I and II dissection with at least 10 lymph nodes in the sample.

Thus our patients did not fall in the criteria of ALND as defined in these large western clinical trials. Similarly most of our patients were non bulky. We used posterior axillary boost technique to irradiate the axilla. There are no records of axillary separation (anterior-posterior skin to skin distance between the axillary folds in our patients who did not receive axillary radiotherapy. However for those who did the mean axillary separation was 7.6 cm with range of 5.7 cm to 11.8 cm. The calculated posterior axillary boost dose ranged from 550 cGy to 1365 cGy with a mean of 786 cGy. Thus in our cohort the axilla had actually received a EQD2 of a minimum of 3635 cGy even upto 4450 cGy, which happens to be 73% to 89% of the generally prescribed doses. This may have been a reason for equitable results in both the arms. The case might have been different in patients with higher axillary separation.

The incidence of arm oedema was more in the axillary radiotherapy arm with nearly 25% (34 in number) developed arm oedema while in the other arm the incidence was 20% (41 patients). Arm oedema is a significant known factor in detriating QOL in breast cancer patients.

CONCLUSION

This audit shed light on the issue of inadequate availability of information for informed decision making for offering axillary radiotherapy in our institute. In our audit due to limited resources nearly 63% of the patients received RT only chest wall and supraclavicular region RT. However it did not change the loco-regional failure rate at 5.3 years. A longer follow up data of 10 years is necessary to see whether this trend is continued to Overall survival. A prospective clinical trial is being designed to look for subsets of patients with less than 10 nodes in post-operative histopathology in whom radiotherapy can be safely omitted.

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Source of Support: Nil; **Conflict of Interest:** None

Submitted: 07-06-2019; **Accepted:** 13-06-2019; **Published:** 23-06-2019