International Journal of Clinical and Diagnostic Pathology

ISSN (P): 2617-7226
ISSN (E): 2617-7234
www.patholjournal.com
2024; 7(4): 49-54
Received: 02-09-2024
Accepted: 09-10-2024

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Histomorphological pattern of ovarian tumor in a Tertiary Level Hospital, Dhaka, Bangladesh

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DOI: https://doi.org/10.33545/pathol.2024.v7.i4a.2032

Abstract
Background: Ovarian tumors are one of the common malignancies of female all over the world affecting all age groups. It has become increasingly important because of the large variety of neoplastic entity.
Objectives: To sort out the histomorphological pattern of ovarian tumors in a group of population of Bangladesh.
Methods: It was carried out at the Department of Pathology, Dhaka Medical College Hospital, Dhaka, Bangladesh between July 2017 to Dec 2017 which included 100 cases. They were clinically and sonographically diagnosed ovarian tumor patients. Samples of these patients were received at the pathology department.
Results: In this study, majority (28.0%) patients belonged to age 31-40 years. The mean age was found 36.3±12.7 years. Most of the patents had abdominal discomfort and occasional pain (63.0%). Most of the patients had unilateral lump (89.0%). Majority (56.0%) patients had cystic tumor and omental deposit was found in six (6.0%) cases. Majority (69.0%) were benign tumors, one (1.0%) was borderline and 30 (30.0%) were malignant tumors. Surface epithelial tumors were most common (65.0%), followed by germ cell tumors (32.0%), sex cord-stromal tumors (2.0%) and metastatic tumor (1.0%).
Conclusion: From the clinical behavior, it is not possible to distinguish certainly benign ovarian tumor from its malignant counterpart. The different therapeutic management of ovarian tumors necessitate accurate pathological evaluation. Histopathological study is still the gold standard in diagnosing most of the tumors.

Keywords: Ovarian malignancy, common malignancies, histomorphology

Introduction
Ovarian cancer is the most lethal gynaecological cancer. Worldwide, 2,39,000 new cases of ovarian cancer and estimated deaths of 1,52,000 are recorded in 2014. [1] It is the fourth most common cancer in women in India [2, 3]. In Bangladesh, ovarian cancer is in the 12th position in newly diagnosed cancer cases. Prevalence rate in Bangladesh is about 4.4/ 100,000 [4]. The National Institute of Cancer Research and Hospital (NICRH) cancer registry data revealed that about 20-25% cancers are diagnosed in a localized stage [5]. In the developed countries, more than 90% of ovarian cancers are epithelial in origin, the remaining constitutedby germ cell tumours (2–3%) and sex cord-stromal tumours (5–6%). Germ cell tumours account for 10–15%of ovarian cancers in Asian and African populations. Dysgerminoma accounts for more than 70% of germ cell tumours, whereas granulosa cell tumours constitute the most common sex cord-stromal tumour. The vast majority of epithelial ovarian cancers are diagnosed in postmenopausal women, whereas germ cell tumours occur in young women of child-bearing potential, who are often in their twenties. [6] Ovarian tumor requires immediate diagnosis and management. Early diagnosis may make a huge difference in treatment modality and even outcome. Histopathological examination plays an important role for definitive diagnosis and patient management. Information on the existing disease pattern and health seeking behavior is essential to provide health care delivery to any population. The aim of this study is to identify the histopathological pattern of ovarian tumor and association of clinical parameters, gross morphology and risk factors among these patients.

Materials and Methods

It was an observational cross-sectional study carried out at Department of Pathology, Dhaka Medical College Hospital, Dhaka, Bangladesh from July 2017 to December 2017 which included clinically and sonographically diagnosed ovarian tumor sample of the patient received at the department. Sample size was determined as 100 cases and sampling done with purposive sampling method. Inclusion criteria was resected ovarian mass from all age group and exclusion criteria were a) non neoplastic cyst of ovary and b) patient who is unwilling to participate.

Ethical assurance for protection of human rights

Keeping compliance with Helsinki Declaration for Medical Research involving human subjects 1964, participation in this study was absolutely volunteered. Consent was obtained after explanation about the study in Bengali to all respondents.

