Original Research Article

Correlation between histopathology and frozen study of ovarian carcinoma

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A R T I C L E I N F O

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Introduction: To compare the frozen section results with definitive histopathological results of ovarian tumors diagnosed intra operatively at Saveetha medical college and hospital, Chennai.

Materials and Methods: In this study we compared the results of 30 cases of frozen histology with histopathological diagnosis at the department of pathology, Saveetha medical college and hospital, Chennai during July 2017-July 2018.

Results: A total of 30 cases were studied correlating the histopathological and frozen diagnosis of ovarian carcinoma. Out of which the diagnosis of 28 cases were concordant whereas diagnosis of 2 cases were discordant.

Conclusion: The frozen section is a very accurate method and it provides rapid results. Out of the 30 cases, 2 cases were discordant, which might have resulted due to any sampling errors, technical problem or intraoperative error. Appropriate measures should be taken to reduce error rates.

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1. Introduction

The frozen section procedure is a pathological laboratory procedure to perform fast microscopic analysis of a specimen. The technical name for this procedure is cryosection. Using this procedure

The accuracy of frozen section diagnosis concluded that for tumors that were clearly either benign or malignant the accuracy of the frozen section was good which was later confirmed by regular biopsy. On the contrary, where the frozen section diagnosis was a borderline tumor, the diagnosis was less accurate.

The frozen section is used to guide intraoperative or perioperative patient management as it provides rapid diagnosis. Thus it is used to provide a more efficient management to the patient.

Ovarian cancer is one of the most common cancer in women, especially women aged over 60 years.

Ovarian cancer mostly goes undetected until it has spread within the pelvis and abdomen. At the late stage, ovarian cancer is more difficult to treat but if it is detected in early stages, in which the disease is confined to the ovary, is more likely to be treated successfully.

The type of ovarian cancer is determined from the type of cell from where the cancer has begun.

WHO has classified ovarian tumours into 4 categories:

Epithelial tumours — it is the most commonest type of ovarian tumours

1. Germ cell tumours — it comprises 10-20% of ovarian tumours
2. Sex cord -stromal tumours — it comprises about 5% of ovarian tumours
3. Others

The cryostat is the instrument to freeze the tissue and additionally to chop the frozen tissue for microscopic section. The freezing of the tissue sample converts the water to ice. Within the tissue there is a firm ice which acts as embedding media to cut the tissue.

Periodic review of the correlation between the frozen section diagnosis and final diagnosis is useful to identify the potential causes of errors and thus measures can be implemented to help prevent similar occurrences.
guidelines will definitely help to reduce such occurrences. So strict guidelines should be followed to prevent these errors.

2. Methods and materials

The study was carried out in the Frozen Section and Histopathology Division of Department of Pathology, Saveetha medical college and hospitals, Chennai from July 2017 to July 2018. A total of 30 cases were taken.

Fresh tissue was sent to the frozen section room and the specimens were dissected and inspected. Optimal cooling temperature compound is used to cut out blocks on the cryostat. After which it is stained by hematoxylin-eosin staining. Immediately the frozen section diagnoses are informed to the concerned authorities.

The non-frozen tissues were then sent to the histopathological lab where it is fixed in 10% for malin solution and processed for routine paraffin section followed by hematoxylin-eosin staining on the next day and further reporting was done.

The impression of frozen histology and histopathology was compared and the accuracy and specificity of the frozen section reporting was determined in comparison to the routine histopathology reporting.

A total of 30 cases were taken and the histopathological and frozen section diagnosis were compared.

Correlation between the frozen diagnosis and histopathological diagnosis of ovarian carcinoma
Table 1:

