International Journal of Medical and Pharmaceutical Research
Website: https://ijmpr.in/ | Print ISSN: 2958-3675 | Online ISSN: 2958-3683
NLM ID: 9918523075206676
Volume: 4 Issue:5 (Sep-Oct 2023); Page No: 208-211

Original Article

IJMPR

Accuracy of Frozen Section Findings in Correlation with Surgical Pathology Diagnosis in an Institute

Dr. Jemeesha Zalavadiya[1], Dr. Arunima Banerji[2]*, Dr. Riddhi Jivrajani[3]

[1] Second year resident, Surat Municipal Institute of Medical Education and Research, Surat, Gujarat, 395010
[2] Professor and Head of department, Surat Municipal Institute of Medical Education and Research, Surat, Gujarat, 395010
[3] Second year resident, Pathology department, Surat Municipal Institute of Medical Education and Research, Surat, Gujarat, 395010

ABSTRACT

Background: Frozen section helps in rapid intra-operative diagnosis. It is performed to confirm malignancy, to know the organ of origin, to determine adequacy of margins, to detect lymphnode metastasis. Modification of surgery can be decided at the time of surgery on the table on the basis of frozen section findings.
Aims and Objectives: To assess the accuracy of frozen section findings in comparison to gold standard histopathological diagnosis and to find concordance and discordance rate of frozen section with histopathological report.
Methodology: This was a cross-sectional study of 81 frozen section samples done in the department of pathology of a tertiary care hospital from January 2022 to May 2023. All frozen section samples with their permanent tissue samples sent for final histopathological evaluation were included in the study.
Result: A total of 81 speciemens were analyzed, of which 79 specimens diagnosis were concordant and 2 specimens were discordant.
Conclusion: The accuracy of frozen section diagnosis at this tertiary care hospital can be interpretated as comparable with most international quality control statistics for frozen sections. The overall error rate and deferral rates are within the range of previously published studies. The results suggest specific measures should be taken to reduce the number of discrepancies.

Key Words: *Frozen section, Intra-operative diagnosis, Surgical pathology diagnosis*

***Corresponding Author**
Dr. Arunima Banerji*
Professor and Head of department, Surat Municipal Institute of Medical Education and Research, Surat, Gujarat, 395010

INTRODUCTION

The history of the frozen section as intra-operative consultation is intertwined with the development of pathology as a clinical specialty. Frozen section is performed to confirm malignancy, to know the organ of origin, to determine adequacy of margins, to detect lymphnode metastasis. Modification of surgery can be decided at the time of surgery on the table on the basis of frozen section analysis. The accuracy of frozen is "How reliable this method is when compared with histopathological diagnosis in paraffin-embedded tissue". Periodic review of the correlation is useful to identify the potential causes of errors and thus measures can be implemented to prevent similar occurrences.[1]

Aim and Objectives

- To assess the accuracy of frozen section findings in comparison to gold standard histopathological diagnosis
- To find concordance and discordance rate of frozen section with histopathological report

MATERIAL AND METHOD

It is a cross-sectional study conducted in Department of Pathology from January 2022 to May 2023. All the frozen section samples with their permanent tissue samples available for final histopathological evaluation were included in the study. Correlation of these both was done to assess the accuracy of frozen section findings. Samples for frozen section were sent in normal saline and permanent tissue samples were sent in formalin by the Department of Surgery, OBGY and ENT.[2]

Frozen section samples were immediately grossed, frozen at a temperature of -20 degree celsius and sectioned on a cryostat machine (SLEE cryostat MEV) at 3-6 micron thickness. These sections were stained by rapid Hematoxylin and Eosin method of staining. Frozen section reports were given within 30 minutes after submission of sample. For routine histopathological diagnosis, specimen were fixed in 10% formalin, grossed and adequate representative sections were

taken, paraffin emdedded and processed according to standard guidelines. Staining of these sections were done with conventional Haematoxylin and Eosin stain.[3]

All the frozen section and final histopathological diagnosis were reported by consultant pathologists. After comparison with the final histopathological reports, all the frozen sections were categorized into following categories.

Concordance: It was described as an adequate intra-operative frozen section study and complete diagnostic agreement with the permanent section.

Discordance: It was described as an adequate intra-operative frozen section study and diagnostic disaggrement with the permanent section.

The discordant cases were studied further to determine the reasons for discrepancies. The classification of errors were defined as follows:

1) **Gross sampling error:** The representative sampling from the lesion was missed during surgery.
2) **Microscopic sampling error:** The lesion was in the tissue which was sampled but was not revealed in the sections which were studied.
3) **Interpretation error:** The relevant tissue was in the frozen section slide, but the correct diagnosis was not made.
4) **Failure of communication:** The surgeon possessed information that probably would have changed the frozen section diagnosis, had it been communicated to the pathologist.[4]

Table 1: Organs submitted for frozen section

Organs Submitted	No. of cases n (%)
Margins	24 (30%)
Lymphnode	20 (25%)
GIT	13 (16%)
ENT	12 (15%)
OBGY	8 (10%)
Breast	2 (2.5%)
Urinary bladder	1 (1.25%)
Soft tissue	1 (1.25%)

RESULT

In a time period between January 2022 to June2023, 81 frozen-section were carried out.

