Comparative Study between Imprint Cytology and Frozen Section Biopsy for Intraoperative Assessment of Sentinel Lymph Node in Breast Cancer

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Introduction

- Breast cancer is the most frequently diagnosed life-threatening cancer in women worldwide
- In 2020, over 680,000 women died from breast cancer globally
- **In less-developed countries, breast cancer is the leading cause of cancer death in women, while in developed countries, lung cancer has surpassed it**
- Early breast cancer is often asymptomatic and detected via mammograms before symptoms appear

Introduction(cont.....)

- **Treatment goals include controlling the disease, improving survival, reducing metastasis risk,** and restoring quality of life
- **Treatment modalities for breast cancer include surgery, radiotherapy, systemic therapy, and targeted treatments for HER2**
- Surgery remains crucial for **eradicating the primary tumor and achieving total disease control**

Introduction(cont.....)

- **SLNB is the gold standard for surgical staging of the axilla in breast cancer,** reducing the need for second surgeries and lowering morbidity and costs
- **Various cytological techniques, such as imprint cytology, offer rapid intraoperative evaluation** of tumors and surgical margins
- **Imprint cytology, first utilized in 1927, remains a reliable technique with a diagnostic accuracy of 98.1%** in detecting lesions

Introduction(cont.....)

- **Frozen section biopsy provides results within an hour,** allowing immediate feedback during surgeries and influencing surgical decisions
- **The study compared the sensitivity and specificity of imprint cytology and frozen section** on the same sentinel lymph nodes of breast cancer cases operated in Dhaka Medical College Hospital and two private centers in Dhaka

Rationale

- **In approximately 70% of early breast cancer cases, axillary lymph nodes are not involved**
- **Unnecessary axillary dissection can lead to complications** such as seroma formation, lymphedema, and frozen shoulder
- In Bangladesh, **intraoperative assessment of SLN is primarily done through frozen section biopsy,** which has high sensitivity and specificity

Rationale(cont.....)

- **While histopathology remains the gold standard for final diagnosis**, it may cause delays in treatment decisions
- **Frozen section biopsy is not widely available in all healthcare facilities in Bangladesh,** but **imprint cytology can be performed in any pathology lab**, requiring only basic logistics

Research Question

Is imprint cytology inferior to frozen section biopsy ?

Objectives

General Objective

- To compare between imprint cytology and frozen section biopsy for intraoperative assessment of sentinel lymph node in breast cancer

Objectives

Specific Objectives

- To see the imprint cytology of sentinel lymph nodes
- To see the frozen section biopsy of sentinel lymph nodes
- To assess the sensitivity and specificity of imprint cytology of sentinel lymph nodes
- To assess the sensitivity and specificity frozen section biopsy of sentinel lymph nodes

Material and Methods

Study Design : It was a prospective observational study

Place of Study : Department of Surgery, Dhaka Medical College Hospital (DMCH), and two different private medical centers in Dhaka.

Study Period : From January 2024 to December 2024

Sample Size : 95

Sampling Technique: Purposive sampling

Selection Criteria

Inclusion Criteria

- Breast cancer with negative lymph node in preoperative assessment

Exclusion criteria:

- Breast cancer with histologically positive axillary lymph node
- Recurrent breast cancer

Variables

1. TNM staging
2. Histopathology
3. Receptor status
4. Type of surgery
5. Imprint cytology of Lymph nodes
6. Frozen section of lymph nodes

Results

Table 3.1 TNM staging of the study population (N=95)

