

# A clinico-pathological evaluation of 194 patients with ovarian teratoma: 7-year experience in a single center

Ocena kliniczno-patologiczna 194 pacjentek z potworniakiem jajnika: 7-letnie doświadczenie jednego ośrodka

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## Abstract

**Objectives:** To evaluate patients diagnosed with teratoma over a period of seven years with regard to their general characteristics and treatment methods.

**Material and Methods:** A total of 194 patients histologically diagnosed with ovarian teratoma (mature or immature) in the years 2005-2012 at the Ege University Gynecology and Obstetrics Department were evaluated.

**Results:** Average patient age was  $34.3 \pm 2.16$  years. Of these, 169 (86.3%) were premenopausal and 27 (13.7%) postmenopausal; average cyst diameter, measured during the surgery, was  $6.9 \pm 0.63$  cm. While the teratoma had been an asymptomatic finding in 148 (75.5%) patients, 48 (24.5%) were symptomatic. In 107 patients (54.5%) a laparotomy and in 89 (45.5%) a laparoscopy were performed. The presence of torsion was observed during surgery in 9 (4.5%) patients. The 49 (55%) patients who underwent laparoscopic cystectomy experienced a rupture during the intervention, with no cases of clinical chemical peritonitis following the surgery.

**Conclusion:** Caution must be exercised with regard to possible cyst rupture in elderly patients and those with large dermoids; an laparoscopic approach may be reserved for younger patients. In case a rupture occurs during the operation, abundant peritoneal lavage is indicated; in order to limit risks during the controlled excision of the cyst an Endobag should be used if possible.

Key words: **teratoma / pregnancy / adnexal masses /**

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Hursitoglu Behiye Seda et al. A clinico-pathological evaluation of 194 patients with ovarian teratoma: 7-year experience in a single center.

## Streszczenie

**Cel:** Ocena pacjentek z rozpoznanym potwornikiem w odniesieniu do charakterystyki ogólnej i metod leczenia.

**Materiał i metoda:** Grupę badaną stanowiło 194 pacjentki z potwierdzonym histologicznie potwornikiem (dojrzałym lub niedojrzałym) w latach 2005-2012 w Ege University w Klinice Ginekologii i Położnictwa.

**Wyniki:** Średnia wieku pacjentek wynosiła 34.3±2.16 lat. Pacjentek w wieku przedmenopauzalnym było 169 (86.3%) a w pomenopauzalnym 27 (13.7%); średni rozmiar guza zmierzony w trakcie operacji wynosił 6.9 ±0.63cm. U większości pacjentek 148 (75.5%) guz nie dawał objawów, natomiast w 48 (24.5%) przypadkach wystąpiły objawy. U 107 (54.5%) pacjentek wykonano laparotomię a u 89 (45.5%) laparoskopię. Skręcenie guza obserwowano w trakcie operacji u 9 kobiet (4.5%). Spośród pacjentek, które przeszły laparoskopowe usunięcie torbieli, u 49 (55%) guz pękł podczas operacji, jednak nie obserwowano chemicznego zapalenia otrzewnej po operacji.

**Wnioski:** Należy zachować szczególną ostrożność w związku z możliwym pęknięciem torbieli u starszych pacjentek oraz w przypadkach dużych guzów. Techniki laparoskopowe należy zarezerwować dla młodszych pacjentek. Należy wykonać płukanie otrzewnej jeśli w czasie operacji dojdzie do pęknięcia torbieli. Aby zmniejszyć ryzyko pęknięcia w trakcie usuwania torbieli wskazane jest użycie endobagu.

Słowa kluczowe: **potworniak / ciąża / guzy przydatków /**

## Introduction

Teratomas are classified as cystic (dermoid) or immature. The term “dermoid” was later applied to mature cystic teratomas due to frequent occurrence of skin-related structures in these cysts. Mature cystic teratoma, or dermoid cyst, is one of the most frequent ovarian tumors, with a prevalence of 20% [1, 2]. They are diagnosed with the highest frequency in patients aged 20-40 [3, 4]. They are bilateral in 10-15% of cases [2]. Approximately 90% are unilateral, with an average diameter of 5-10 cm. Tumor diameter and patient age are the most important factors predictive of a malignant transformation [4, 5].