Results

Majority patients (28.0%) belonged to age 31-40 years. The mean age was found 36.3±12.7 years. Among them, only 3.0% patient had family history of ovarian tumor. Majority (64%) patients did not use contraceptive, 13(13%) patients took injectable contraceptive, 10(10%) used oral contraceptive pill (OCP), 8(8%) used barrier, 3(3%) used tubal ligation and 2(2%) used IUCD.

Table 1: Distribution of the study patients by symptoms of ovarian tumour (n=100)

Symptoms of tumour	Number of patients	Percentage
Abdominal lump	47	47.0
Abdominal heaviness	31	31.0
Abdominal discomfort and Occasiomal pain	63	63.0
Severe abdominal pain	9	9.0
Abnornal vaginal bleeding	11	11.0
Urinary symptom	21	21.0
Loss of appetite,dyspepsia	41	41.0
Loss of body weight	53	53.0
Shortness of breath	17	17.0
Back pain	46	46.0
Incidental diagnosis	9	9.0

Most of the patients had unilateral lump (89.0%). In relation to sonographic findings, 56 (56.0%) patients had cystic tumors. Rest of them (44%) were solid or partly solid/cystic in consistency. Ascites was found in 19 (19.0%) patients in USG.

Figure-1 shows majority 69 (69.0%) were benign tumors, 1(1.0%) were borderline and 30(30.0%) were malignant tumors.

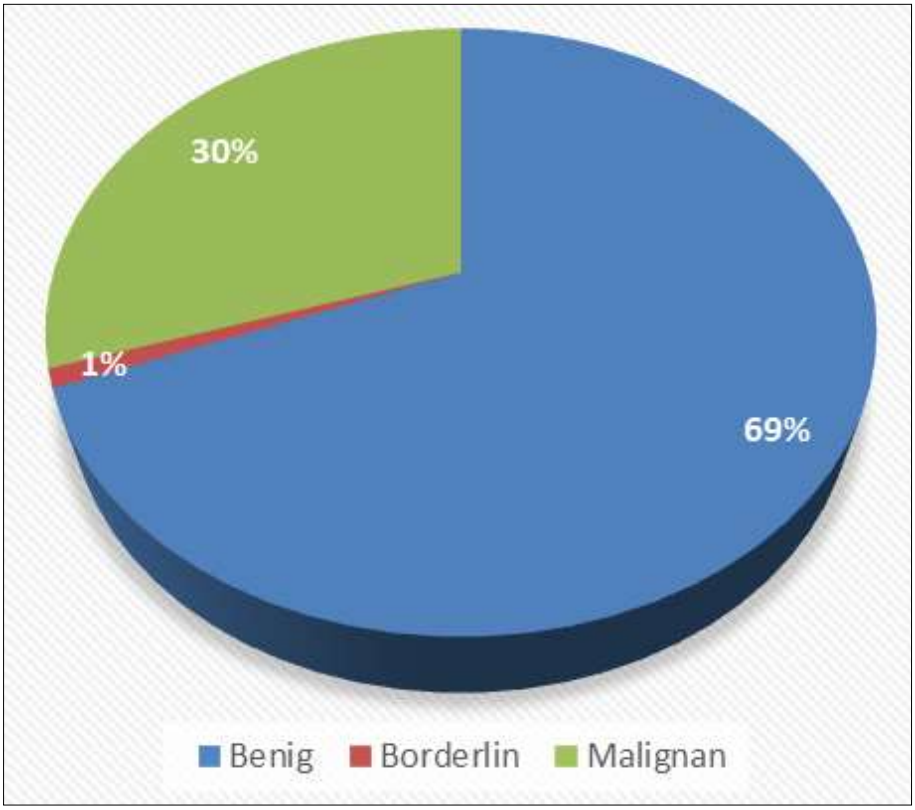

Fig 1: Distribution of the study patients by type of ovarian tumor (n=100)