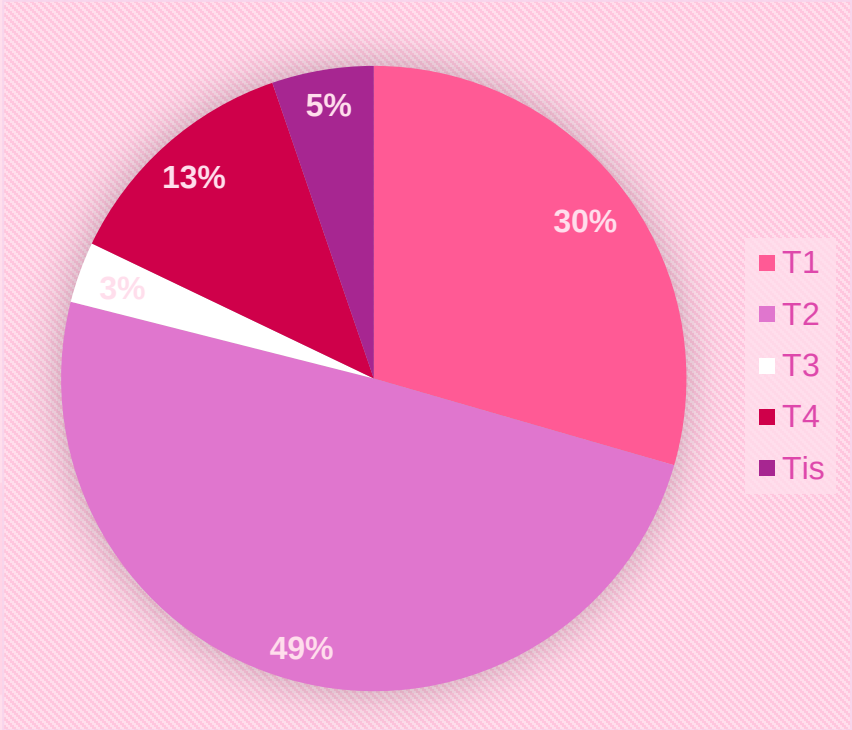

Table 3.2 Histopathology of the study population (N=95)

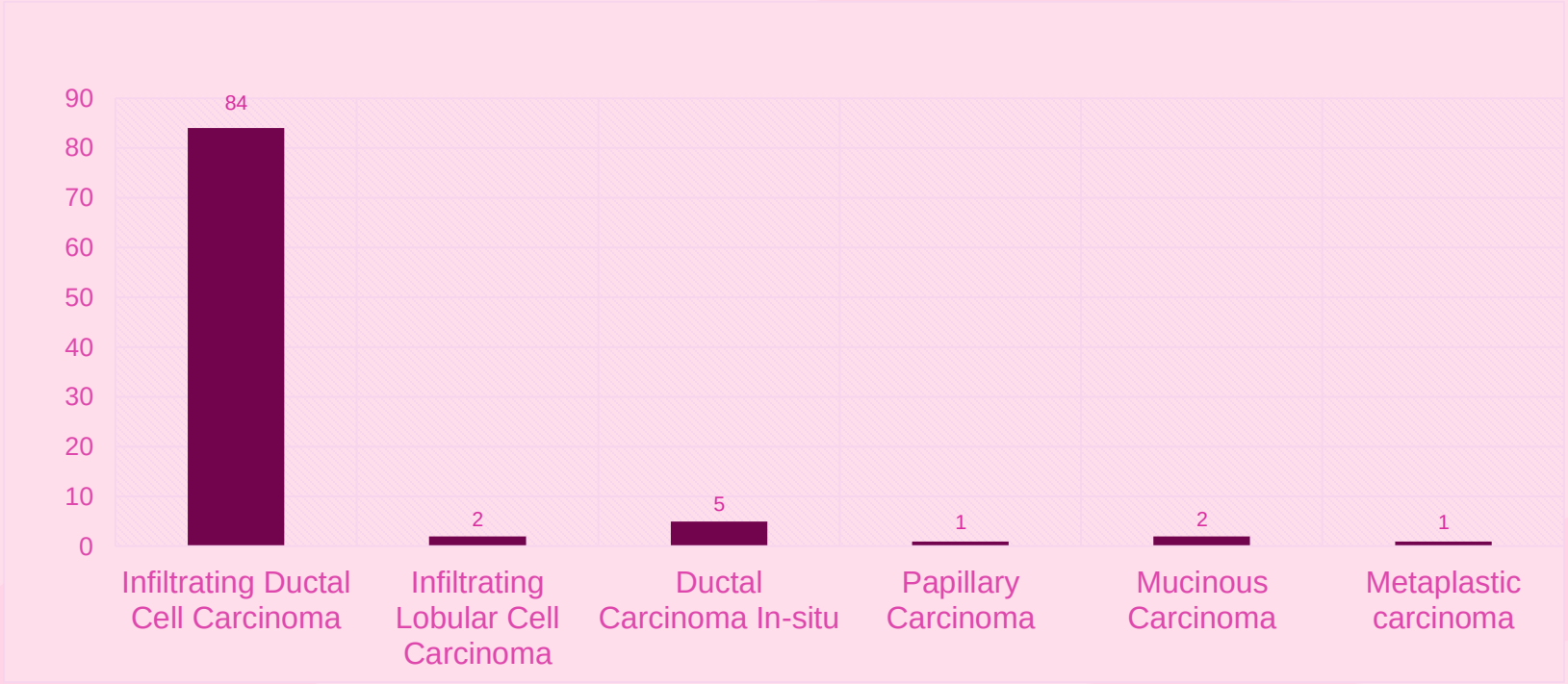

Table 3.3 Tumor grade of the study population (N=95)

