



LEVEL III AXILLARY LYMPH NODE DISSECTION IN OPERABLE CASES OF BREAST CANCER IN INDIA

General Surgery

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ABSTRACT

Background- When radical mastectomy with en bloc resection of the axillary contents was the primary treatment for Breast Cancer(BC), the existence of discontinuous metastases or the exact knowledge of patterns of spread of axillary lymph node(ALN) metastases was not a major concern. In the current era where surgical options for BC include incomplete axillary dissections or ALN sampling, this knowledge of lymph node spread is essential for making appropriate therapeutic decisions. Axillary dissection is an essential component of breast cancer surgery, intending to control local recurrence and classify the tumor (pN) stage. Hence the present study is undertaken to study level III ALN dissection in operable cases of breast cancer.

Method- A total of 55 patients underwent Modified Radical Mastectomy (MRM) with complete axillary clearance. Demographic data and perioperative details, axillary clearance, histopathological evaluation, surgical outcome and complications were noted.

Result- The majority of studies, age group was from 41-50 years (45.45%). Commonest tumor size was 2-5cm (70.91%). The most common stage was III-A(43.64%). Commonest quadrant was the upper outer (30.91%). Commonest histological type was ductal (94.55%) and grade was grade II(61.82%). Average lymph node dissected per case was 14.3. Percentage of patients with level III lymph node involvement is 50.91% and among them, most common stage –III-A (53.57%), grade- grade II(67.86%), type- ductal (96.43%), quadrant- upper outer (39.29%), tumour size- 2-5cm (64.29%). Level III “skip metastasis” was found in 1 patient (1.8%). 34.5% patients had postoperative pain.

Conclusion- In a low-middle-income country like India, we advocate axillary clearance up to level III in all operable cases of breast cancer with minimal or no morbidity. However, Randomised Controlled Trials or Meta-analysis should be done for further clearance.

KEYWORDS

breast cancer, axillary dissection, Level III axillary dissection, level III “skip metastasis”

INTRODUCTION –

Breast cancer (BC) is one of the leading cause of cancer-related death among women. Late-stage diagnosis of BC is associated with a poor prognosis. BC is the most common non-skin malignancy in females with incidence of 25.8/ 100000 women in India and 43.1/100000 worldwide in 2012. The primary treatment of BC depends essentially on surgery, with survival of 100% in patients with early-stage disease(Sathwara et al., 2017; Selvi, n.d.) When radical mastectomy with en bloc resection of the axillary contents was the primary treatment for BC, the existence of discontinuous metastases or the exact knowledge of patterns of spread of axillary lymph node (ALN) metastases was not a major concern. However the surgical technique dates back to the 1st century. Over the years various refinements and modifications led to MRM and recently Breast Conservation Surgery(BCS). Increasing incidence of BC in India is a major cause of concern and calls for identifying appropriate surgical techniques for complete disease clearance. Presently a standard MRM includes removal of level I and II ALN.(Fischer et al., 2012).

In current era where surgical options for BC include incomplete axillary dissections or ALN sampling, this knowledge of lymph node spread is essential for making appropriate therapeutic decisions.(Selvi, n.d.) The histological status of the ALN impact the behavior of disease progression.(Sacks et al., 1992). Axillary dissection is essential component of breast cancer surgery, to control local recurrence and classify the tumour (pN).

In India, usually patients present at higher stage and with an increased incidence of ALN involvement(Joshi et al., 2019) this also carries a risk of level III axillary “skip” metastasis. (Rosen et al., 1983). Hence the present study is undertaken to study level III ALN dissection in all operable breast cancer and note the outcomes.

METHODS-

This prospective observational study was conducted in 55 patients meeting the inclusion criteria - Patients with primary BC of Stage I, IIA, IIB, IIIA (as per NCCN guidelines)

EXCLUSION CRITERIA-

Stage IV, Recurrent Carcinoma Breast, Unfit for surgery, patients undergoing BCS

Detailed history, socioeconomic status (by Modified Kuppuswamy Socioeconomic Scale)was taken and clinical examination was done.