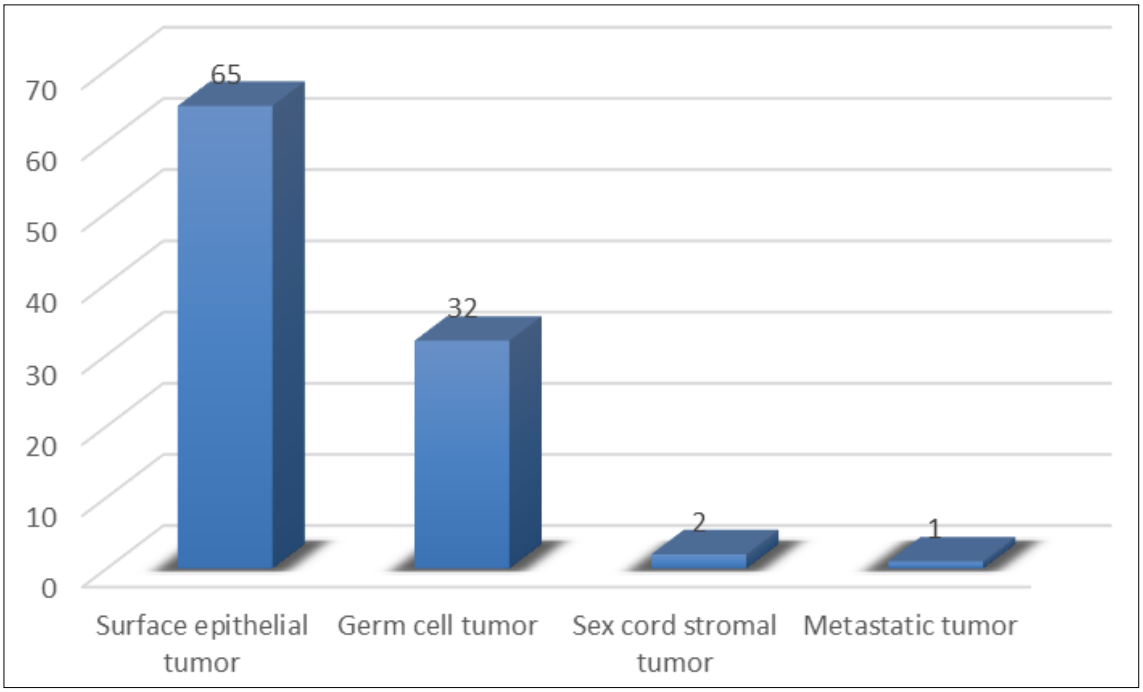

Fig 2: Histomorphological pattern of ovarian tumor (n=100)

Figure-2 shows majority 65 (65.0%) were Surface epithelial tumors followed by Germ cell tumor 32(32.0%) tumors.

Table 2: Distribution of the study patients by macroscopic findings of ovarian tumors (n=100)

Macroscopic findings	Number of patients	Percentage
Size of tumor		
<10 cm	39	39.0
10-20 cm	53	53.0
>20 cm	8	8.0
Capsule		
Intact	81	81.0
Ruptured	19	19.0
Cosistancy		
Cystic	56	56.0
Solid	13	13.0
Cystic and solid	31	31.0
Cut section		
Unilocular	59	59.0
Multilocular	41	41.0
Content		
Thin serous fluid	36	36.0
Thick mucoid fluid	15	15.0
Sebaceous material/hair	26	26.0
Haemorrhage/necrosis	14	14.0
Omental deposit	6	6.0

Table 2 shows that most of the patients (53.0%) had size of tumor within the range of 10-20 cm, most of the tumors had intact capsule (81.0%). Most of the patients had cystic tumor (56.0%), unilocular cyst was (59.0%). Most of the cystic tumors contained thin serous fluid (36.0%). A total of 100 cases of ovarian tumors were documented in this study period, out of which majority 69(69.0%) were benign tumors, 1(1.0%) were borderline and 30(30.0%) were malignant tumors. In this study, surface epithelial tumors were most common 65(65.0%) followed by germ cell tumors 32(32.0%), sex cord-stromal tumors 02(2.0%) and metastatic tumor 01(1.0%). Among the surface epithelial tumours, the pattern of distribution are as follows:

Table 3: Percentage distribution of surface epithelial tumors (n=65)

Type of surface epithelial tumors	Number of patients	Percentage
Serous cystadenomas	26	40.00
Serous cysadenofibroma	02	3.08
Mucinous cystadenomas	09	13.85
Mucinous cysadenofibroma	03	4.62
Brenner tumor	01	1.54
Serous cystadenocarcinoma	15	23.08
Mucinous cystadenocarcinomas	06	9.23
Endometrioid carcinoma	01	1.54
Microinvasive Mucinous carcinoma	01	1.54
Mucinous borderline tumor	01	1.54

Table 3 shows out of 65 cases of surface epithelial tumors, serous cystadenomas comprised about 26 cases (40.0%), serous cystadenocarcinoma 15 cases (23.08%), mucinous cystadenomas about 9 cases (13.85%) and mucinous cystadenocarcinomas 6 cases (9.23%).

