



THE ROLE OF INTRAOPERATIVE FROZEN SECTION DIAGNOSIS OF SENTINEL LYMPH NODE IN EARLY BREAST CANCER

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ABSTRACT

Background: Sentinel lymph node biopsy (SLNB) is now the standard of care for axillary staging in patients with clinical lymph node negative breast cancer. **Objective:** In this study our main goal is to evaluate the role of intraoperative frozen section diagnosis of sentinel lymph node in early breast cancer. **Method:** This cross-sectional study was performed at Tertiary medical college and hospital from 2019 to 2020 involving 50 cases of invasive ductal carcinoma (IDC), and 50 cases of invasive lobular carcinoma (ILC) who undergone intraoperative frozen section analysis and confirmatory permanent section analyses that was performed on at least one SLN during definitive breast cancer surgery were included as a sample population. **Results:** During the study most of the patients belong to 32-42 years age group, 62.5%. Mean age was 36±6.28 years. Besides that, 75% patients married in 13-17 years age and got 1st pregnant by 14-18 years old. 90% cases had estrogen receptor followed by 85% cases had Progesterone receptor, 40% had HER2 positive status. Mean tumor size 18.3mm. In invasive lobular carcinoma group, 30% and 40% positive cases were found in frozen section analysis and permanent of SLN whereas Invasive ductal carcinoma group it was 28% and 31%. In addition, during evaluation about finding of a positive sentinel lymph node, no statistically significant difference was noted in any of variables for ILC versus IDC patients. **Conclusion:** We can conclude that, frozen section analysis of all SLNs during breast cancer surgery in patients should continue to be the standard of care in order to reduce the risk of the need for a later, separate axillary lymph node dissection.

KEYWORDS: Breast cancer, Sentinel lymph node (SLN) biopsy, Invasive ductal carcinoma (IDC), Invasive lobular carcinoma (ILC).

INTRODUCTION

Sentinel lymph node (SLN) biopsy with intraoperative frozen section analysis has become the gold standard for axillary surgical staging during breast cancer surgery.^[1]

The sensitivity of intraoperative frozen section analysis for identifying nodal metastases within SLNs during breast cancer surgery has been reported to range widely from 44% to 95% with most series reporting sensitivity of frozen section analysis in the range of 60% to 75%.^[2]

SNL biopsy is now well established as the standard of care for patients with clinically node-negative invasive breast cancer, with comparable oncological outcomes and less morbidity compared to ALND.^[3-4]

In cases of histologically positive SLN biopsy, ALND completion is usually recommended. Intraoperative SLN assessment via frozen section could identify

approximately 60% of positive SLN, allowing for immediate ALND and avoiding reoperation.^[5]

However, only 20% of these frozen section procedures reveal metastases.⁶ Furthermore, frozen section positive patients who received immediate ALND were not consistently spared a reoperation because more than half required additional surgery for positive margins after breast-conserving surgery. Furthermore, it is well understood that lymph node metastasis is more likely to be missed during a frozen section than during a definitive section.^[7-8]

In this study our main goal is to evaluate the role of intraoperative frozen section diagnosis of sentinel lymph node in early breast cancer.

OBJECTIVE

To assess the role of intraoperative frozen section diagnosis of sentinel lymph node in early breast cancer.

METHODOLOGY

This cross-sectional study was performed at Tertiary medical college and hospital from 2019 to 2020 involving 100 patients with early breast cancer who underwent conservative surgery or total mastectomy with sentinel lymph node biopsy.

During the study 50 cases of ILC and 50 cases of IDC who undergone intraoperative frozen section analysis and confirmatory permanent section analyses that was performed on at least one SLN during definitive breast cancer surgery were included as a sample population.

Data entry, quality control and data cleaning had been done following standard method. All data forms and questionnaires had been checked for errors and necessary correction had been made before data entry. Data had been entered using data entry program with built in range

and consistency checks (SPSS). The prevalence rate had been determined by simple percentages.

RESULTS

In table-1 shows age distribution of the patients where most of the patients belong to 32-42 years age group, 62.5%. Mean age was 36 ± 6.28 years. The following table is given below in detail:

Table 1: Age distribution of the patients.

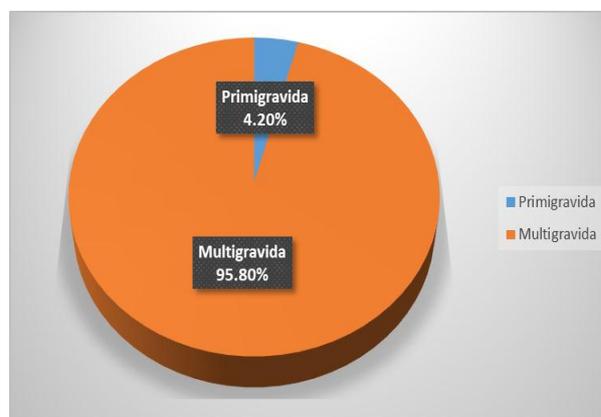
	Frequency	Valid Percent
21-31 years	5	20.8
32-42 years	15	62.5
>43 years	4	16.7
Total	24	100.0

In table-2 shows demographic status of the patients where 41.7% just completed their secondary level of education followed by 38.9% patients husband were farmer, 75% patients married in 13-17 years age and got 1st pregnant by 14-18 years old. The following table is given below in detail:

Table-2: Demographic status of the patients

Educational status	%
Illiterate	8.3%
Primary	12.5%
Secondary	41.7%
SSC	25%
HSC	12.5%
Husband occupation	
Businessman	38.9%
Farmer	38.9%
Rickshaw puller	16.7%
Track driver	5.6%
Income	
10000-15000tk monthly	54.2%
>150000 monthly	45.8%
Age of marriage	
13-17 years	75%
18-25 years	25%
1st pregnancy age after marriage	
14-18 years	75%
19-25 years	25%

In figure-1 shows parity distribution where primigravida were 4.2% and multigravida were 95.8% cases. The following figure is given below in detail:

**Figure 1: Parity distribution.**

In table-3 shows distribution of the patients according status of tumor where 90% cases had estrogen receptor followed by 85% cases had Progesterone receptor, 40% had HER2 positive status. Mean tumor size 18.3mm. The following table is given below in detail:

Table-3: Distribution of the patients according status of tumor

Pathological tumor size	Median diameter (mm 18.3)
Histologic type	%
Ductal infiltrating	90%
Lobular infiltrating	10%
Histologic grading	%
G1	20%
G2	65%
G3	15%
Estrogen receptors	%
Positive	90%
Negative	10%
Progesterone receptor	%
Positive	85%
Negative	15%
HER2 status	%
Positive	40%
Negative	65%
Mean Number of removed SLN	2.5

In table-4 shows sentinel lymph node demographics on the basis of cancer types where in invasive lobular carcinoma group, 30% and 40% positive cases were found in frozen section analysis and permanent of SLN where as Invasive ductal carcinoma group it was 28% and 31%. The following table is given below in detail:

Table 4: Sentinel lymph node demographics on the basis of cancer types

Frozen section analysis of SLN	ILC, %	IDC, %
Positive	30%	28%
Negative	70%	72%
Permanent section analysis of SLN	ILC,%	IDC,%
Positive	40%	31%
Negative	60%	69%
Classification of metastatic disease	ILC,%	IDC,%
Macrometastatic (>2.0 mm)	30%	20%
Micrometastatic (≤ 2.0 mm)	10%	11%
Unknown classification	2%	9%
No metastatic disease	57%	60%

In table-5 shows the sensitivity, specificity, accuracy, false negative rate, negative predictive value, and positive predictive value of frozen section analysis compared to permanent section analysis for the finding of a positive sentinel lymph node where no statistically significant difference was noted in any of these variables for ILC versus IDC patients. The following table is given below in detail:

Table-5: Sensitivity, specificity, accuracy, false negative rate, negative predictive value, and positive predictive value of frozen section analysis compared to permanent section analysis for the finding of a positive sentinel lymph node

	ILC, %	IDC, %	P value
Sensitivity	65%	78%	0.389
Specificity	100%	100%	-
Accuracy	83%	90%	0.170
False negative rate	35%	23%	0.325
Negative predictive value	80%	90%	0.157
Positive predictive value	100%	100%	-

DISCUSSION

In our study, the sensitivity of frozen section analysis (65% for ILC patients, 78% for IDC patients, was well within the range of sensitivity for frozen section analysis results in most previously reported series in the literature for SLN biopsy during breast cancer surgery.^[8-10]

Therefore, our frozen section analysis results, based on sensitivity, are highly consistent with the mainstream practice of intraoperative frozen section analysis for SLN biopsy during breast cancer surgery.

Likewise, in our study, we did not find a statistically significant difference in the false negative rate for frozen section analysis for SLN biopsy for ILC as compared to IDC.

Although this may initially seem surprising to some, the vast majority of the literature supports the routine use of intraoperative frozen section analysis for SLN biopsy during breast cancer surgery for ILC cases.

Never the-less, several authors have previously reported that false negative frozen section results are more likely in SLN biopsy for ILC as compared to for IDC.^[11-15]

Another study analyzed a total of 375 breast cancers and reported that the false-negative rate for frozen section analysis during SLN biopsy was more common for ILC than IDC (28% versus 8%, $P < 0.01$) in an overall analysis of 102 ILC versus 194 IDC.^[16]

Another study reported seeing 102 cases of ILC among a total of 375 total breast cancer cases during a 22 month time period. This signifies that ILC makes up an astonishing 27.2% of all the breast cancers seen in Helsinki, Finland. This is in stark contrast to the maximum of 10% to 15% of ILC cases that are generally seen among all presenting breast cancers within the United States.^[17]

In contrast, most series in the literature generally report a false negative rate of frozen section analysis for SLN biopsy for breast cancer cases is in the range of anywhere from 26% to 56%^[18], including our own current series in which the false negative rate of frozen

section analysis for SLN biopsy was 35% for ILC, 23% for IDC. This particular aspect of another study who reported series can not be easily explained in view of the rest of the reported literature and casts some doubt into their results and contention that false negative frozen section results are more likely in SLN biopsy for ILC as compared to for IDC.^[11]

CONCLUSION

We can conclude that, frozen section analysis of all SLNs during breast cancer surgery in patients should continue to be the standard of care in order to reduce the risk of the need for a later, separate axillary lymph node dissection.

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