Detailed investigations and metastatic workup were done. Preoperative clinical and histopathological (HP)(FNAC and/or trucut biopsy) investigation findings were noted. Patients were evaluated for performance status by ECOG (Eastern Cooperative Oncology Group) performance Status scale.(*ECOG Performance Status*, n.d.). Pre-anesthetic checkup and fitness for surgery was done. Written informed consent of all the patients & relatives was obtained. All patients underwent MRM with level III ALN clearance upto the costoclavicular ligament of Halstead. Level III lymph nodes were approached via interpectoral approach i.e retracting the Pectoralis minor muscle laterally and identifying the space between Pectoralis major and minor muscles or by subpectoral approach. Level III ALN were analyzed histopathologically.

Perioperative details were noted and routine postoperative care was adopted. All patients had an uneventful hospital stay. The follow-up period ranged between 6-18 months with special attention to lymphedema, restricted shoulder movements, pain.

STATISTICAL ANALYSIS-

No statistical methods were used as this was a prospective observational study. All data is presented in tabular forms in numbers and percentages.

RESULTS –

Patients' age ranged between 31 and 79 years. The most common age group was 41-50 years(45.45%) and stage of the presentation was IIIA(43.64%). 39 patients had tumour size within 2-5cm(70.91%) and 30.91% had tumour in Upper Outer quadrant. On HP examination, 52 patients had Ductal Carcinoma type(94.55%) and 34 patients (61.82%) had grade II histological malignancy. 62% patients had ECOG performance score of 0 followed by 38% with a score of 1. 44% patients belonged to upper lower socioeconomic class followed by 22% in lower socioeconomic class.

An average of 14.3 lymph nodes per patient were dissected. On HP analysis, level III ALN were identified in 50 patients (90.91%). Out of which 56% patients (50.91% of total patients) have positive level III ALN.(53.57%) of patients with positive level III ALN are of stage III-A, 32% was II-B and 14.3% was level II-A. 68% of patients had histological grade II followed by grade III (21%) and grade I (11%). 97% patients with positive level III ALN had ductal carcinoma and 39% patients had upper outer quadrant tumour. About 64% patients with positive level III ALN have tumour size of 2-5cm. Level III ALN

"skip metastasis" was found in 1 patient (1.82%). 34.5% patients had pain as a complication. we didn't encounter any shoulder movement restriction or lymphedema.

Table 1- Correlation between Socioeconomic status & stage of presentation

SOCIOECONOMIC CLASS	STAGE				TOTAL
	I	II-A	II-B	III-A	
UPPER	0	0	0	0	0
UPPER MIDDLE	0	1	0	1	2
LOWER MIDDLE	0	3	10	4	17
UPPER LOWER	0	3	9	11	23
LOWER	0	2	3	8	13
					55

Table 2- Correlation between Socioeconomic Status & tumour size at presentation

SOCIOECONOMIC CLASS	TUMOUR SIZE			TOTAL
	<2CM	2-5CM	>5CM	
UPPER	0	0	0	0
UPPER MIDDLE	0	1	1	2
LOWER MIDDLE	0	12	5	17
UPPER LOWER	0	17	7	24
LOWER	0	9	3	12
				55

In our study, most common socioeconomic class was upper lower in which most common stage was III-A (11/23=47.83%) & most common size at presentation was 2-5cm (17/24=70.83%) suggestive of late presentation in our patients. (Table 1 and 2).

DISCUSSION-

Surgical therapy still plays a vital role to cure in BC and ALN dissection offers the most efficient local control. ALN involvement has been accepted as a prognostic factor as per revised 6th edition of the AJCC staging manual.(Khafagy et al., 2011) .A collaborative group study by The Early Breast Cancer Trialists reported 1 life saved for 4 local recurrences avoided. A recent Cochrane review too states that less axillary surgery was associated with a reduced overall survival as compared with complete ALN dissection.(Joshi et al., 2019)

In our analysis, we found 28 out of 55 patients (50.91%) had level III axillary metastatic deposits which goes with the study reported by Khafagy et al (52.5%)(Khafagy et al., 2011)(Table-3)

Graverson and his colleagues stated an inverse relation between ALN clearance and the risk of axillary failure(Khafagy et al., 2011) which was also evident in our study. As 50.91% patients had level III ALN involvement. A standard MRM with only level I and II clearance could have left a residual disease in 50.91% patients.

