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Clinicopathologic Evaluation of 290 Ovarian Teratoma Cases 6-Year Single - Center Experience

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Abstract

Introduction: To evaluate the clinical and pathological features of cases with ovarian teratoma diagnosed within 6 year's period.

Methods: A total of 290 patients with ovarian teratoma diagnosed at Tepecik Training and Research Hospital between 2012 and 2017 were evaluated retrospectively.

Results: Most (n=282:97.2%) of the cases had mature cystic teratoma and 8 (2.8%) cases had immature teratomas. The mean age of the cases with mature cystic teratoma was 36,44 ± 14,4 and the mean tumor diameter was 8,1 ± 4,2 cm. However 51.4% of the cases were in the reproductive period, 35.8% were in the perimenopausal and postmenopausal period. Laparoscopy was performed in 214 cases (75.8%) and laparoscopy in 68 (24.2%) patients. The operation type was cystectomy in 41.8%, and salpingooferectomy in 32.8% , and TAH + BSO in 25.9% of the cases.

Conclusion: The majority of ovarian teratomas form mature cystic teratomas. Mature cystic teratomas are mostly benign tumors seen in reproductive age. Laparoscopic surgery is an effective method of treatment and cystectomy is the appropriate treatment for the majority of cases. Malignant transformation is very rare, but should be kept in mind in elderly patients and larger tumors.

Keywords: Ovary, mature cystic teratoma, immature teratoma, malignant transformation

Introduction

Teratomas are classified as mature and immature teratomas .[1] They originate from germ cells. Mature cystic teratomas (dermoid cysts) are the most common benign ovarian tumors involving three germ layers. These tumors, which constitute 10-20% of all ovarian tumors, are most commonly detected in women aged 20-40 years . [2,3] They usually do not produce symptoms. They are diagnosed incidentally during routine physical examination, and radiological examinations performed for different reasons or pelvic surgery .[3] The tumor is unilateral in most cases.[4] Rupture, torsion and infection are the most common complications in mature cystic teratomas. [2] Malignant transformation is very rare.[5,6] Fertility sparing surgery with laparoscopy is recommended for the treatment of mature cystic teratomas because they are seen in the reproductive age group.[5] In this study, we retrospectively evaluated the clinicopathologic features of cases with ovarian teratoma diagnosed in our laboratory over a 6-year period.

Material and Methods

The clinical and pathological features of 290 patients histopathologically diagnosed as ovarian teratoma in the pathology department of Izmir Tepecik Training and Research Hospital between January 2012 and December 2017 in a 6-year period were reviewed retrospectively.

Inclusion criteria; In the ovarian materials sent to our pathology department between December 2012 and December 2017, all mature cystic teratoma, immature teatoma and mature teratoma with malignant transformation were included in the study.

Exclusion criteria: All other ovarian tumors and non-tumoral ovarian lesions were excluded.

Patient age, pregnancy status, maximum size and lateralization of the tumor, preoperative tumor markers (CA-125, CA 19-9), surgical treatment method (laparotomy - laparoscopy), surgical treatment modality (cystectomy, salpingoopherectomy, TAH + BSO (total abdominal hysterectomy and salpingoophorectomy), presence of complications, malignant transformation, frozen- section samples analyzed and their histopathology results were recorded from our hospital database.CA-15 and CA 19-9 values of the patients within one month before the operation were taken as the basis in the study. The values of cuttoff CA-15 and CA 19-9 were considered 35 U/ml and 37 U/ml respectively. All statistical analyses were performed using SPSS IBM Statistics 24 (IBM Corporation, Chicago, USA). Statistical evaluation of the data was performed parametric Peasrson correlation test and student t test. A P value of < 0.05 was considered to be statistically significant.

Results

A total of 290 cases with ovarian teratoma diagnosed in our department over a period of 6 years were included in the study. Of these, 282 (97.2%) were mature cystic teratomas and 8 (2.8%) were immature teratomas.The mean age of the patients with mature cystic teratoma was 36.44 ± 14.4 years (range 3 to 86 years).While 145 (51.4%) of the cases were in their reproductive period between the ages of 21-40 years, and 101 (35.8%) patients were in their perimenopausal or postmenopausal period. The mean tumor size was 8.1 ± 4.2 (1.1-26) cm. The tumor was located in the right ovary in 146 (51.8%) and in the left ovary in 110 (39%) cases. Bilaterality was detected in 26 cases (9.2%). Pregnancy was present in 22 (7.8%) cases. Demographic, clinical and pathological findings of mature cystic teratoma cases are given in Table 1.Laparotomy was performed in 214 (75.8%) and laparoscopy in 68 patients (24.2%). The type of operation was cystectomy in 118 (41.8%) and salpingoopherectomy in 91 (32.3%), TAH + BSO in 73 (25.9%) patients. Surgical treatment methods used in mature cystic teratoma cases and their distribution according to age groups are given in Tables 2 and 3, respectively.In the parametric Pearson correlation test, the relationship between operation type and age and tumor size was statistically significant ($p < 0.001$). There was no correlation between age and tumor size ($p = 0.706$). Laparotomy was the surgical method of choice for patients with advanced age and large tumor size.Frozen examination was performed in 167 (59.2%) of mature cystic teratoma cases. The diagnostic accuracy rate of frozen section examination was 99.4 percent. Squamous cell carcinoma was found in paraffin sections in a case with benign result in frozen examination.

