








# Analysis of Adnexal Masses Which are Operated in Gynecologic Oncology Clinic

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## Abstract

**Objective:** Abnormal adnexal masses are a common gynecologic problem that affects women of all ages. Although many of these masses are benign, the primary aim of diagnostic evaluation is to exclude malignancy. In this trial, we aimed to analyze adnexal masses that are referred and operated in our gynecologic oncology clinic.

**Methods:** A total of 1,152 patients operated in our clinic due to suspicious malignancy between 2004 and 2017 were included in this trial. Patient data from the database of the gynecologic oncology clinic were analyzed retrospectively.

**Results:** Among all included patients, benign pathological results were determined in 529 (45.92%) patients, whereas malignant and borderline tumors were determined in 505 (43.83%) patients and 118 (10.24%) patients, respectively. The median cancer antigen 125 level in the malignancy group was 150 (7-15,554) IU/mL, whereas that in the benign and borderline groups, it was 19 and 29 IU/mL, respectively.

**Conclusion:** Many benign masses imitate ovarian cancer. Although some of them can be separated, pre-operative careful examination and histological examination are the established diagnostic procedures.

**Keywords:** Carcinoma, ovarian neoplasms, pathology

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## INTRODUCTION

The presence of abnormal adnexal mass is a common clinical problem that can affect women of all ages. Although most of the adnexal masses are benign, the primary objective in the diagnostic evaluation is the exclusion of malignancy. Currently, there is no effective screening method for ovarian cancer (1). Ovarian cancer is the second most common gynecological cancer in the world and is the main cause of death due to gynecologic malignancy in women. The lifetime risk of epithelial ovarian cancer, which constitutes the majority of ovarian cancers, is 1.3%, and 70% of the patients are diagnosed in an advanced stage (2).

Ovarian masses may be functional or neoplastic, and neoplastic tumors may be benign or malignant. Most (80%-85%) of the ovarian tumors are benign, and two-thirds are seen in women aged between 20 and 44 years (3). Adnexal masses are evaluated through history, physical examination, laboratory tests, and imaging methods preoperatively (4).

In this study, we aimed to analyze the adnexal masses that were referred to the gynecologic oncology clinic of our hospital because of malignancy suspicion.

## METHODS

This retrospective study was conducted in accordance with the 2008 Declaration of Helsinki principles. We routinely request consent from patients we are going to operate on at our clinic, therefore

**Table 1.** General characteristics of patients with adnexal mass

	n (%) 1152	Age (mean) mean±SD 46.23	Parity (mean) mean±SD 2.76	Ca 125 (median) U/mL 77.45	Largest tumor diameter cm (median) 9.0	Postmenopausal status
Benign	529 (45.92)	43.25±14.8	2.74±2.48	19 (2-2697)	8 (2-42)	%32
Borderline	118 (10.24)	42.38±13.9	2.40±2.33	29 (2-15346)	10 (4-48)	%27
Malignant	505 (43.83)	50.27±12.17	2.89±2.28	150 (7-15554)	10 (2-50)	%59

**Table 2.** The distribution of benign adnexal masses

Histopathology	n (%)
Mucinous cystadenoma	123 (23.25)
Serous cystadenoma	90 (17.01)
Fibroma	32 (6.04)
Fibrothecoma	70 (13.23)
Dermoid cyst	98 (18.52)
Struma ovarii	2 (0.37)
Endometrioma	97 (18.33)
Pelvic abscess	11 (2.07)
Benign brenner	6 (1.13)
Total	529 (100)

**Table 3.** Distribution of borderline tumors

Histopathology	n (%)
Serous borderline tumors	50 (42.37)
Mucous borderline tumors	68 (57.62)
Total	118 (100)

written informed consent was obtained from each participant. Ethical approval was not obtained because of the retrospective nature of the study between 2004 and 2017, a total of 1,152 patients with adnexal masses who were operated for the suspicion of malignancy in our gynecological oncology clinic were included in the study. The patients who were operated in an external center with the consideration that they had benign adnexal masses, whose pathology result was malignant, and who were referred to us for complementary surgery were excluded from the study. The patients were analyzed retrospectively from the database of the gynecologic oncology clinic. Demographic characteristics of the patients and pathological features of the masses were recorded.

### Statistical Analysis

Statistical Package for Social Sciences, version 22.0 (IBM SPSS Corp.; Armonk, NY, USA) program was used for the statistical analysis.

## RESULTS

A total of 254 patients underwent laparoscopy, and 898 patients underwent laparotomy. Out of 529 adnexal masses, benign pathology was observed in 529 (45.92%) patients, malignant pathology in 505 (43.83%) patients, and borderline pathology in 118 (10.24%) patients. While the mean age of the patients with malignant pathology was 50.27±12.17, the mean age of the patients with borderline pathology was 42.38±13.9. While the median cancer antigen (CA) 125 level was observed as 150 U/mL (7-15,554) in the patients with malignant adnexal mass, it was found as 19 IU/mL in the benign group and as 29 IU/mL in the borderline group. Of the patients with malignant adnexal mass, 59% were in the postmenopausal period. It was found that 27% of borderline patients and 32% of benign patients were in the postmenopausal period (Table 1). While the accuracy rate between frozen and final pathology in malignant adnexal masses was 85%, it was 80% in the borderline group. In the benign group, the accuracy rate between frozen and final pathology was higher than the other two groups (95%).

