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STUDY OF INTRAOPERATIVE FROZEN SECTION IN THE DIAGNOSIS OF OVARIAN TUMORS: A TERTIARY ONCOLOGY CENTER EXPERIENCE.

Oncopathology

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ABSTRACT

Introduction: Ovarian neoplasm represents the sixth most commonly diagnosed cancer among women in the world and causes more deaths per year than other causes of the female reproductive system.

Objectives: Accuracy of intraoperative frozen section in comparison with histopathology in the diagnosis of the ovarian neoplasm to decide the extent of surgery.

Materials and method: Hospital-based retrospective study was done on 178 patients admitted to the department of Gynecology and Obstetrics. The Gujarat Cancer & Research Institute, Ahmedabad, they were clinically and radiologically diagnosed to have ovarian neoplasm from October 2016 to October 2017.

Results: Intraoperative frozen section diagnosis of all 178 ovarian specimens revealed 103 (57.3%) benign tumors, 16 (8.9%) borderline tumor, 59 (33.1%) malignant tumors. The final paraffin section diagnosis revealed 57% benign tumors, 7.8% borderline tumors, 34.8% were malignant tumors. The overall accuracy of frozen section analyses is 90%. The sensitivity and specificity for benign, borderline and malignant tumors are 100%, 92.8%, 95.1% and 98.6%, 98.1%, 100% respectively.

Conclusion: Intraoperative frozen section diagnosis appears to be an accurate technique for the histopathologic diagnosis of ovarian tumors. The can be used to guide the type and extent of Surgery, especially with experienced Pathologists. However, limitations in the use of the frozen section must be recognized such as large specimens, especially mucinous subtype. Regular re-evaluation & consultation concerning disagreements between frozen section diagnosis and final permanent paraffin diagnosis should be conducted by both surgeons and pathologists as part of quality assurance to determine the most appropriate intraoperative management for a patient with ovarian tumors.

KEYWORDS

Frozen Section, Ovarian Tumors, Accuracy

INTRODUCTION:

Ovarian neoplasm is one of the leading causes of morbidity and mortality among gynecological cancer and the fifth most important cause of cancer death among women. Correct intraoperative histopathological diagnosis in the way of the frozen section is imperative to ensure proper surgical staging and is carried out before performing definitive surgery to present overtreatment or under-treatment of patients with ovarian neoplasm. (1)

Discrimination of benign and malignant tumors during surgery in gynecologic patients with adnexal masses is important for the management of the patient. (2,3) Intraoperative frozen section analysis gives information about the characteristics of the masses. (4-6) The results of the frozen examination determine the course of surgery. (7-9) When malignant frozen section results are obtained, the surgical field widens and staging is performed; this may involve total abdominal hysterectomy, bilateral salpingo-oophorectomy, pelvic and Para-aortic lymphadenectomy, omentectomy, appendectomy or multiple peritoneal biopsies. (1) Benign or borderline frozen section results limits the surgery to oophorectomy or cystectomy. Particularly for young patients, the diagnostic accuracy of frozen section results is critical for fertility conserving surgeries. (10,11) The consequences of over diagnosis may include unnecessary surgical intervention and increased morbidity and mortality. Alternatively, under diagnosis is associated with the secondary operation and tumor spread.

AIMS & OBJECTIVES

- To study& compare frozen section diagnosis with final histopathological diagnosis in ovarian neoplasm.
- To evaluate the accuracy of frozen section in ovarian neoplasm.
- To study clinical-radiological findings & its correlation with frozen section diagnosis.

MATERIAL & METHOD

In this study, we retrospectively evaluated the definitive histopathological results of 178 patients at the pathology department of the Gujrat Cancer & Research Institute, who underwent surgery between October 2016 and October 2017 for ovarian masses and on whom frozen section was performed. Each specimen collected from the operation site was transferred to the histopathology department with the patient's clinical details as soon as possible. The size and the presence of surface irregularities and vegetations were then macroscopically evaluated. Two to five samples were taken from suspicious areas that were frozen, cut into 5-µm sections and stained with hematoxylin and eosin. Both frozen and paraffin sections were examined by expert pathologists. The results were classified into three groups namely benign, malignant and borderline. Then the results or frozen sections and paraffin blocks were compared. False-positive (malignant or borderline frozen result, but benign paraffin blocks result) and false- negative (benign frozen result but malignant or borderline paraffin-block result) results were examined. Cases with borderline frozen results and malignant paraffin-block results or with malignant frozen results and borderline paraffin – block results were also evaluated. Sensitivity, specificity, positive predictive values and negative predictive values of each group (benign, borderline and malignant) were assessed.