| S. No | Hospital number | Age | Frozen histology                  | Histopathology                |
|-------|-----------------|-----|-----------------------------------|-------------------------------|
| 1     | 1608150092      | 55  | benign ovarian tumor              | fibroma of ovary              |
| 2     | 1608270035      | 53  | malignant mucinous adenocarcinma  | mucinous adenocarcinoma of ovary |
| 3     | 1609080023      | 39  | benign mucinous cystadenoma with hemorrhage | benign cystic teratoma |
| 4     | 1610060073      | 48  | bilateral high grade serous carcinoma of both ovaries | bilateral high grade serous carcinoma of both ovaries |
| 5     | 1611100010      | 17  | borderline mucinous tumor         | ovarian fibrothecoma          |
| 6     | 1408153236      | 47  | fibrothecoma of both ovaries      | mucinous boderline tumor      |
| 7     | 1701241013      | 50  | mucinous neoplasm                 | serous boderline tumor        |
| 8     | 1701040104      | 65  | serotol leydig cell tumor         | benign cystic teratoma        |
| 9     | 1608180045      | 17  | benign serous cystadenofibroma    | benign cystic teratoma        |
| 10    | 161100126       | 55  | benign serous cystadenofibroma    | benign cystic teratoma        |
| 11    | 1702090068      | 37  | benign cystic teratoma            | benign cystic teratoma        |
| 12    | 1702160036      | 43  | benign cyst probably serous cystadenoma | mixed malignant germ cell tumor |
| 13    | 1702240120      | 29  | mucinous cystadenoma of ovary     | benign mucinous cystadenoma of right ovary |
| 14    | 1703150078      | 60  | mucinous cystadenoma of ovary     | benign mucious cystadenoma     |
| 15    | 1703130006      | 63  | benign mucinous cyst               | benign serous cystadenoma of ovary |
| 16    | 1703170010      | 52  | benign serous cystofibroma        | serous boderline tumor        |
| 17    | 1703250014      | 53  | benign cystic teratoma            | benign cystic teratoma        |
| 18    | 1704070185      | 64  | benign serous cystadenofibroma    | benign cystic teratoma        |
| 19    | 1703160043      | 49  | benign mucinous cystadenoma of ovary | benign serous cystadenoma of ovary |
| 20    | 1704270119      | 70  | benign serous cystadenoma of ovary | benign serous cystadenoma of ovary |
| 21    | 1705080235      | 44  | serotic leydig cell tumor         | right ovary lipid cell tumor  |
| 22    | 1706271109      | 46  | granulosa cell tumor              | adult granulosa cell tumor of right ovary |
| 23    | 1710091009      | 23  | benign mucinous cystadenoma       | benign mucious cystadenoma of ovary |
| 24    | 1803280018      | 21  | benign papillary serous cystadenofibroma | benign serous cystadenofibroma of ovary |
| 25    | 1804140042      | 60  | benign mucinous cyst               | benign mucious cystadenofibroma |
| 26    | 1805310297      | 45  | benign fibrothecoma ovary         | benign ovarian fibroma of left ovary |
| 27    | 1807120042      | 50  | atypical proliferative mucinous tumor | boderline mucinous tumor |
| 28    | 1810030254      | 28  | benign mucinous cystadenoma of ovary | benign mucious cystadenoma of ovary |
| 29    | 1809060530      | 37  | benign serous cystadenoma of ovary | benign serous cystadenoma of ovary |
| 30    | 1811220032      | 50  | serous carcinoma of ovary         | highgrade serous ca rcinoma of ovary |

3. Discussion

The histopathological section diagnosis of all 30 ovarian specimens revealed 66.66% benign tumours and 33.34%malignant tumours. The final frozen section revealed 60% benign tumours and 40% malignant tumours.

The overall accuracy rate of frozen section analysis is 93.33%. However there is a failure rate of 6.67%. The 6.67% negative results could have occurred due to any sampling errors.

These findings are in concordance with that of Chandramouleeswari K. et al.\textsuperscript{12} and Shrestha S. et al.\textsuperscript{2} They have reported the accuracy rates as 92% and 94.6%respectively. But the study of Junn-Liang et al.\textsuperscript{13} and Farah- Klibi F. et al.\textsuperscript{14} Showed slightly higher accuracy rates of 97.7% and 97.5% respectively. These showed a relative decrease in the negative results.

In one case, benign ovarian tumor reported on frozen section turned out to be fibroma of ovary on conventional
paraffin section.\(^\text{15}\)

In another case, it was reported as benign serous cystofibroma on frozen section but it turned out to be serous borderline tumor on paraffin section.

Sometimes these kind of negative results can also be observed.\(^\text{5}\) The negative diagnosis was due to the error by the pathologist which may have resulted due to the method of freezing, type of procedure, type of lesion etc.

Appropriate measures and strict guidelines would help to reduce the failure rates.

4. Conclusion

Intraoperative frozen section diagnosis appears to be an accurate technique for the histopathological diagnosis of ovarian tumours. The results can be used to guide the surgery. Frozen diagnosis can provide rapid, reliable, cost effective information necessary for optimum patient care.\(^\text{16}\)

Evaluation of the frozen section diagnosis and histopathological diagnosis should be carried out regularly for more efficient management of ovarian tumors.