We encountered level III skip metastases in 1 patient (1.87%). In another study Khafagy et al. and Rosen et al reported 1.7% and 0.4% skip metastases respectively. Where 10% was reported by Smith et al.(Smith III et al., 1977). This discrepancy between various studies could be due to varied time of presentation and clinical stage of the BC due to locoregional, socioeconomic factors and available therapeutic facilities.(Khafagy et al., 2011)(Table-4)

According to Rosen, it's likely that intervening apparently negative ALN harbor micrometastases, that could be found by serial sectioning. Although ALN can be identified from anatomic landmarks in some radical mastectomy specimens but landmarks can be altered. In most MRMs, it is difficult to locate the levels on gross inspection only. In patients with incomplete axillary dissections, the "skip" metastases may contribute to the risk of axillary recurrence in those thought to be free of axillary metastases.(Rosen et al., 1983)

In our study average number of lymph nodes dissected per patient was found to be 14.3 lymph nodes per patient. Selvi et al 2019 (Selvi, n.d.) reported 13 lymph nodes per patient. Fan et al(Fan et al., 2013), S.Joshi et al(Joshi et al., 2019) reported 19 lymph nodes per patient each. Since ours is a teaching institute, learning pathologists may fail to report or identify LN leading to lower counts of identified LN per patient as compared to others.

Table 3- Percentage of patients with level III nodes involvement.

STUDY	PERCENTAGE OF PATIENTS WITH LEVEL III INVOLVEMENT
OUR STUDY	50.91%
DANFORTH ET AL 1985 (Danforth et al., 1986)	25.35%
KODAMA ET AL 2006(Kodama et al., 2006)	7.4%
ASLAN ET AL 2009(Aslan et al., n.d.)	31%
KHAFAGY ET AL 2011(Khafagy et al., 2011)	52.5%
FAN ET AL 2013(Fan et al., 2013)	9%
S.JOSHI ET AL 2019(Joshi et al., 2019)	27.3%

Table 4- Percentage of incidence of level III axillary "skip" metastases.

STUDY	INCIDENCE OF LEVEL III "SKIP" METASTASIS
OUR STUDY	1.8%
SMITH ET AL 1977(Smith III et al., 1977)	10%
BOOVA ET AL 1982(Boova et al., 1982)	0.5%
ROSEN ET AL 1983 (Danforth et al., 1986; Rosen et al., 1983)	0%
DANFORTH ET AL 1985(Danforth et al., 1986)	3.1%
VERONESI ET AL 1987(Veronesi et al., 1987)	0.4%
KODAMA ET AL 2006(Kodama et al., 2006)	0.4%
ASLAN ET AL 2009(Aslan et al., n.d.)	1.1%
KHAFAGY ET AL 2011(Khafagy et al., 2011)	1.7%
SELVI ET AL 2019(Selvi, n.d.)	0%
S.JOSHI ET AL 2019(Joshi et al., 2019)	0.7%

In our study, cases were operated by experienced surgeons and axillary dissection didn't go beyond axillary vein. All neuro vasculature was conserved.

Post-op shoulder movement restriction wasn't encountered as compared to Kodama (8.6%), Devoogdt (28%), Brar (22%) (Brar et al., 2011; Devoogdt et al., 2011; Kodama et al., 2006).

Lymphedema too wasn't encountered as compared to Khafagy et al (Khafagy et al., 2011) (10.1%), Kodama et al(Kodama et al., 2006) (5.8%) as axillary compression with crepe bandage application immediately in post-op period and continued physiotherapy was given. Postoperative pain was encountered in 34.5% patients as comparable to Devoogdt(40%) , Brar(39%)(Brar et al., 2011; Devoogdt et al., 2011)

CONCLUSION

An R0 surgical resection is the standard method of achieving optimal local clearance of disease in breast cancer patients.

Our experience suggests that most cases were presented and diagnosed in advanced stage.(II and more).(Khokhar, 2012). With level III ALN involvement, an incomplete/ partial axillary clearance will leave behind a residual disease and thereby recurrence, morbidity and mortality.(Krishna Boralkar et al., 2021)(Rosen et al., 1983)

With previous studies (Joshi et al., 2019) and our experience, in a lower middle-income country like India, we advocate complete level III axillary clearance in operable breast cancer cases for complete disease clearance.

However, Randomised controlled trials and meta-analyses should be done for further clearance.

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