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Benign, malignant, and borderline surface ovarian epithelial tumors: A prospective analysis

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Abstract
Introduction: Ovarian cancer accounts for 3% of all cancers in females. About 80% of these are benign, and they occur mostly in young women between 20 and 45 years. Borderline tumors occur at slightly older ages while incidence of malignant tumors increases with age, occurring predominantly in perimenopausal and postmenopausal women. About 190,000 new cases and 114,000 deaths from ovarian cancer are estimated to occur annually worldwide. The aim of the study was to evaliuate the spectrum of surface ovarian tumor in a tertiary referral centre.
Material and methods: This was a hospital based cross sectional observational study conducted for one year from 1st June 2019 to 31st May 2020 in the Department of Pathology, Indira Gandhi Medical College, Shimla.
Results: On histological examination, majority of epithelial ovarian tumors were benign 38 (50%) followed by malignant 32 (42.1%) and borderline tumors 6 (7.9%). Serous (47.4%) and mucinous cystadenomas (44.7%) constituted the predominant group among benign tumors followed by Brenner tumors (7.9%). Borderline tumors comprised of 4 atypical proliferative mucinous tumors (APMT) and 2 atypical proliferative serous tumors (APST). Malignant tumors comprised 32 out of total 76 cases. Amongst them Serous carcinoma constituted 71.9% of total cases followed by 12.5% endometroid carcinomas, 9.4% mucinous carcinomas and 1 case each of malignant Brenner tumor and clear cell carcinoma.
Conclusion: In our study, in both benign and malignant cases, serous tumor was the commonest followed by mucinous tumors.

Keywords: ovarian tumors, benign, malignant, clinical profile

Introduction
In developed countries, ovarian cancer is a commonly occurring neoplasm, ranking the 7th and 6th most frequent position for incidence and mortality, respectively [1]. High-incidence areas are Europe and North America, making it an important public health issue [2].
Epithelial ovarian tumors are thought to arise from the surface epithelium (mesothelium) of the ovary [3]. Most early-stage ovarian cancer produces no symptoms, and therefore the majority of the patients present with advanced disease, making prognosis poor. So far, pathologists have devoted very little attention to early ovarian cancer originating in a coexisting benign epithelial lesion [4]. The precise origin of this epithelium is controversial; one hypothesis argues that the mesothelium lining of the ovarian surface undergoes a Müllerian metaplasia; another one that the same epithelium is derived from the fallopian tube or uterus via passive transport [5]. Majority of the ovarian cancers are epithelial cancers.
The ovarian surface epithelium (OSE) is generally regarded as the precursor of epithelial ovarian tumors. Recent evidence, however, suggests that the fallopian tube could also be the source of some subtypes of epithelial ovarian cancers.
The present study was undertaken to analyze the benign, malignant, and borderline surface ovarian epithelial tumors.

Methods
This was a hospital based cross sectional observational study conducted for one year from 1st June 2019 to 31st May 2020 in the Department of Pathology, Indira Gandhi Medical College, Shimla. All the surface epithelial ovarian tumor specimens with definite histopathological diagnosis, irrespective of age were considered for study. Ovarian tumors other than surface epithelial ovarian tumors, metastatic tumors from non-ovarian primary, patients with SEOTs on/prior radiation or chemotherapy and patients with recurrence of SEOTs were excluded from the study.

Results
Tumor type
On histological examination, majority of epithelial ovarian tumors were benign 38 (50%) followed by malignant 32 (42.1%) and borderline tumors 6 (7.9%).

Distribution of benign tumors
As shown above in Figure 1, serous (47.4%) and mucinous cystadenomas (44.7%) constituted the predominant group among benign tumors followed by Brenner tumors (7.9%).

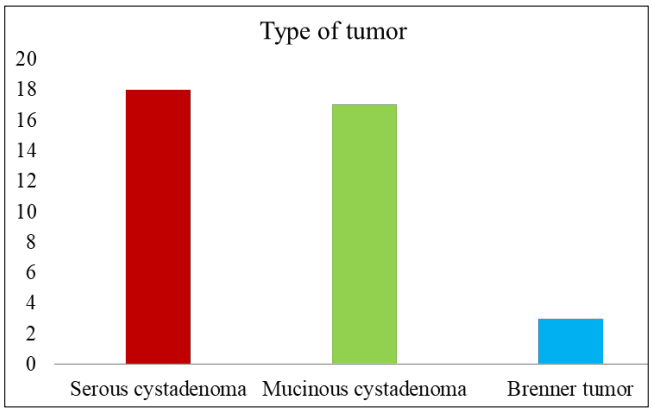

Fig 1: Distribution of benign tumors

Distribution of borderline tumors

Borderline SEOTs are uncommon epithelial ovarian neoplasms having morphology and behavior intermediate between benign and malignant tumors. Borderline tumors comprised of 4 atypical proliferative mucinous tumors (APMT) and 2 atypical proliferative serous tumors (APST) (Figure 2).