The diagnostic accuracy of frozen section as an important source of information in surgical procedure is important not only in the management of surgical patients but also as a measure of quality control in surgical pathology.\(^\text{17}\)

To reduce error rates and to improve frozen section diagnosis, continues monitoring in the pathology department should be done. This should be done on a regular basis to attain better results.\(^\text{18}\)

This correlation between the histopathological diagnosis and frozen section diagnosis is definitely very useful to identify the tumours.

5. Source of Funding

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6. Conflict of Interest

None.

References

1. Raab SS, Tworek JA, Souer R, Zarbo RJ. The value of monitoring frozen section-permanent section correlation data over time. Arch Pathol Lab Med. 2006;130(3):337–42.
2. Shrestha S, Lee MC, Dhakal H, Pun CB, Pradhan M, et al. Comparative Study of Frozen Section Diagnosis with Histopathology. Postgraduate Medical Journal of NAMS. 2009;3(2):1–5.
3. Khoo H. An audit of intraoperative frozen section in Johor. Med J Malaysia. 2004;59(1):50–5.
4. Shah J, Mackelvie M, Gershenson DM. Accuracy of Intraoperative Frozen Section Diagnosis of Borderline Ovarian Tumors by Hospital Type. J Minim Invasive Gynecol. 2018;Epip ahead of print. PMC free article. PubMed] [Google Scholar.
5. Abbasi F, Yeka Z, Aryan A. Accuracy of Frozen Sections. Iranian JPathol. 2012;7(1):3–8.
6. Din N, Memon A, Iedess R, Ahmad Z, Hasan S. Central nervous system lesions: correlation of intraoperative and final diagnoses, six year experience at a referral centre in a developing country Pakistan. Asian Pac J Cancer Prev. 2011;12(6):1435–7.
7. Howanitz PJ, Hoffman GG, Zarbo RJ. The accuracy of frozen-section diagnoses in 34 hospitals. Arch Pathol Lab Med. 1990;114(4):355–9.
8. Novis DA, Zarbo RJ. Interinstitutional comparison of frozen section turnaround time. A College of American Pathologists Q-Probes study of 32868 frozen sections in 700 hospitals. Arch Pathol Lab Med. 1997;121(6):559–67.
9. Sukumaran R, Somanathan T, Mathews A. Role of frozen section in intraoperative assessment of ovarian masses: a tertiary oncology center experience. Indian J Surg Oncol. 2014;5(2):99–103. PMC free article. PubMed] [Google Scholar.
10. Intra-operative frozen section consultation: concepts, applications and limitations. Malays J Med Sci. 2006;13(1):4–12.
11. Tempfer CB, Polterauer S, Bentz EK. Accuracy of intraoperative frozen section analysis in borderline tumors of the ovary: a retrospective analysis of 96 cases and review of the literature. Gynecol Oncol. 2007;107(2):248–52. PubMed [Google Scholar.
12. Chandramouleswari K, Yoganbal M, Arunalatha P, Bose JC, Rajendran A. Frozen and paraffin sections- Comparative study highlighting the concordance and discordance rates in a tertiary care centre. IOSR J Dent Med Sci. 2013;12(5):26–30.
13. J-L C, Tseng HH, Sheu LF, W-H L, Tu YC. Diagnostic Accuracy of Frozen Sections in surgical Pathology- A Retrospective Analysis of 1084 Frozen Sections. J Med Sci. 1992;13(2):133–42.
14. Farah-Klibi F, Neji O, Ferjaoui M, Zaouche A, Koubaa A, et al. Accuracy of frozen section diagnosis: an analysis of 1695 consecutive cases. Tunis Med. 2008;86(7):693–7.
15. Houck C, Nikru N, Duska L. Borderline tumors of the ovary: correlation of frozen and permanent histopathologic diagnosis. Obstet Gynecol. 2000;95(6):839–43. PubMed [Google Scholar.
16. Taxy JB. Frozen section and the surgical pathologist: a point of view. Arch Pathol Lab Med. 2009;133(7):1135–8.
17. Oh S, Lee KR, YK. Clinicopathological aspects of patients with recurrence of borderline ovarian tumors. Obstet Gynecol Sci. 2015;58(2):98–105. PMC free article. PubMed [Google Scholar.
18. Koensgen D, Weiss M, Assmann K. Characterization and management of borderline ovarian tumors - results of a retrospective, single-center study of patients treated at the department of gynecology and obstetrics of the university medicine Greifswald. Anticancer Res. 2018;38:1539–45. PubMed [Google Scholar.

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