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Utility Of Frozen Section In Diagnosing Ovarian Tumors- Report of 30 cases.

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Abstract

Ovarian cancer is the 7th leading cause of cancer deaths among women worldwide. Most of the cases are diagnosed in the advanced stage that requires aggressive surgical management. Intraoperative pathology consultation is often required to decide the nature and extent of tumor which can be done by imprint, scrape cytology and frozen section. These methods are less accurate as compared to frozen section as it gives rapid diagnosis, can be used for enzyme immunohistochemistry and immunofluorescence study.

Keywords: Imprint, Immunohistochemistry, Immunofluorescence, Frozen, Scrape

Introduction

Ovaries are paired organs located on each side of the uterus within the pelvis, which serves as a frequent and intricate site for neoplasm in women. Ovarian tumor is the sixth most common type of cancer and the seventh highest contributor to cancer-related fatalities in women worldwide. (1)

Factors contributing to an elevated risk of ovarian cancer include aging, nulligravida and a family history of the disease. The incidence of ovarian cancer is uncommon before the age of 40 but rises steadily afterward, reaching its peak around the time of menopause. (2) Ovarian tumors are often referred to as the 'silent killer' due to their nonspecific symptoms and the absence of reliable early detection screening. (3)

The detection of ovarian tumors depends on various signs and symptoms, abdominal and vaginal ultrasound examinations, doppler assessment of tumor blood flow, and biochemical examination involving tumor markers such as CA125, B-hcg, and alpha-fetoprotein. Diagnosis typically occurs in advanced stages, necessitating aggressive surgical intervention.

During surgery, ovarian lesions can be diagnosed using various cytological techniques such as imprint, scrape cytology, and intraoperative fine-needle aspiration cytology (FNAC). However, these methods exhibit lower accuracy when compared to frozen section analysis. Definitive diagnosis and staging require surgical intervention and histopathological examination (4)

The use of intraoperative frozen section for diagnosis of ovarian tumors is helpful in guiding surgical decisions and subsequent evaluations. Hence, the accuracy of this technique holds significant importance. Frozen section accuracy in distinguishing between benign and malignant ovarian tumors is typically high. Thorough intraoperative evaluation of the tumor, particularly those with solid components will contribute to achieving a high rate of accuracy. Hence, our aim is to investigate the diagnostic precision of frozen section and compare it with histopathology for ovarian tumors.

Materials And Methods:

After the approval of the Institutional Ethics Committee, an informed written consent was taken from the patient. This research was undertaken in Department of Pathology at a Tertiary Care Hospital.

Total 30 fresh, unfixed surgically resected specimens of ovarian tumors received in the Pathology Department were studied. Clinical details and investigations of the patients were obtained from the patient's case records and by direct interview.

For frozen section, the representative bits from the fresh unfixed ovarian tumor were chosen and immediately processed in TN9000 Cryostat and stained with haematoxylin and eosin. The thickness of the sections ranges from 1-90 micrometre (adjustable). The TN9000 Semi-automatic cryostat microtome is a medical device used for rapid freezing of pathological sections of human tissue. It is widely used for pathological diagnosis, analysis and research in hospitals.

The temperature of chamber is -10 degree Celsius to-35 degree Celsius (adjustable).

The report of frozen section was given in 20-30 minutes.

The specimen was then fixed in 10%formalin overnight and sampled for routine histologic sectioning and processing. All the sections were studied microscopically under low and high power and categorized accordingly. The diagnosis obtained by frozen section based on cellularity and cell morphology were compared with final histopathological diagnosis. The histologic diagnosis of ovarian tumors is the gold standard and is based on WHO classification.

Results:

Out of the 30 patients enrolled in this study, frozen section analysed 11 cases as malignant, 18 as benign, and 1 as a borderline tumor, findings were subsequently confirmed by histopathology.

TABLE 1: Age Wise Distribution of Ovarian Tumors.