Complications associated with dermoid cysts include torsion, rupture and infection [6, 7]. The possibility of the development of a malignancy out of a mature cystic teratoma should be considered, especially in case of tumors with a diameter larger than 10 cm, in women aged over 45 [8]. The most often reported malignancies are squamous-cell carcinomas.

The definitive, and only, treatment of dermoid cysts is surgical, with no room for drug treatment. Even though the laparoscopic approach to the treatment of ovarian cysts has certain advantages over laparotomy [9, 10], the latter is often preferred because of the danger of cyst rupture during surgery, which causes chemical peritonitis.

We performed a retrospective evaluation of the general characteristics, cyst size and localization, concomitant pathology or pregnancy, and surgical treatment methods, in patients diagnosed with a dermoid cyst.

## Material and Methods

A total of 196 patients, diagnosed histologically with teratoma between the years 2005 and 2012, were evaluated retrospectively. The patients were identified by searching the archives of the Ege University Gynecology and Obstetrics Department, Izmir. Inclusion criterion for the study was the diagnosis of either mature or immature teratoma. The basic characteristics of the patients were recorded. Frequencies were expressed as absolute numbers and percentages.

## Results

Average patient age was 34.3 ± 2.16 years. Of these, 169 (86.3%) were premenopausal and 27 (13.7%) postmenopausal; average cyst diameter, measured during the surgery, was 6.9 ± 0.63 cm. The complaints of the patients are shown in Table I. The presence of torsion was observed during surgery in 9 (4.5%) cases. No cyst rupture was observed in any of the patients. Surgical procedure utilization is summarized in Table II.

The 49 (55%) patients who underwent laparoscopic cystectomy experienced a rupture during the intervention. Abundant lavage was applied to the patients in whom a rupture had occurred. None of the patients had a chemical peritonitis in the post-operative period.

The average cyst diameter in patients who experienced torsion was 10 ± 1 cm. The cyst was in the left ovary in 75 (38%) and in the right in 104 (53%) of cases; bilateral cysts were found in 17 (9.9%) patients.

A dermoid cyst had been discovered during cesarean section in 11 patients. Only one patient had an immature teratoma. Concomitant findings were cystadenoma as a synchronous focal lesion, which was serous in 2 patients and mucinous in 3, a squamous-cell carcinoma arising on a mature cystic teratoma in 1, and a carcinoid tumor in another patient.

## Discussion

While surgery is traditionally recommended for complex formations like a dermoid cyst, it encounters some measure of diffidence due to its possible effect on fertility in younger patients. The frequency of surgical intervention increases proportionally to the cyst dimensions. The average cyst diameter in our study was 6.9 ± 0.63cm. Benign cystic teratomas are encountered mostly at the age of 20-40 years [11]. Patients aged 30 to 50 made up a large majority (66%) in the study reported by Özgür *et al.*, a proportion larger than usually reported in the published studies [12]. Average patient age in our study was 34.3 ± 2.16

The incidence of ovarian tumors during pregnancy is of the order of 0.1% [13]. Published reports are listed for 17 cases of teratoma. Of the 15,328 pregnant women followed up at our

Hursitoglu Behiye Seda et al. A clinico-pathological evaluation of 194 patients with ovarian teratoma: 7-year experience in a single center.

**Table I.** Complaints of the patients.

Complaints	n	%
Asymptomatic	148	75.5
Symptomatic	48	24.5
Abdominal pain	44	22.4
Nausea/vomiting	2	1.02
Abdominal pain and nausea/vomiting	2	1.02

**Table II.** Summary of the surgical procedure utilization.

Surgery	n	%
Laparotomy	107	54.5
Cystectomy	43	
Ovariectomy	29	
TAH-BSO	30	
TAH-USO	5	
Laparoscopy	89	45.5
Cystectomy	81	
Ovariectomy	7	
TLH-USO	1	