On the other hand, germ cell tumours show the following distribution according to subtypes:

Table 4: Distribution of germ cell tumors

Type of Germ cell tumors	Number of patients	Percentage
Mature cystic teratoma	22	68.75
Mature cystic teratoma with serous cyst adenoma	01	3.13
Mature cystic teratoma with mucinous cyst adenoma	03	9.38
Immature teratoma	01	3.13
Dysgerminoma	04	12.50
Yolk sac tumor	01	3.13

Table 5: Distribution of histomorphological pattern of ovarian tumors according to consistency (n=100)

Histomorphological pattern	Consistency		
	Cystic (n=56)	Solid (n=13)	Cystic and solid (n=31)
	n(%)	n(%)	n(%)
Surface epithelial tumors	44(78.6)	7(53.8)	14(45.2)
Germ cell tumors	12(21.4)	4(30.8)	16(51.6)
Sex cord-stromal tumors	-	2(15.4)	-
Metastases	-	-	1(3.2)

Table 5 shows 56 were cystic in consistency, out of which 44(78.6%) were surface epithelial tumors, 13 were solid consistency out of which 7(53.8%) were surface epithelial tumors and 31 were cystic and solid consistency out of which 16(51.6%) were germ cell tumors.

Table 6: Distribution of histomorphological pattern in type of tumor (n=100)

Histomorphological pattern	Type of tumor		
	Benign (n=69)	Borderline (n=1)	Malignant (n=30)
	n(%)	n(%)	n(%)
Surface epithelial tumors	41(59.4)	1(100.0)	23(76.7)
Germ cell tumors	26(37.7)	0(0.0)	6(20.0)
Sex cord-stromal tumors	2(2.9)	0(0.0)	0(0.0)
Metastases	0(0.0)	0(0.0)	1(3.3)

From this study, with relation to grading, it was observed that 4 patients were low grade and 11 were high grade of serous cystadenocarcinoma. Four patients were low grade and 2 were high grade of mucinous cystadenocarcinomas.
Omental deposit of malignant tumours in serous cystadenocarcinoma was found in 3(10.0%), mucinous cystadenocarcinomas 2(6.7%) and endometrioid carcinoma 1(3.3%).

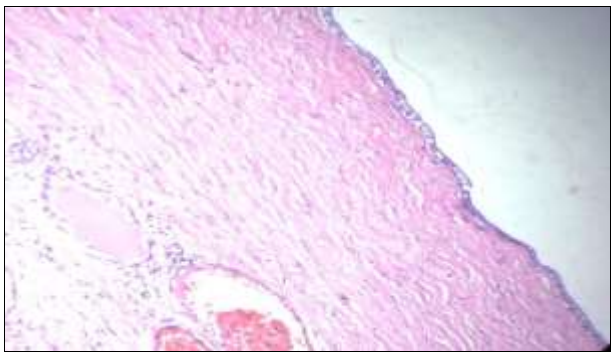

Fig 3: Photograph showing serous cystadenoma lined by single layer of columner epithelium

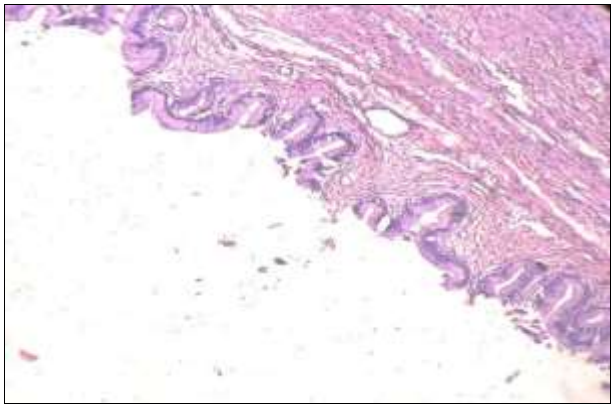

Fig 4: Photograph showing mucinous cystadenoma lined by columner epithelial cells with apical mucin

Fig 5: Gross picture of papillary serous cystadenocarcinoma

Fig 6: Gross picture of papillary serous cystadenocarcinoma. Cut surface reveals solid growth with papillary excrescences.

