

Study of Frozen Section and Lymph Node in Management of Mucinous Ovarian Tumors

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ABSTRACT

Introduction: Misdiagnosis of histologic type on frozen section could result in incomplete surgical staging of a more aggressive ovarian cancer, ultimately leading to an inability to prognosticate, inappropriate treatment, need for repeat surgery, and decreased survival. Study aimed to investigate the discordance rate of the frozen section with final pathology in the diagnosis of mucinous histology in ovarian tumors.

Material and Methods: In this retrospective study cases of mucinous ovarian tumor on frozen section or final pathology were included from 2012 to 2018. Cases reporting a mucinous the ovarian tumor on frozen section or final pathology were identified. Frozen section results were compared with final diagnosis to calculate concordance rates.

Results: Of the 38 cases reported to be mucinous on frozen section, 36 had mucinous histology confirmed on final pathology (94.7% concordance). Among the 36 mucinous tumors found to be concordant in mucinous histologic type on frozen section and final pathology, there was a 61.1% (22/36) concordance rate on the classification of malignancy. Lymph node dissection was performed in 12 of the 38 cases reported to be mucinous on frozen section.

Conclusion: All of these distinctions provide significant evidence that mucinous ovarian tumors should be approached surgically as a distinct entity.

Keywords: Mucinous, Ovarian cancer, Frozen section, Pathology

INTRODUCTION

Mucinous tumors account for 36% of the existing ovarian tumors (OT) and they are a part of the surface epithelial-stromal group of ovarian neoplasms. 75% of the ovarian tumors are benign, 15% of them are malignant and the remaining 10% becomes borderline.¹ Benign tumors are usually multilocular and cystic lined by epithelium that resembles the endocervical and gastrointestinal type epithelium. Low malignant potential (LMP) or Borderline, malignant and metastatic mucinous ovarian tumors have papillae and solid areas and may be haemorrhagic and necrotic. Surgery has a pivotal role in the treatment of ovarian tumors alongside adjuvant chemotherapy with a taxane, 5-FU and radiation therapy.² Intraoperative frozen sections (FS) of mucinous ovarian tumors helps to identify the features and aids in accurate diagnosis and staging of the tumor and helps the surgeon to decide on the need for further additional surgeries.

Surgery in ovarian tumors is done for biopsy, excision, palliative surgery to relieve symptoms and for debulking. FS of ovarian lesions together with patient's age, relevant

clinical history, histopathological reports and serum markers like AFP, CEA, CA125, HCG, CA19.9, oestrogen and androgen levels and imaging studies eliminates inappropriate diagnosis and assists the gynaecological surgeon in reading intramural nodules, papillary excrescences, solid component or benign cystic component.³

Studies and authors have confirmed that there will not be any occult nodal metastasis in MOT that is grossly limited to the ovaries. The primary purpose of an intraoperative FS is to provide the surgeon with adequate information that enables him to perform the most accurate treatment along with proper communication with the pathologist. Accuracy in FS in OT is estimated to be 91% to 97%.⁴ Frozen section helps to distinguish primary from metastatic tumors but the most common problems being a distinction of borderline serous or mucinous tumors from serous or mucinous carcinomas and subclassification of a primary malignant tumor. This study is aimed at evaluating the concordance rate and reliability of frozen section with histopathology in the diagnosis of MOT. Study aimed to investigate the discordance rate of the frozen section with final pathology in the diagnosis of mucinous histology in ovarian tumors.

MATERIAL AND METHODS

In this retrospective study cases of mucinous ovarian tumor on frozen section or final pathology were included from 2012 to 2018. Cases were excluded from the study if they had a prior diagnosis of gynecologic or GI cancer, if the reported mucinous ovarian tumor was an incidental finding at the time of surgical evaluation or management of a different tumor, or if no frozen section was performed. patient and disease characteristics including frozen section and final pathology diagnoses, lymph node pathology results, age, body mass index (BMI), tumor size, tumor laterality, and tumor markers.

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At this institution, intraoperative frozen section consultation consists of a gross and microscopic examination of the submitted tissue. Ovarian tumors are measured and bread-loafed (sliced) into approximately 1-cm thick slabs. Areas with gross findings suspicious for malignancy, such as solid areas of cysts, are sampled, and a 3-mm portion is frozen. The tissue is embedded in an optimal cutting temperature medium, and two 5 K sections are cut and stained with hematoxylin and eosin, and then evaluated by the pathologist assigned to the frozen section service. Either 1 or 2 sections of the specimen are frozen and evaluated in this process, depending on the discretion of the pathology attending and the size and appearance of the mass. The remnant of the frozen tissue is submitted for permanent processing, and the specimen is grossed per standard protocols, with 1 to 2 sections submitted for every centimeter of the tumor. These sections are evaluated by hematoxylin and eosin staining, as well as special studies when appropriate.