AGE RANGE (years)	BENIGN (no. of cases)	BORDERLINE (no. of cases)	MALIGNANT (no. of cases)
<10	0	0	0
11-20	2	0	0
21-30	4	0	1
31-40	4	1	2
41-50	7	0	1
51-60	0	0	5
60-70	1	0	2
Total	18 (60%)	1(3.33%)	11 (36.66%)

TABLE 2: Distribution of cases according to nature of tumour & histopathological diagnosis

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Histopathological diagnosis	Nature of tumor	Types	No. of cases	%
Surface epithelial-stromal tumor	Serous	Benign	13	43.33
		Borderline	0	0
		Malignant	7	23.33
	Mucinous	Benign	3	10
		Borderline	1	3.33
		Malignant	0	0
	Endometroid	Benign	0	0
		Borderline	0	0
		Malignant	0	0
	Transitional cell tumor	Benign	0	0
		Borderline	0	0
		Malignant	0	0
Sex cord- stromal tumor	Granulosa cell tumor		3	10
	Fibroma		2	6.66
	Sertoli-Leydig cell tumor		0	0
	Other sex cord stromal tumors		0	0
Germ cell tumor	Teratoma		1	3.33
	Dysgerminoma		0	0
	Yolk-sac tumor		0	0
Total			30	100

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SEROUS CYSTADENOMA

Fig1.a: Gross specimen showing a thin walled cyst containing serous fluid.

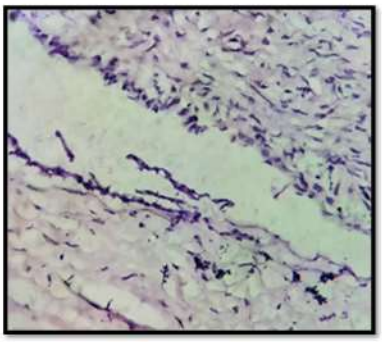

Fig1.b:(H&E,40X) Frozen section - Cyst wall lined by cuboidal epithelium

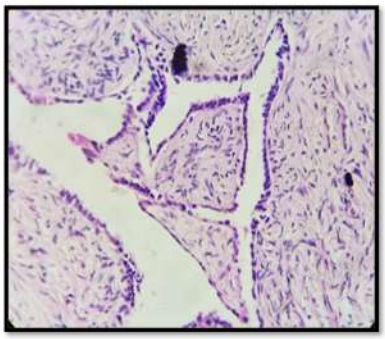

Fig1.c (H&E,40X): Histopathology- Cyst wall lined by cuboidal epithelium.

BORDERLINE MUCINOUS TUMOR

Fig2.a: Gross specimen showing multiloculated cyst with many solid and cystic areas.

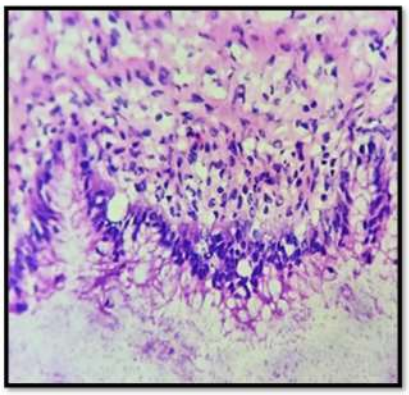

Fig2.b (H&E,40X): Frozen section- Cyst lined by mucin secreting cells with mild to moderate anisonucleosis

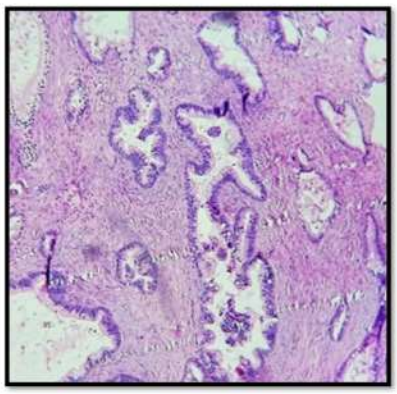

Fig2.c (H&E,10X): Frozen section- Cyst lined by mucin secreting cells with mild to moderate anisonucleosis