Fig 7: Gross picture of mucinous cystadenocarcinoma. Cut surface reveals multilocular cyst with solid areas

Fig 8: Gross picture of mature cystic teratoma. Cut surface shows unilocular cyst with sebaceous material and hair shafts

Discussion

Incidence

A total of 100 cases of ovarian tumors were documented in this study period, out of which majority (69.0%) were benign tumors, 1(1.0%) was borderline and 30(30.0%) were malignant tumors. Quite similar results were seen in studies conducted by Kanya [7] and Sawant and Mahajan [8]. Kanya [7] observed that out of 154 ovarian tumors, 75.3% (116/154) were benign, 3.2% (5/154) borderline, 21.4% (33/154) were malignant. Study of Sawant and Mahajan [8] reported that among the 70 neoplastic ovarian lesions, 52 (75.7%) cases were benign, 2(6.1%) cases were at borderline and 6 (18.2%) cases were malignant.

Age distribution

In this study, age range was from 9-80 years and 28(28.0%) patients belonged to age 31-40 years which constituted the major portion. The mean age was found 36.3±12.7 years. The youngest patient of our series was a girl of 9 years with dysgerminoma and the oldest patient was 80 years old woman with mucinous cystadenocarcinoma ovary.

Nature of the tumors

This study revealed that surface epithelial tumors were most common (65, 65.0%) followed by germ cell tumors (32, 32.0%), sex cord-stromal tumors (02, 2.0%) and metastatic tumor (01, 1.0%). Similar result was observed in many other studies. Thakkar and Shah [9] observed that amongst all types, the serous tumors formed the largest group (65.4%) followed by germ cell tumors (17.8%) which was followed by mucinous tumors which accounted to 8.5% of the total found in the study. Sex cord stromal tumor constituted for about 6.1%. In the present study, out of 32 cases of germ cell tumors, mature cystic teratoma was 22(68.75%), dysgerminoma 4(12.50%), mature cystic teratoma with mucinous cyst adenoma 3(9.38%).

Clinical presentation

It was observed that most of the patients had abdominal discomfort and occasional pain (63.0%) followed by loss of body weight (53.0%), abdominal lump (47.0%), back pain (46.0%), loss of appetite and dyspepsia (41.0%) and abnormal vaginal bleeding (11%). Present study concorded well with studies by Pilli *et al.* [10] where pain in abdomen was the commonest symptom. Thakkar and Shah [9] revealed that abdominal pain was the single most common presenting symptom followed by menorrhagia. In non-neoplastic lesions menorrhagia was the commonest symptom.

In the present study, it was found that serum CA 125 was found raised in 13 cases of serous cystadenocarcinoma and 3 cases of mucinous cystadenocarcinoma. Serum CA 19.9 was found raised in 5 cases of serous cystadenocarcinoma and 4 cases of mucinous cystadenocarcinoma. Serum alfa fetoprotein was found raised in immature teratoma and yolk sac tumor. Engelenet *et al* [11] showed in patients with mucinous tumors preoperative CA 19-9 was more frequently elevated (8/14, 57%) than CA 125 (3/20, 15%) or CEA (2/18, 11%).

Site of involvement

Most of the patients had unilateral lump (89.0%). Majority (56.0%) patients had cystic tumor. Ascites was found in 19(19.0%) and metastasis to pelvic lymph nodes was 5(5.0%).