The results of the final pathology in the benign group showed that 123 patients (23.25%) had mucinous cystadenoma, 90 patients (17.01%) had serous cystadenoma, 32 patients (6.04%) had fibroma, 70 patients (13.23%) had fibrothecoma, 98 patients (18.52%) had dermoid cyst, and 97 patients (18.33%) had endometrioma (Table 2).

In the borderline group, 50 patients (42.37%) had serous borderline tumors, and 68 patients (57.62%) had mucinous borderline tumors (Table 3).

The results of the pathological examination in the malignancy group showed that 417 patients (82.57%) had epithelial ovarian tumor, 38 patients (7.52%) had sex cord stromal tumor, 10 patients (1.98%) had germ cell tumors, 14 patients (2.77%) had metastatic ovarian tumor, and 20 patients (3.96%) had tubal adenocarcinoma.

## DISCUSSION

Ovarian and tubal cancers are the gynecologic cancers with highest mortality rates in developed countries (5). In their study conducted on 4,848 patients with adnexal mass, Dirk et al. reported that the rate of malignancy in oncology centers was 43% and that the rate of malignancy in other centers was 17% (48). In our study, we found the rate of malignancy as 43.83% and the rate of borderline tumor as 10.24%. Of ovarian cancers, 80%-85% have epithelial origin. High-grade serous tumors are the most common histological type (5). In our study, we most commonly (46.33%) found the histology of serous epithelial

Table 4. Distribution of malignant adnexal tumors

Histopathology	n (%)
Epithelial ovarian tumors	417 (82.57)
Serous cystadenocarcinoma	234 (46.33)
Mucinous cystadenocarcinoma	94 (18.61)
Endometrioid cystadenocarcinoma	42 (8.31)
Clear cell carcinoma	23 (4.55)
Poorly differentiated tumors	14 (2.77)
Squamous cell carcinoma	2 (0.39)
Mixed epithelial ovarian tumor	8 (1.58)
Sex cord stromal tumors	38 (7.52)
Granulosa cell tumor	36 (7.12)
Sertoli-Leydig	2 (0.39)
Germ cell ovarian tumors	10 (1.98)
Dysgerminoma	4 (0.79)
Immature teratoma	4 (0.79)
Endodermal sinus tumor	1 (0.19)
Carcinoid tumor	1 (0.19)
Others	6 (1.18)
Malignant mixed mesodermal sarcoma	6 (1.18)
Metastatic ovarian tumors	14 (2.77)
Tubal adenocarcinoma	20 (3.96)
Total	505 (100)

ovarian adenocarcinoma in the malignant group, which is consistent with the literature.

Sex cord stromal ovarian tumors account for approximately 7% of malignant ovarian tumors, and the most common malignant tumors in this group are granulosa cell tumors (7). We found that the rate of granulosa cell tumors in the malignant adnexal group was 7.12%. Malignant germ cell tumors account for up to 5% of all malignant ovarian neoplasms, and the majority are seen in the first two decades (8). Because of the small number of patients less than 18 years of age admitted to our clinic, we detected malignant germ cell tumors only in 10 (1.98%) patients. Most commonly, we detected dysgerminoma and immature teratoma. Of the ovarian tumors, 5%–6% are frequently caused by metastases from other organs such as other genital organs, gastrointestinal tract, or breast (9). In this study, we found the rate of metastatic ovarian tumors as 2.77%. Nowadays, it is accepted that the most common high-grade serous carcinoma is caused mainly by fimbria and tuba uterine, and it is accepted that there are tuba uterine and peritoneal cancers at the etiology (10). In our study, the rate of primary tubal adenocarcinoma was found to be 3.96%. Borderline

tumors constitute up to 10%-15% of epithelial ovarian tumors (11). In our study, we found the rate of borderline tumor as 10.24%.

The shape, boundaries, and diameter of the ovary mass, whether it is cystic or solid, single or bilateral, and the features such as the presence of acid should be determined through ultrasonography (USG). Tumor markers, especially human chorionic gonadotropin, alpha fetoprotein, and CA-125, are important in the differential diagnosis. However, the definitive diagnosis in the ovarian masses is made by histopathological examination of the operation material (12). In the results of USG, physical examination, and tumor markers, cystadenoma, fibroma, fibrotekom, dermoid cyst, and endometrioma were found to be the major benign masses mimicking malignancy in our study. We found that squamous cell carcinoma developed on the basis of dermoid cyst only in two patients, and carcinoid tumor developed in one patient. Although there may be malignant changes in endometriosis, it can sometimes be found together with ovarian tumors without malignant changes; ovarian cancers, which are most commonly accompanied by endometriosis, are clear cell and endometrioid type cancers (13). In our study, we found three endometrioid adenocarcinomas and three clear cell carcinomas.

## CONCLUSION

Many benign masses can mimic ovarian cancer, and some of these masses can be differentiated from malignancy with careful preoperative examination, but definitive diagnosis is made by histopathological examination.

**Ethics Committee Approval:** Authors declared that the research was conducted according to the principles of the World Medical Association Declaration of Helsinki "Ethical Principles for Medical Research Involving Human Subjects", (amended in October 2013).

**Informed Consent:** Written informed consent was obtained from the patients who participated in this study.

**Peer-review:** Externally peer-reviewed.

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