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SEROUS CARCINOMA

Fig3.a: Cut surface of gross specimen showing a large, solid, yellowish-red necrotic tissue

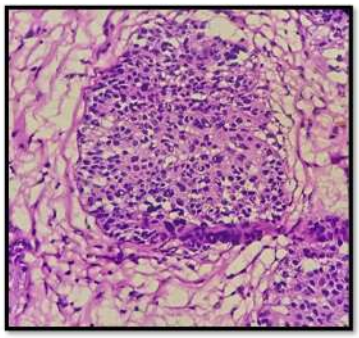

Fig3.b(H&E,40X): Frozen section- Solid sheets of tumor cells with moderate atypia. Mitotic figures are seen.

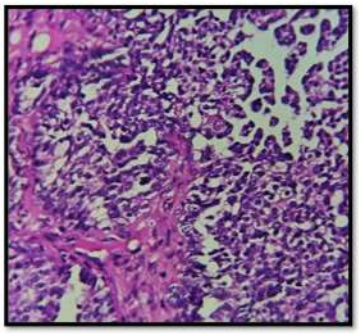

Fig3.c (H&E,40X): Histopathology- Solid sheets of tumor cells with moderate anisonucleosis.

GRANULOSA CELL TUMOR

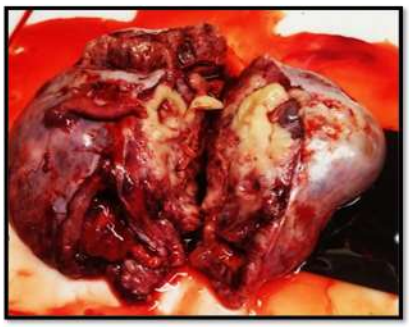

Fig6.a: Gross specimen reveals a multiloculated cyst with solid and cystic areas.

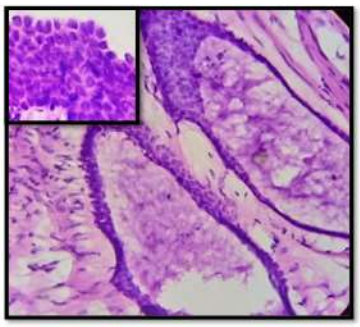

Fig6.b (H&E,40X): Frozen section- Round to oval tumor cells. Inset shows nuclear grooves.

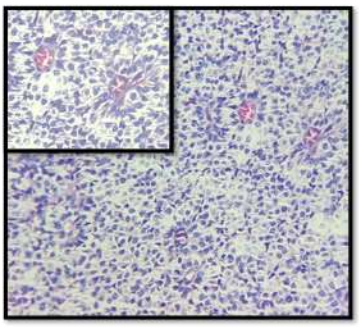

Fig6.c (H&E,40X): Histopathology - Tumor cells arranged in sheets with nuclear grooves. Inset shows Rosette like Call-Exner bodies.

TABLE 3: Comparison between Frozen section and final histopathological diagnosis according to the status of malignancy

	BENIGN	BORDERLINE	MALIGNANT	TOTAL

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Frozen section				
Benign	18	0	0	18
Borderline	0	1	0	1
Malignant	0	0	11	11
Total	18	1	11	30

The sensitivity, specificity, positive predictive value, negative predictive value and accuracy of frozen section in the diagnosis of benign, borderline and malignant tumors were 100%, 100%, 100%, 100% and 100% respectively.

Discussion:

Assessing the characteristics of ovarian tumor during surgery is essential for planning strategic procedures, particularly in young women. This approach can prevent unnecessary removal of the unaffected ovary and support efforts for fertility preservation.

Frozen section analysis was conducted on 30 fresh, unfixed ovarian specimens received in the Department of Pathology.

