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Study of Spectrum of Ovarian Lesions in a Tertiary Care Hospital: Comparison between Frozen Section and Histopathological Examination

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Abstract

Background: Ovarian tumours are a heterogeneous neoplasm with a varied clinical, morphological and histological feature. **Materials and Methods:** This prospective study of 1 year comprised of 41 ovarian lesions diagnosed in the Department of Pathology, Grant Medical College and Sir JJ group of hospital. After thorough gross examination, representative bits were processed and stained with H & E. Tumours were classified as per WHO classification. Special stains were done wherever required. **Results:** 41 cases were included in the study, ranging 11-77 years in age, most presented with complaint of pain in abdomen (68.29%). Majority of the primary ovarian lesions were benign (66.67%), followed by malignant (27.78%) and borderline lesions (5.55%). Epithelial tumours were most common (77.78%), followed by germ cell tumours (19.44%) and sex cord stromal tumours (2.78%). Serous cystadenoma was the commonest benign tumour and serous cyst adenocarcinoma was the commonest malignant ovarian tumour. The accuracy of frozen section diagnosis for ovarian lesions was 88.46%. Sensitivity and specificity of frozen section was less for borderline ovarian lesions. **Conclusion:** The prognosis and varying therapeutic strategies of ovarian tumours necessitate an accurate pathological evaluation. Although newer techniques like IHC and molecular analysis have made the diagnosis easier and more precise, in the institutes with provision of limited resources, histopathological study is still the gold standard in diagnosing most of these tumours.

Keywords: Benign lesion, Epithelial tumours, Serous cyst adenoma, Serous cyst adenocarcinoma

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Introduction

Ovarian tumors include complex, wide spectrum of neoplasms involving a variety of histological patterns ranging from epithelial tissues, connective tissues, specialized hormone secreting germinal and embryonal cells ^[1]. The earliest report of the ovarian neoplasms has been reported by Shushruta in his book 'Shushruta and Ayurveda' ^[2]. Ovarian malignancies having an incidence of 5.5 cases per 100,000 and a mortality rate of 3.7 cases per 100,000 are the third most common cause of cancer and cancer related deaths in females in India ⁽³⁻¹⁾. The poor survival is since they do not clinically manifest early and approximately 60-70% of the neoplasms present as either stage III or stage IV ^[1, 3, 4]. Benign ovarian cysts are the commonest, constituting about 80% of ovarian tumors and mostly occur in young women between the ages of 20-40 years. Borderline tumors occur at slightly older ages whereas the malignant tumors are common in older women between the ages of 40-65 years ^[1, 4]. Metastatic

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tumors subsequently involve the ovaries and mimic primary ovarian neoplasia. Approximately 7% of lesions presenting clinically as primary ovarian tumors are of metastatic origin ^[5, 6]. Natural history and response to treatment vary considerably from one group of tumors to others. As there are no confirmatory tests for ovarian tumors and these tumors cannot be confidently distinguished from one another on the basis of their clinical, biochemical. radiological or gross characteristics, it is important to determine the histological pattern of ovarian tumor to achieve the optimum treatment response as prognosis depends on the degree of differentiation ^[3, 7]. Thus present study was undertaken to analyze the frequency of various histological subtypes, age distribution pattern and the diverse histomorphological spectrum of ovarian tumors.

Materials and Methods

This prospective study was conducted for a period of one year in the Department of Pathology, Sir J.J. Group of hospitals and Grant Government Medical College, Mumbai-08. The study included all ovarian specimens received in the department. Specimens received for intraoperative frozen section diagnosis were freshly received and sections were taken using cryostat and stained using rapid H&E stain. The slides were then reviewed microscopically in detail and tumors were classified according to the WHO classification of ovarian tumors.

Results

We included 41 cases in the present study. Majority of the ovarian lesions occurred in the reproductive age group of 31-50 (48.78%). Youngest patient was 18 years of age and oldest patient was 77 years old. The most common clinical presentation observed in our study was pain in abdomen (28 cases; 68.29%) followed by abdominal distention (11 cases; 26.83%). Few cases of menstrual problems (2 cases; 4.88%) like irregular bleeding, menorrhagia, and dysmenorrhoea were also noted in women of reproductive age group. Out of 41 cases, serum CA-125 levels were done for 12 cases of which 4 were malignant, 1 borderline and 8 benign neoplastic cases. The CA-125 levels were raised mainly in serous papillary adenocarcinoma. Among the 41 cases studied, 36 cases were primary ovarian tumors (87.81%), whereas 5 cases (12.19%) were non-neoplastic lesions. The non-neoplastic cases in this study were mainly haemorrhagic corpus luteal cyst, non-specific salpingo-oopheritis and tuberculous salpingo-oopheritis. Among the 36 cases of primary ovarian neoplasms, 24 cases were benign (66.67%), 10 cases were malignant (27.78%) and 2 cases (5.55%) were borderline. Among the primary ovarian neoplasm, epithelial tumors (ET) were the most common histological type (27 cases; 77.78%), followed by Germ cell tumors (GCT) (19.44%) and sex cord stromal tumors (SST) (2.78%). The most common benign tumors were serous cystadenoma (22.22%) followed by mature cystic teratoma (17.07%). Serous cystadenocarcinoma was the most common malignant tumor (14.63%). In our study, 26 cases were received with requisition for intraoperative frozen section diagnosis. We observed that frozen section technique diagnosed 7.69% cases as non-neoplastic, 65.38% cases as benign, 19.24% cases as borderline/ premalignant and 7.69% cases as malignant. However. routine on histopathological processing 11.54% were nonneoplastic, 65.38% cases were benign, 7.69% were borderline and 15.39% were malignant lesions. This observation indicates that some frozen section diagnoses were discordant with the final histopathological diagnosis.