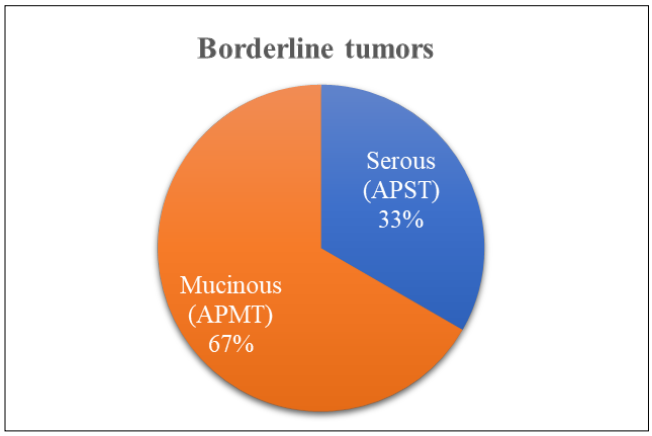

Fig 2

Distribution of malignant tumors

Malignant tumors comprised 32 out of total 76 cases. Amongst them Serous carcinoma constituted 71.9% of total cases followed by 12.5% endometroid carcinomas, 9.4% mucinous carcinomas and 1 case each of malignant Brenner tumor and clear cell carcinoma (Figure 3).

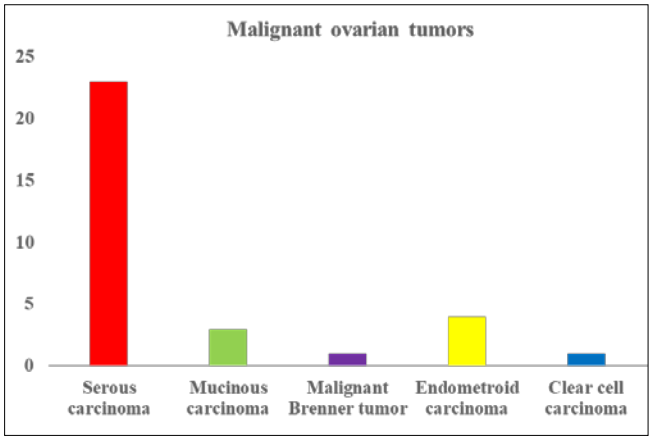

Fig 3: Distribution of malignant tumors

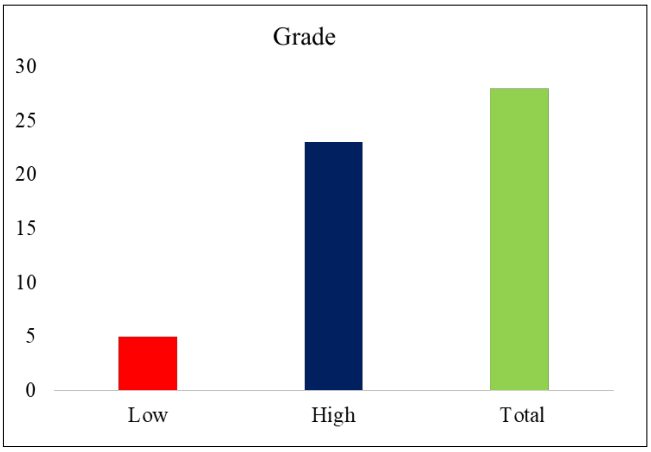

Fig 4: Grading of malignant tumors

Grading of malignant tumors

Twenty-eight out of total 32 malignant cases were graded according to "two tier grading system" as low- and high-grade tumors (Figure 4). Among graded malignant tumors 23 (82.1%) were high grade while 5 (17.9%) were low grade tumors. Rest 4 tumors comprised of mucinous carcinomas (3 cases) and malignant Brenner tumor (1 case). They were not assigned any grade.

Discussion

Predominant surface epithelial tumors encountered in the present study were serous tumors (55.3%) followed by mucinous tumors (31.6%) consistent with the findings of Sylvia *et al* [6]. Endometroid tumors constituted the next category in all the studies in concordance with the present study.

Other tumors including transitional cell tumors and clear cell tumor were relatively less in number and correlated well to the studies conducted by Sylvia *et al* [6] However, Gursan N. *et al*. (2009) didn't encounter transitional, clear cell and seromucinous tumors in their study subjects [7]. These variations could be due the heterogeneous sample size and age in various studies.

Grading of SEOTs is mainly done for serous carcinomas and endometroid carcinomas. In mucinous carcinomas the presence of invasion and its pattern seem to be more important than grading for the prognosis. WHO recommends to grade transitional tumors according to the criteria used for transitional cell carcinoma of the urinary tract. However, most of them are reported as high-grade tumors. Clear cell carcinoma and undifferentiated carcinoma are also high-grade tumors and grading is not assigned to them [8].

Conclusion

The strength of this study is the analysis specified to the various histological subtypes of ovarian cancer and malignancies. Our findings may prompt to not only reporting ovary cancer but also coexisting ovarian tumor conditions.

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