Relevant information regarding patient was obtained from their case record form and through direct interviews.

The representative pieces of fresh, unfixed tissue were chosen and processed using Cryostat, a medical device employed for quickly freezing pathological sections of human tissue. The specimens were immersed in 10% formalin overnight for fixation, followed by sampling for routine histologic sectioning and processing. The histopathological diagnosis of ovarian tumors, based on the WHO classification, is considered as the gold standard.

In our study, frozen section accurately identified 11 malignant, 1 borderline, and 18 benign ovarian tumors.

The current study included patients ranging from their second to seventh decade of life, with the majority falling in the 40-50 years age group.

Benign tumors were predominantly observed in individuals aged 40-50 years, while malignant tumors were more common in those aged 50-60 years.

Frozen section exhibited 100% sensitivity, specificity, positive predictive value, negative predictive value, and accuracy in diagnosing benign, borderline, and malignant tumors.

Conclusion:

1. Out of the 30 patients included in our study, 11 were diagnosed with malignant tumors, 18 with benign tumors, and 1 with a borderline tumor based on final histopathology.
2. Frozen section accurately identified all benign, borderline, and malignant tumors. (Accuracy =100%).
3. Frozen section demonstrated 100% sensitivity and specificity. The positive predictive value, negative predictive value, and accuracy in diagnosing benign, borderline, and malignant tumors was also 100%.
4. Therefore, we conclude that frozen section is a crucial diagnostic tool for surgeons to determine the extent of surgery and guide subsequent management decisions.

References:

1. Patel AS, Patel JM, Shah KJ. Ovarian tumors-Incidence and histopathological spectrum in tertiary care center, Valsad. IAIM. 2018;5(2):84-93.

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2. Palakkan S, Augestine T, Valsan MK, Vahab KA, Nair LK. Role of frozen section in surgical management of ovarian neoplasm. Gynecology and minimally invasive therapy. 2020 Jan;9(1):13
3. Jena M, Burela S. Role of frozen section in the diagnosis of ovarian masses: an institutional experience. J Med Sci Health. 2017 Jan;3(1):12-8.
4. Phukan A, Borgogoi M, Ghosh S. Histopathological spectrum of ovarian tumors: an institutional perspective. Int. J Res Med Sci. 2018 Aug;6:2639-43.
5. Hashmi AA, Naz S, Edhi MM, Faridi N, Hussain SD, Mumtaz S, Khan M. Accuracy of intraoperative frozen section for the evaluation of ovarian neoplasms: an institutional experience. World journal of surgical oncology. 2016 Dec;14(1):1-5.
6. Arshad NZ, Ng BK, Paiman NA, Mahdy ZA, Noor RM. Intra-operative frozen sections for ovarian tumors–a Tertiary Center Experience. Asian Pacific journal of cancer prevention: APJCP. 2018;19(1):213.
7. Buza N. Frozen section diagnosis of ovarian epithelial tumors: diagnostic pearls and pitfalls. Archives of Pathology & Laboratory Medicine. 2019 Jan;143(1):47-64.
8. Agrawal P, Kulkarni DG, Chakrabarti PR, Chourasia S, Dixit M, Gupta K. Clinicopathological Spectrum of Ovarian Tumors: A 5-Year Experience in a Tertiary Health Care Center. Journal of basic and clinical reproductive sciences. 2015 Jul 21;4(2):90-6.
9. Rajavigneshwari N, Kotasthane DS, Koteeswaran G. Clinicopathological spectrum of ovarian tumours in a tertiary care hospital. J Evol Med Dent Sci. 2017 May 4;6(36):2948-52.
10. Itha MB, Veeragandham S. Study of histopathological spectrum of ovarian neoplasms: An experience at a tertiary care hospital.
11. Dey P. Frozen section: principle and procedure. InBasic and Advanced Laboratory Techniques in Histopathology and Cytology 2018 (pp. 51-55). Springer, Singapore.

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