RESULTS

Of the 46 cases, 38 were reported to be mucinous tumors on frozen section, whereas the other 8 cases were reported on a frozen section to have serous histology or no specific histologic type. Of the 38 cases reported to be mucinous on frozen section, 36 had mucinous histology confirmed on final pathology (94.7% concordance). Among the 36 mucinous tumors found to be concordant in mucinous histologic type on frozen section and final pathology, there was a 61.1% (22/36) concordance rate on the classification of malignancy. There were 21 cases reported as benign on the frozen section: 16 of these cases were ultimately confirmed as benign tumors on final pathology (76.1% concordance), whereas 4 were upgraded to borderline classification (19.1%) and 1 was upgraded to malignant classification (4.8%). There were 10 cases reported as borderline on the frozen section: 6 of these cases were confirmed as borderline tumors on final pathology (60% concordance), whereas 1 was downgraded to benign classification (10%) and 3 were upgraded to malignant classification (30%). There were 3 cases reported as malignant on the frozen section: 2 of these cases were confirmed as malignant on final pathology (66.6% concordance), whereas 1 was downgraded to borderline classification (33.4%). There were 2 cases with the

classification of malignancy deferred on the frozen section: 1 of these cases was diagnosed as malignant on final pathology (50%), 1 was diagnosed as borderline (50%) (table-1). Lymph node dissection was performed in 12 of the 38 cases reported to be mucinous on frozen section. All 12 of these cases had pelvic lymph nodes dissected, and 8 of these cases also had para-aortic lymph nodes dissected. The mean numbers of pelvic and para-aortic lymph nodes removed were 6 and 3, respectively. Lymph node dissections were performed based on the surgeon's intraoperative assessment and judgment.

DISCUSSION

Frozen section is a valuable diagnostic procedure for categorization of mucinous ovarian tumors and acts as a guide in tailoring surgical therapy especially in women of reproductive age. A retrospective study of intraoperative frozen sections for ovarian tumors held at Kidwai Memorial Institute of Oncology, Karnataka states that the overall accuracy of FS is 84.25% in determining malignancy. The sensitivity and specificity were respectively 90.4% and 82.6% for benign tumors and 91.5% (highest) and 98.2% for malignant tumors. Lowest sensitivity of 31.4% with a specificity of 94% was observed in borderline tumors.⁵ Many studies concur that FS is accurate for diagnosis of benign and malignant tumors but the accuracy rates are low in the case of borderline tumors.⁶⁻⁸ This is primarily because of the differences in the clinical size of the tumor and the amount of tissue used for the evaluation of histopathology.⁹ The 3 cornerstones of intraoperative diagnosis are the patient's clinical history, gross examination of the tumor and the microscopic morphologies. All these results, together with diagnostic imaging studies should be prepared well in advance to performing an FS to avoid time pressure. The gross parameters to be considered are the tumor size, laterality(unilateral/bilateral) and the cut surface appearance(cystic/solid) of the tumor. Misdiagnosis often occurs because malignant OT is solid and often soft and fleshy and also have a heterogenous cut surface filled with hemorrhage and necrosis in comparison with the benign tumors like adenofibromas and Brenner tumors which may also have a partially or fully solid cut surface. The surgeon must note for the presence of intracystic papillary growth

Frozen Section Results	Final Pathology Results	Concordance Rates	Discordance Rates
Benign mucinous tumor	Benign mucinous tumor	76.10%	
	Borderline mucinous tumor		19.10%
	Malignant mucinous tumor		4.80%
Borderline mucinous tumor	Benign mucinous tumor		10%
	Borderline mucinous tumor	60%	
	Malignant mucinous tumor		30%
Malignant mucinous tumor	Benign mucinous tumor		0%
	Borderline mucinous tumor		33.40%
	Malignant mucinous tumor	66.60%	
Deferred	Benign mucinous tumor		0%
	Borderline mucinous tumor		50%
	Malignant mucinous tumor		50%

Table-1: Frozen section and final pathology concordance rates

which is scattered and firm as in the case of cystadenofibroma in contrast to the intraluminal projections of borderline serous tumors which are soft, friable and abundant.¹⁰

Often the surgeon is left with difficulty in making decisions about the extent of the margin of the surgery with poor and incomplete knowledge of the tumor histology. As most of these tumors are often unilateral and in early stage a patient with disease limited to a single ovary can undergo the fertility-sparing procedure with no compromise on the prognosis. And moreover patients with borderline or invasive components must be subjected to a staging procedure to exclude the presence of occult extra-ovarian disease because this will alternate the prognosis and also might require adjuvant therapy.

Staging in MOT should be done after a thorough evaluation of the peritoneal samplings and biopsies, pelvic washings and infracolic omentectomy. Pelvic and para-aortic lymph node samplings are not warranted and not considered as part of the staging procedure.¹¹ Most studies favour that lymph node metastasis in MOT is not present and LND may not be required for disease staging.¹² The overall accuracy of FS diagnosis in OT reported from numerous studies range from 73.8% to 98.7%¹³⁻¹⁴ and this study showed an accuracy rate of 94.7% which is comparable with the accuracy rates mentioned in the literature.

CONCLUSION

This study concludes that a preoperative diagnosis of the nature of an OT is not always a reliable and intraoperative frozen section of MOT proves to be a concordant test for accurate diagnosis of benign and malignant OT but has implications in determining the extent of the lesion, the accuracy rates for borderline tumors are however low. Therefore suitable cautions must be exercised in determining the extent of surgery in correlation with clinical scenarios in order to prevent underdiagnosis thereby leading to undertreatment or overtreatment in borderline cases especially in women who prefer to be fertile.

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