The most common indications for which frozen section encountered in our institute were:[5]

i) Primary diagnosis
ii) Assessment of margins of tumor excision
iii) Assessment of nodal status

Table 2: Concordance rate of frozen section with histopathological reports

Site	Concordant	Discordant
Margins	24	0
Lymphnode	20	0
GIT	13	0
ENT	12	0
OBGY	6	2
Breast	2	0
Urinary bladder	1	0
Soft tissue	1	0
Total	**79 (97.5%)**	**2 (2.5%)**

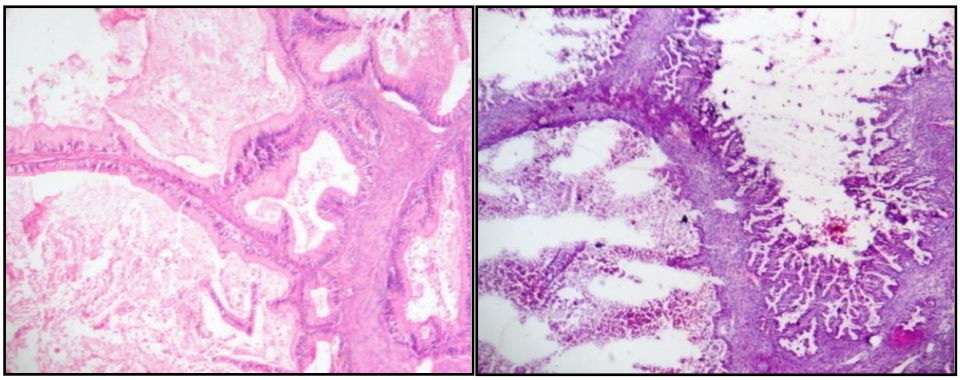

Figure 1: 10X view of rapid H&E stained slide of Frozen section and 10X view of routine H&E stained slide of Conventional histopathology section shows mucinous cystadenocarcinoma of ovary

Table 3: Neoplastic vs Non-neoplastic lesions on Frozen section

Specimen	Neoplastic	Non-neoplastic
Margins (24)	Positive for malignancy (3)	No evidence of malignancy of dysplasia (21)
Lymphnode (20)	Evidence of metastasis (3)	Reactive hyperplasia (2) Free from tumor cells (15)
Gall bladder (4)	Adenocarcinoma (2)	Inflammatory (2)
Colon (5)	Adenocarcinoma (1) GIST (1)	No evidence of malignancy (3)
Urinary bladder (1)	Benign etiology (1)	-
Breast (2)	Malignancy (2)	-
Thyroid (4)	Positive for malignancy (2) Benign cystic nodule (2)	-
Ovary (7)	Malignancy (2) Benign pathology (3)	Non-neoplastic (2) **These 2 were diagnosed as malignancy on routine HPE**

Table 4: Details of discordant cases

Sr. No.	Specimen	Frozen Section Findings	Histopathological diagnosis	Type of Error	Reason of Discrepancy
1	Ovarian mass	Torsion of ovary	Mucinous Neoplasm	Gross sampling error	Representative sample for frozen section was missed
2	Ovarian mass	No evidence of malignancy or dysplasia	Torsion of ovary with Benign serous cystadenoma with focal atypia(<5%)	Interpretation error	Due to extensive coagulative necrosis, stratification, pleomorphism and invasion can't be assesed

DISCUSSION

Frozen section is generally considered an accurate and reliable mode of diagnosis to assist the surgeon on the surgical procedure performed during the surgery itself. However, it is costly and technically limited; and thus available only in major hospitals that house sufficient staff who have the technical knowledge, skill and adequate equipment to perform the service. Frozen section is also more difficult to interpret than examination of paraffin-embedded sections. The procedure itself, even in the best hands of the medical laboratory technician, makes the lesion appear worse than a paraffin section of the fixed tissue would. Thus, a good and competent pathologist should know what to expect, what to look for and make a reasonable conclusion without being overtly "clever".[6]

A general diagnosis rather than an exact diagnosis should be given to assist the surgeon to proceed in choosing the best therapeutic approach for his patient. The frozen diagnosis can be fairly commented as inflammatory, benign or malignant rather than giving exact subtype, which hardly alter the diagnostic modality.[7]

Accuracy is above 90% in most studies and varies according to analyzed organ. Our study shows an accuracy of 97.5%; this falls within range of reported literatures. Deferral rate is 2.5% in this study. The most common reasons for deferral are inexperienced pathologist, sampling mistake by surgeon, technical imperfection during section cutting, poor staining quality, lack of clinical information about the case and error in interpretation. In our study, reasons for discrepancy were gross sampling error and interpretation error.

CONCLUSION

79 frozen section findings out of total 81 were concordant with final histopathological diagnosis. Hence, accuracy proved is 97.5%. 2 deferred diagnosis were of ovarian mass. The frozen section is an accurate and reliable method for tumor resection margins, metastasis of lymph nodes and tissue recognition. Methodological gross examination, accurate sampling by pathologist, avoiding technical errors in sectioning and staining, a interpersonal coordination with the operating surgeon can reduce the limitation and provide rapid and reliable for rapid diagnosis and on table patient management.

REFERENCES

1. J Nepal Med Assoc 2018;56(210):572-77
2. Kaufman Z, Lew S, Griffel B, Dinbar A(1986). Frozen-section diagnosis in surgical pathology. A prospective analysis of 526 frozen sections. Cancer. 1986;57(2):377–9
3. J Bras Patol Med Lab. 2018 Oct; 54(5): 319-324
4. International Journal of Research in Medical Sciences *Patil P et al. Int J Res Med Sci. 2015 Feb;3(2):399-404*
5. Raab SS, Tworek JA, Souers R, Zarbo RJ(2006). The value of monitoring frozen section-permanent section correlation data over time. Arch Pathol Lab Med;130(3):337–42
6. Abbasi F, Yekta Z, Aryan A(2012). Accuracy of Frozen Sections. Iranian Journal of Pathology; 7(1): 3-8
7. Jerome B. Taxy, Aliya N. Husain, Anthony G. Montag. Biopsy Interpretation: The Frozen Section; Page no.1-10