Tumor Grade	Frequency	%
Grade I	7	7.37%
Grade II	72	75.79%
Grade III	9	9.47%

Table 3.4 Receptor status of the study population (N=95)

Receptor status	Frequency	%
Luminal A	28	29.47
Luminal B	35	36.84
Triple negative	16	16.84
HER2 enriched	14	14.74

Table 3.5 Types of operation of the study population (N=95)

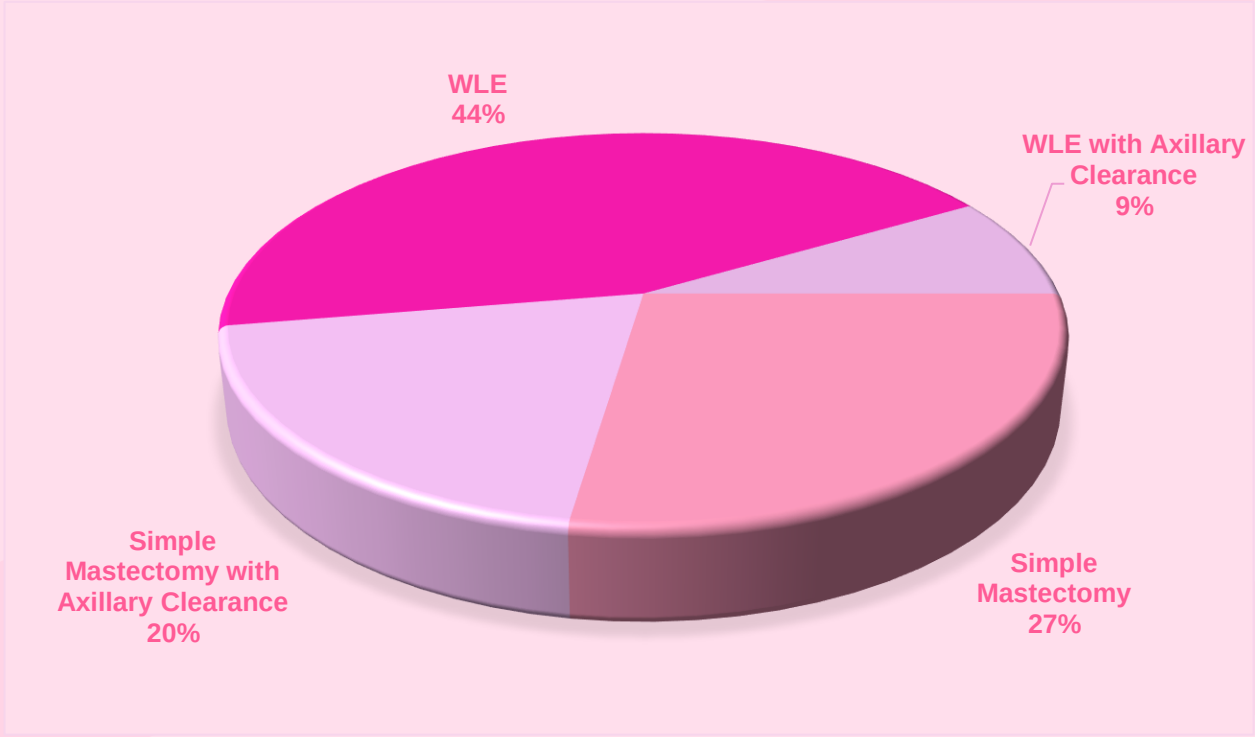

Table 3.6 Correlation between Sentinel Lymph node evaluation by Imprint Cytology and Frozen Section Biopsy with the final evaluation by Paraffin Section

	Evaluation of SLNs by paraffin section		*P value*
	Negative	Positive	
Evaluation of SLNs by imprint cytology			
Negative	65	3	<0.001
Positive	3	23	
Evaluation of SLNs by Frozen section			
Negative	67	0	<0.001
Positive	3	27	

Chi square test was done.

Result

- Diagnostic performance for axillary lymph node metastasis detection showed imprint cytology with 88.46% sensitivity and 95.59% specificity
- While frozen section demonstrated 100% sensitivity and 95.59% specificity

Conclusion

- **Imprint Cytology** is a **viable alternative** where **frozen section equipment** is unavailable, especially in **underdeveloped** or **rural settings**
- It is **simple, cost-effective,** and **accurate**, particularly with an **experienced cytopathologist**
- It enhances **intraoperative diagnosis** without **complex machinery**, making it **ideal for resource-limited hospitals**

Limitation

- Different Pathologist of various medical centres
- Single dye used in SLN detection

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Thank You