Complications were seen in 11 cases (3.9%). Complications were torsion in 10 and perforation in 1 case. Two of these 10 patients had bilateral torsion.

The mean tumor diameter was 13.00 ± 3.71 cm (9-20) in patients with complications and was found to be significantly higher than the general tumor average.

Serum tumor markers CA-125 and CA-19-9 were studied in 218 (77.3%) and 143 (51%) cases with mature cystic teratomas, respectively. In these cases, the mean CA-125 , and CA 19-9 values were 30.71 (0.3-1595) U / ml and 79.86 (10.6-1209.11) U / ml, respectively. CA-125 (n=26 ;11.87%), and CA 19-9 (n=51 :35.41%).levels were above the normal ranges in indicated number of patients.

The mean tumor diameter was 10.8 cm in patients with a CA-125 level above normal. In 5 of these cases, the tumor was bilateral and complications were observed in 3 cases. The mean tumor diameter was 13.8 cm in patients with CA 19-9 levels above normal. There were complications in 2 and bilaterality in 9 cases. Malignant transformation was detected in 2 cases (0.7%) with mature cystic teratoma. Both of these tumors were in the morphology of squamous cell carcinoma. A macroscopic image of one of the cases with squamous cell carcinoma is seen in Figure 1. In this case, infiltrative epithelial tumor islands in desmoplastic stroma were observed in H&E sections of the samples taken (Figure 2).

The patients with this tumor were 62 and 64 years old, and the largest diameters of the tumors being 11 cm and 15 cm, respectively. A mature cystic teratoma was diagnosed as a carcinoid tumor of 0.4 cm in diameter. The patient was 67 years old and the teratoma was 6.5 cm in diameter.

Coexistence with other pelvic neoplasms was also detected in cases with mature cystic teratoma. Endometrial adenocarcinoma (n=2) and squamous cell carcinoma in uterine cervix (n=2) were also detected. The association with ovarian neoplasms was also remarkable. The accompanying conditions included mucinous cystadenoma in 7, serous cystadenoma in 2, borderline mucinous tumor in 1", and borderline endometrioid tumor in 1 case. Of the 290 ovarian teratomas, 8 (2.7%) had immature teratoma morphology. The mean age of these cases was 30.12 ± 12.67 (13-54) years. The median tumor size in evaluable 5 cases was 12.9 cm (5-24 cm). Histopathological examination revealed tumor Grade 3 in 4, Grade 2 in 1, and Grade 1 in 3 cases. Pregnancy was present in 2 patients.

Conclusion

Mature cystic teratomas are the most common benign ovarian tumors. [2] They are generally seen in women of reproductive age and incidental detection rates are high.[3] in our study, the mean age of the patients was 36.44 ± 14.4 (3-86) years, and 51.4% of the patients were women aged 20-40 years.

It has been reported in various studies that mature cystic teratomas constitute 22-40% of tumors detected during pregnancy and 0.8-12.8% of mature cystic teratomas are associated with pregnancy.[6] In our series, 22 (7.8%) of the cases had pregnancy which were compatible with the literature data.

Mature cystic teratomas usually show unilateral localization. Bilaterality rates were reported to be between 7-15% in different studies. [4] In our series, bilaterality rate was 9.2%.

In our study, the mean tumor diameter was 8.1 ± 4.2 (1.1-26) cm. While 48.9% of the tumors had a diameter of 5-10 cm and 7.09% had a diameter of more than 15 cm. In various studies, the rate of tumors with a diameter of 5-10 cm has been reported as 60% and the proportion of tumors with a diameter of more than 15 cm has been reported as approximately 10% .[2,6] The rates in the literature are similar to those in our series.

Tumor markers are frequently used to differentiate between benign and malignant ovarian masses. Although there are no tumor markers specific to mature cystic teratoma, it has been suggested that the combined use of tumor markers such as CA-125, CA 19-9, CA 15-3, AFP may be useful in differential diagnosis. [5,10] Among them, CA 19-9 is the most frequently elevated tumor marker.[11] In our study, serum CA 19-9 level was high in 35.41% of the patients. This rate was consistent with the literature.

Torsion is the most common complication associated with mature cystic teratomas. Torsion rate has been reported to be 3-16% in various studies.[6] In our study, torsion was seen in 3.5% of the cases and the mean tumor diameter was larger than the average diameter of all tumors.