RESULTS

Intraoperative frozen section diagnosis of all 178 ovarian specimens revealed 103 (57.3%) benign tumors, 16 (8.9%) borderline tumors, 59 (33.1%) malignant tumors. The final paraffin section diagnosis revealed 102 (57.2%) benign tumors, 14 (7.8%) borderline tumors, 62 (34.8%) malignant tumors. The overall accuracy of frozen section analyses is 90%.

The sensitivity and specificity for benign, borderline and malignant tumors are 100%, 92.8%, 95.1% and 98.6%, 98.1%, 100% respectively. The positive predictive value (PPV) and negative predictive value (NPV) for benign, borderline and malignant tumors are 99%, 81.2%, 100% and 100%, 99.3%, 97.4% respectively.

DISCUSSION

In this study, Sensitivity for benign tumors was 100% which is the same as in Arikan et al (13). Only 1 of 103 diagnosed benign cases on the frozen section turned out to be borderline on final histopathology may be due to sampling error.

In this study sensitivity for borderline tumors was 92.8% while Arikan et al show sensitivity for borderline 77.8%. Three cases out 16 borderlines diagnosed by frozen section turned out to be malignant on

histopathology. In a large borderline tumor, there may be only a few foci of invasive malignancy that may be missed on frozen, requiring extensive sampling. Hence such areas are finally identified on final paraffin block H & E examination. The large tumor size and multilocular pattern of mucinous tumors are reported to have a negative effect on the accuracy of frozen section diagnosis. (3-5,9) Multivariate analysis found that the mucinous type was the only independent factor in the misdiagnosis of borderline neoplasms. Under diagnosis may be due to sampling errors, lack of expert pathologists, less information regarding tumors status.

In this study sensitivity for malignant tumors was 95.1% while Arikan et al shows 71.4% sensitivity for malignant tumors. In this study, all 59 cases diagnosed as malignant on frozen turned to be malignant on final histopathology. Frozen section missed 3 cases of malignancy, which were reported as Borderline due to the absence of invasive foci, which was later picked up by extensive sampling on the final H & E examination.

Thus overall accuracy for frozen section in diagnosis of ovarian neoplasm is ~97% in this study.

CONCLUSION

Intraoperative frozen section is generally accurate, it can be one piece of evidence for the surgeon to use in determining the type and extent of initial surgery to be performed. However, frozen section has limitations such as sampling error, differed diagnosis, and interpretation error. Good intraoperative coordination between surgeons and pathologists and regular clinic pathological conferences, especially in cases with a discordant diagnosis can maximize accuracy and minimize limitations such as interpretation error and differed diagnosis.

Table 1: The distribution definite histopathology diagnosis of all ovarian tumors

	Final HP diagnosis	No. of cases (%)
1	Surface epithelial tumors	124 (69.7)
2	Sex cord-stromal tumors	28 (15.7)
3	Germ cell tumors	19 (10.7)
4	Miscellaneous tumors	05 (2.8)
5	Secondary tumors	02 (1.1)
	Total	178 (100)

Table 2: Distribution of frozen section and histopathological diagnosis in various categories of ovarian neoplasms

Category	Frozen section, Number of cases (%)	HP Diagnosis, Number of cases (%)
Benign Tumors	103 (57.9)	102 (57.3)
Borderline Tumors	16 (8.9)	14 (7.9)
Malignant Tumors	59 (33.2)	62 (34.8)
Total Cases	178 (100)	178 (100)

Table 3: Reports differing

Sr No.	Frozen Section	Histopathology	Cases
1.	Mucinous neoplasm-Borderline	Mucinous adenocarcinoma, well differentiated	1
2.	Serous papillary tumor-Borderline	Serous papillary cystadenocarcinoma, well-differentiated	1
3.	Mucinous neoplasm-Borderline	Mucinous cystadenocarcinoma, well Differentiated	1
4.	Benign mucinous cystadenoma-endocervical type	Borderline mucinous tumor- endocervical type	1

Table 4: Frozen section accuracy

	Benign	Borderline	Malignant
Sensitivity	100%	92.8%	95.1%
Specificity	98.6%	98.1%	100%
PPV	99%	81.2%	100%
NPV	100%	99.3%	97.4%

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