 Table-1: Distribution of cases according to type of lesion and diagnostic procedure

Type of Lesion	Frozen Section Diagnosis		Histopathological Diagnosis		
	No. of Cases	%	No. of Cases	%	
Benign	17	65.38	17	65.38	
Borderline	5	19.24	2	7.6	
Malignanat	2	7.69	4	15.39	
Non- neoplastic	2	7.69	3	11.54	
Total	26	100	26	100	

It was observed that out of 26 cases, 23 cases were concordant while 3 cases were discordant. Hence the overall diagnostic accuracy of frozen section for female genital tract lesions was 88.46%. All the discordant cases were diagnosed as borderline lesions on frozen section diagnosis. However, on final histopathology, 2 cases were reclassified as malignant and 1 case was reclassified as nonneoplastic lesion. The borderline tumors were a major cause of diagnostic discrepancy in this study.

Table-2: Comparison of distribution of study cases based on type of lesion and Diagnostic procedure

Frozen	Histological Diagnosis							
Diagnosis								
	Benign	Borderline	Malignanat	Other	Total			
Benign	17	0	0	0	17			
Borderline	0	2	2	1	5			
Malignanat	0	0	2	0	2			
Non-	0	0	0	2	2			
neoplastic								
Total	17	2	4	3	26			
Total	1/	2	4	3	26			



Figure 1:- Serous Cystadenoma: Cyst with few papillary excrescences on the inner surface Figure 2:- Serous carcinoma: External surface - extensive exophytic papillary growth



Discussion

Ovarian tumors are one of the major health problems and their diagnosis can be difficult due to variety of pathologic conditions affecting the ovaries. Thus, knowledge of morphology and age-specific characteristics can help refine the diagnosis ^[11,12]. In the present study, the patient's age ranged from 18 years to 77 years and this was supported by the study done by GG Swamy et al. ^[18] where the youngest patient was 18 years old and the oldest was 73 years old. Most of the ovarian tumors (60.97%) were seen in the age group of 20-50 years, which was consistent with the study done by Kuladeepa A VK et al. ^[19] (58.9%) and Pilli GS et al. ^[20] (58.3%). In the present study 41 ovarian lesion were studied out of which 36 cases were primary ovarian neoplasm (36 cases; 85.36%). Most of the tumors belonged to the category of epithelial tumors (28; 77.78%) which was comparable to the results seen by Krishna M & Maurya G et al. ^[13] (69.17%), Swati et al ^[14] (77.7%) and Badge S et al. ^[15] (77%). GCT and SST accounted for 19.44 % and 2.78%

respectively in our study compared to 42.2% and 3.1% reported in the literature ^[16]. Present study results are comparable to many other studies, but in contrast with Jha et al which showed relatively a greater number of germ cell tumors.^[14] The incidence of sex cord stromal tumors was relatively less in our study. In the present study, majority of the tumors were benign (66.67%) followed by malignant tumors (27.78%) and rest were borderline (5.55%). Findings of the present study correlated well with the studies of various authors. Commonest benign tumor studied were serous cystadenoma 8 cases followed by mature cystic teratoma 7 cases which is the study of Kanthikar S.N. et al 2014 ^[9] who studied 145 cases out of which most common lesion was serous cystadenoma followed by mature cystic teratoma. The commonest malignant lesion was serous cystadenocarcinoma (8 cases). Literature search shows that the overall accuracy of frozen section in the diagnosis of ovarian tumors range from 86 to 97 % ^[24, 25, 26]. In this study, overall accuracy of frozen section diagnosis was 88.46 %. Geomini et al. did a metanalysis of 18 studies and found that the sensitivity of frozen section in diagnosing ovarian lesions ranged from 65 to 97 % for benign and from 71 to 100% for malignant lesions. They also found specificity ranged from 97 to 100% for benign and from 98.3 to 100 % for malignant tumors ^[16]. In the current study the sensitivity of frozen section diagnosis in diagnosing both benign and malignant lesions was 100 %, however its sensitivity for diagnosing borderline cases was only 40%. The specificity of frozen section diagnosis for benign, borderline and malignant neoplastic cases was 100%, 87.5% and 91.6% Tempfer et al. reviewed three respectively. large studies investigating the accuracy of frozen section examination in diagnosing borderline ovarian tumors and found an overall sensitivity of 80 % ^[27]. The major limitations of frozen section diagnosis are mainly due to restriction of number of sections that can be processed, thick sections and freezing artefacts that obscure the finer details. The diagnostic errors can also be due to sampling error, misinterpretation or suboptimal slide preparation. In the present study the major causes of diagnostic discrepancy were due to heterogeneous nature of the lesions (sampling

low-grade error) and nuclear features (interpretive error). Diagnostic accuracy rate for frozen section analysis is high for benign and malignant ovarian tumors but remain relatively low for borderline ovarian tumors. However, despite its limitations frozen sections continues to be an essential tool for rapid intraoperative diagnosis of ovarian neoplasm and helps a surgeon plan further surgical management accordingly. Regular re-evaluation regarding the disagreement between frozen section diagnosis and final paraffin section diagnosis should be conducted as a part of quality assurance.

Conclusion

The prognosis and varying therapeutic strategies of ovarian tumours necessitate an accurate pathological evaluation. Although newer techniques like IHC and molecular analysis have made the diagnosis easier and more precise, in the institutes with provision of limited resources, histopathological study is still the gold standard in diagnosing most of these tumours. We conclude that benign ovarian neoplasms are the most common lesions of ovary. Intraoperative frozen section diagnosis was observed to have high sensitivity for both benign and malignant lesions but was low in case of borderline lesions. However, it is a very useful diagnostic tool in classifying and staging ovarian neoplasms and provide useful insight to the surgeon in planning further management.

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