Malignant transformation in mature cystic teratomas is a very rarely seen (1-3%) serious complication. The most common malignant transformation is the development of squamous cell carcinoma.[2,8] Serum levels of CA 125 and CA 19-9 have been reported to be high in more than 70% of these cases. [9] The most important risk factors for malignant transformation are advanced age and large tumor size (> 10 cm).[2,6,8] In our study, squamous cell carcinoma was seen in the background of mature cystic teratoma in 2 cases (0.7%). Both of these patients were in their postmenopausal period and the tumor size was over 10 cm. CA-125 was found to be slightly elevated in one patient and CA 19-9 in the other. In the light of this information, it is thought that markers such as CA-125, CA 19-9 as well as the size of the mass may be important for malignant transformation during the follow-up of ovarian masses.

Since mature cystic teratomas are mostly seen in the reproductive age, preservation of fertility is important and therefore the treatment of choice should be as conservative as possible. It is usually sufficient to remove the cyst with its wall.[8] In our study, cystectomy was the most preferred surgical method. Oophorectomy or TAH + BSO was performed in postmenopausal patients. The most important factor determining the mode of operation is age, fertility status of the patients and the presence of other accompanying pathologies. [6]

In recent years, laparoscopic surgery has been used as a safe and effective method in the treatment of mature cystic teratomas. Laparoscopic method was used by Kahraman et al. [8], and Hurşitoğlu et al. [1] in 62.6, and 45.5% of their cases, respectively.. However, laparoscopic surgery rate was low in our series (24.2%). We believe that this may be related to the preference of clinical doctors and / or the patient's suitability for the operation.

Immature teratomas constitute less than 1% of teratoma cases.[12] The rate of immature teratoma in our study was higher than that reported in the literature. (2.7%). This higher rate may be related to our being a reference hospital. Most immature teratomas occur in the first two decades. In our series, the mean age of the cases with immature teratoma was 30.12 ± 12.67 (13-54) years. The mean tumor diameter of immature tumors detected in our patients was significantly higher than the mean diameter of the mature cystic teratomas. (12.9 cm)

In conclusion, mature cystic teratomas can be seen at any age, but they are the most common ovarian tumors seen in women during their reproductive age. Since they are usually benign tumors seen in 2 to 4.decades of life cystectomy is considered to be sufficient for their treatment. Surgical treatment of mature cystic teratoma is selected according to the patient's age, fertility status and the presence of additional

pathologies. Malignant transformation is unlikely. However, this possibility should be considered in large (> 10 cm) tumors seen in patients over 40 years of age especially with increased CA 19-9 levels. In these cases, frozen-section analysis performed during the operation may be helpful in determining the type of operation. Multiple samples obtained from solid areas during pathological examination is important in order not to miss malignancy and immature teratoma cases.

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Legends Tables and Graph

Table 1: Demographic, clinical, and pathologic findings of cases with mature cystic teratoma.

Mean age year (min-max)	36.44±(3-86)
Reproductive period	135 (51.4%)
Peri/Postmenopausal period	101 (35. 8%)
Pregnancy	22 (7.8%)
Location	
Right ovary	146 (51.8%)
Left ovary	110 (39%)
Bilaterality	26 (9.2%)
Mean tumor diameter (cm)	8.1±4.2 (1.1-26)
Complication	11 (3.9%)
Increased CA-125 level	26 (11.87%)
Increased CA19-9 level	51 (535.41)

Table 2: Surgical methods used in the cases with mature cystic teratoma

Laparotomy	214 (75.8%)
Laparoscopy	68 (24.2%)
Type of surgery	
Cyst excision	118 (41.8%)
Salpingoophorectomy	91 (32.3%)
TAH+BSO	73 (25.9 %)

Table 3: Distribution of surgical methods according to age groups

Age	Cystectomy	Oophorectomy	TAH+BSO
< 20	27(22.8%)	8 (8.8%)	-
21-40	87 (73.7%)	60 (66%)	-
> 41	4 (3.3%)	23 (25.2%)	73 (100%)
Total	118	91	73

Figure 1: Squamous cell carcinoma in mature cystic teratoma

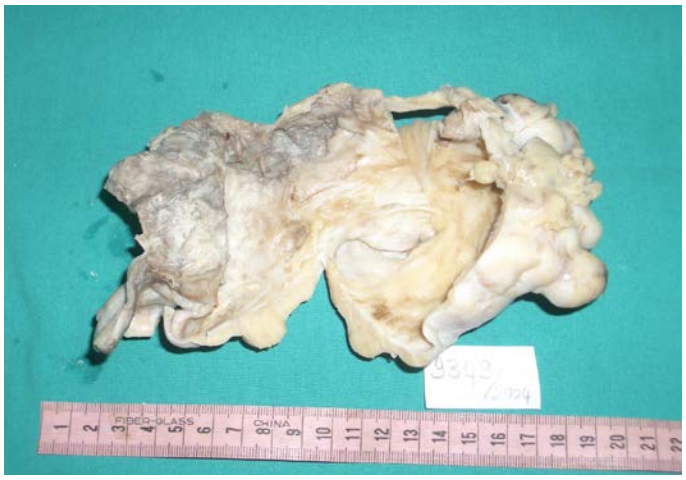

Figure 2: Squamous cell carcinoma in mature cystic teratoma (H&E x100)