Histomorphological features

In this study, most of the patients had tumor size of 10-20 cm (53.0%). Intact capsule was 81(81.0%), most of the patients had cystic tumor (56.0%), unilocular was 59(59.0%), thin serous fluid was 36(36.0%) and omental deposit found in 6 (6%) cases. Omental deposit of malignant tumours was found in4serous cystadenocarcinomas (13.0%) and 2mucinous cystadenocarcinomas (6.7%) patients. Kanya [7] observed that on gross examination majority were cystic 55.1% (85/154), 24.6% (38/154) were solid. 20.21% (31/154) showed both solid and cystic areas. In Panchal *et al* [12] study, majority of the tumors were cystic 37(44.5%) followed by solid 11(13.2%) and mixed 35(42%). Sawant and Mahajan [8] study showed on gross examination 44.78% cases were cystic, 22.39% were solid and 32.83% cases were partly solid and partly cystic. Pradhan *et al.* [13] observed that gross examination of the specimens revealed that majority of the tumors were cystic (44.5%) followed by solid (13.2%) and mixed (42%).

In this study, 56 cases were cystic in consistency, out of which 44(78.6%) were surface epithelial tumors, 13 were solid in consistency out of which 7(53.8%) were surface epithelial tumors and 31 were cystic and solid in consistency out of which 16(51.6%) were gram cell tumors. In study of Garg *et al.* [14] it was observed that out of the total 60 Epithelial tumours, 50 were cystic in nature (83.3%), followed by those with cystic to solid in consistency (9; 15%) and solid (1; 1.7%), whereas most of Germ cell tumours were cystic in nature (12; 75%), followed by solid in consistency (3; 18.8%). Majority of Sex cord stromal tumours (4; 57.1%) and all of the metastatic tumours were partly solid to cystic in consistency.

In this study, out of 69 benign tumors, most were surface epithelial tumours (41,59.4%), followed by mature cystic teratoma (26;37.7%), sex cord stromal tumor (2;2.9%). One patient had borderline surface epithelial tumors. Malignant tumors were found in 30 patients, out of which 23(76.7%) were surface epithelial tumours followed by dysgerminoma (4; 13.3%). Garg *et al.* [14] observed that the most common benign tumour was serous cystadenoma (32; 37.64%), followed by Mucinous cystadenoma (13; 15.29%) and mature cystic teratoma (12; 14.12%). Serous cyst adenocarcinoma was the most common malignant tumour (5; 5.88%), followed by adult granulosa cell tumour (4; 4.7%).

Borderline mucinous tumour was the only borderline tumour. There were 2 cases of metastatic ovarian tumours where, one was Krukenbergtumour and another was extra

ovarian primary peritoneal carcinoma. In the study of Patil *et al.* [15] out of the total 109 surface epithelial tumors, 84.4% were benign, 0.91% was borderline and 14.67% were malignant. Benign surface epithelial tumors comprised 74.2% (92/124) of all benign tumors while their malignant counterpart formed 61.5% (16/26) of all malignant ovarian tumors.

Patil *et al.* [15] observed that serous cystadenoma (41.93%) was the most common benign tumor followed by mucinous cystadenoma (32.25%). Serous cystadenocarcinoma (38.46%) was the most common malignant tumor. Pradhan *et al.* [13] study observed that the commonest malignant tumor was from the surface epithelial tumours (6; 40%) followed by germ cell tumours (5; 33%), metastatic tumors (3; 20%) and sex cord stromal tumour(1; 7%). Sawant and Mahajan [8] reported that out of total 6 malignant cases, maximum 4 cases were of serous cystadenocarcinoma followed by 2 cases of endometrioid carcinomas and 2 cases of borderline serous tumour.

Conclusion

This study found that surface epithelial tumors were the commonest ovarian tumor in perimenopausal age group with a higher incidence of malignancy followed by germ cell tumor. The commonest benign tumour was serous cystadenoma and the commonest malignant tumour was serous cystadenocarcinoma. However, the sample size is small to make any definite opinion. Amongst malignant ovarian tumors delayed diagnosis is common as most patients present with abdominal discomfort, occasional pain and the patients usually present in late stage of the disease.

Conflict of Interest

Not available

Financial Support

Not available

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How to Cite This Article
Sharmin R, Masud AA, Khalid MS, Papry A, Dewan RK. Histomorphological pattern of ovarian tumor in a Tertiary Level Hospital, Dhaka, Bangladesh. International Journal of Clinical and Diagnostic Pathology. 2024;7(4):49-54.