**TAH-BSO:** Total abdominal hysterectomy and bilateral salpingo-oophorectomy;  
**TAH-USO:** Total abdominal hysterectomy and unilateral salpingo-oophorectomy;  
**TLH-USO:** Total laparoscopic hysterectomy and unilateral salpingo-oophorectomy.

clinic in the same period, 8,754 underwent a cesarean section and a teratoma was found during surgery in 11 (0.12%) of them. A total of 12 pregnant women were operated on for an adnexal mass during the same period; dermoid cysts of 10cm and 20cm diameter, respectively, were found in 2 (16.6%) patients who were both in their second trimester. The lesions were surgically removed. The incidence of teratoma in our entire population of pregnant women was 0.08% and that of ovarian tumors 0.2%, similarly to what is reported in relevant publications. Walid *et al.* have indicated that bilateral dermoid cysts can be successfully treated during pregnancy, especially in the second trimester [14]. Özgür *et al.* report a bilateral dermoid cyst incidence of 0.2% during pregnancy [12]. As for our study population, a bilateral dermoid cyst was found in 1 (0.5%) patient and treated by bilateral cystectomy during a cesarean section.

The important prognostic factors for malignant transformation are patient age and tumor diameter [4, 5]. In our study, 2 patients among all those diagnosed with teratoma (1.02%) showed a malignant transformation, in the shape of a squamous-cell carcinoma on a mature cystic teratoma, and a carcinoid, respectively.

Malignant transformation of mature cystic teratoma is a very rare occurrence, in around 1-2% of patients; most often in the histological form of a squamous-cell carcinoma [3, 4, 15]. The diameter of the mature cystic teratomas in which these transformations were found was 5 cm and 8 cm, respectively. The patients developing these tumors were aged 54 and 68. Even though our case number was statistically too small to look for a correspondence with the published reports, they are a reminder that the possibility of a malignancy should be kept in mind with patients over 45 and tumors of 10 cm or a larger diameter [8].

Torsion, a frequent complication of mature cystic teratomas, is reported in 32% of published cases, while it was observed at a different frequency of 4.5% in our study [11]. The symptoms of mature teratoma are often abdominal pain or fullness. While the teratoma had been an asymptomatic finding in 148 (75.5%) patients, 48 (24.5%) were symptomatic. Of the latter, 44 (22.4%) complained of abdominal pain only. This is similar to the proportions reported in the literature [16-18]. The published frequency of bilateral occurrence varies from 8% to 15% [12]. In our review, this incidence was 9% (17 cases), compatible with the published reports.

Dermoid cysts are increasingly being treated by laparoscopic methods and cyst rupture has been recorded in 54% of these cases [17, 19, 20]. In our study, too, cyst rupture occurred during the operation in 49 patients (55%). Rupture often happens during the dissection of the cyst and has no correlation with its dimensions or location [21, 22]. A chemical peritonitis has been observed to develop in several cases, due to peritoneal contamination from a ruptured cyst [23, 24].

In our study the spillage rate was 55% per patient, with no cases of clinical chemical peritonitis following the surgery. The laparoscopic approach to dermoid cyst treatment is often avoided because of this complication. Campo *et al.*, however, have proposed performing cystectomy inside an Endobag, noting that peritonitis could be avoided by this method, which also shortens the procedure duration [25].

## Conclusion

In conclusion, the risk of malignant transformation must be kept in mind, especially with advanced age and large dermoid cysts. Attention should be paid to avoid a rupture of the cyst, also considering the possibility of spilling of the malignant cells. The laparoscopic approach should be reserved for younger patients. In case a rupture occurs during the operation, abundant peritoneal lavage is recommended.

In order to limit the risk during the controlled excision of the cyst, an Endobag should be used if possible. As for pregnant patients, especially if a dermoid cyst larger than 10 cm is suspected, a surgical intervention during the second trimester should be considered. The patients should be evaluated for adnexal torsion, the most frequent complication, especially in the presence of pain.

Hursitoglu Behiye Seda et al. A clinico-pathological evaluation of 194 patients with ovarian teratoma: 7-year experience in a single center.

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