

# Laparoscopic management of dermoid cysts in patients of reproductive age

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## Abstract

**OBJECTIVE:** Ovarian dermoid cysts are one of the most common germ cell tumors in women. The aim of the study was to analyze the use of laparoscopy in dermoid cysts treatment in women of reproductive age.

**MATERIAL AND METHODS:** The studied material consisted of 95 patients, aged 17–49, operated on because of dermoid cyst suspicion at the 1<sup>st</sup> Department of Obstetrics and Gynecology, Medical University of Warsaw, in the years 1996–2005. All the patients had pre-operative CA-125 antigen evaluation and transvaginal sonography with Doppler assessment of the ovarian pathology. All the women with tumors less than 8 cm in diameter were qualified for laparoscopic management.

**RESULTS:** The majority of patients were below 40 years of age (86 women; 90.5%). Out of 95 studied cases, 93 (97.9%) had the cyst removed during laparoscopy, mostly elective. Dermoid cyst enucleation was the most commonly applied procedure, while oophorectomy was the least frequent. The whole gonad was removed in 33 patients (34.7%), generally because of the total loss of functional ovarian tissue surrounding the cyst (28 women; 29.5%). All the extracted material was submitted for a histopathological examination – the diagnosis of mature ovarian cystic teratoma was confirmed in 100% of cases. The correspondence of pre-operative sonographic imaging and intraoperative macroscopic assessment was evaluated. In 85 (89.5%) operated patients an ovarian tumor was earlier described as a dermoid cyst.

**CONCLUSIONS:** Laparoscopic treatment of ovarian dermoid cysts is a safe method, offering many advantages in comparison to classical surgery. However, proper early qualification, based on medical history, gynecological and sonographic examination is of great importance.

## Introduction

Ovarian dermoid cysts are one of the most common germ cell tumors in women. They contribute to 10–15% of all ovarian neoplasms [4] and even up to 25% in girls below 12 years of age [14]. Bilateral ovarian cystic teratomas appear in 10% of women suffering from this pathology [3,6]. They belong to a group of benign tumors deriving from reproductive cells and are usually diagnosed before the age of 40 [3].

Laparoscopy is an increasingly common approach in benign ovarian tumor treatment. It is crucial especially in women of reproductive age to perform the most conservative operation possible in order to save functional ovarian tissue. It is essential to enucleate the cyst without tearing its wall, because of the risk of chemical peritonitis. Laparoscopic management offers the advantage of shorter hospitalization, fewer postoperative complications and fast recovery [9].

The aim of the study was to analyze the use of laparoscopy in the treatment of dermoid cysts in women of reproductive age.

## Material and methods

The studied material consisted of 95 patients, aged 17–49, operated on because of dermoid cyst suspicion at the 1<sup>st</sup> Department of Obstetrics and Gynecology, Medical University of Warsaw, in the years 1996–2005.

All the patients had pre-operative CA-125 antigen evaluations and transvaginal sonographic assessments of the ovarian pathology, supplemented by Doppler evaluations of vascularity with resistance (RI) and pulsatility indices (PI). B-K Medical Viking 2400 ultrasound equipment with 5–9 MHz transducers was used (previously it was Ultramark 9 HDI ATL). The diagnosis of dermoid cyst in ultrasound examination was based on the following characteristics: solid, hyperechogenic areas (both homo- and heterogenic); liquid spaces with hyperechogenic parietal foci and mixed cystic and solid changes of uneven outline. The morphological index according to Sassone was used in tumor characteristics assessment: the sum of less than 9 points, together with poor vascularity and highly resistant blood flow (RI>0.4) supported the diagnosis of a benign lesion.

All the women with tumors less than 8 cm in diameter were qualified for the laparoscopic management. Laparoscopy was performed typically in general anesthesia with endotracheal intubation. Karl Storz optics and Karl Storz, Olympus, Stryker and Pajunk instruments were used. After the insufflation of the peritoneal cavity, the small pelvis organs were assessed. The suspicion of malignancy was an indication for conversion to laparotomy.

The range of the operation depended mainly on the tumor size, patient's age and presence of healthy functional ovarian tissue. A removed lesion was extracted from the abdomen with the use of a special endobag. Intraoperative microscopic examination was performed only when the tumor looked suspicious macroscopically.

## Results

The age of the patients was analyzed (Figure 1). The biggest subgroup was represented by women aged 31–35 (26 patients; 26.3%). The majority was below 40 years of age (86 women; 90.5%). Out of 95 studied cases, 93 (97.9%) had the cyst removed during laparoscopy, while laparotomy had to be applied in two remaining cases (2.1%) due to the size of the tumor (10 cm) and co-existing multiple uterine myomas. Elective laparoscopy was performed on 91 (95.9%) patients. The other four cases (4.1%) were urgent due to clinical presentation of increasing abdominal pain: the first had an additional hemorrhagic cyst in the opposite ovary, the other two had bilateral teratomas and the fourth had no additional findings. Moderate abdominal pain was reported by 29 women (30.5%), 8 (8.4%) were diagnosed because of sterility and one reported secondary amenorrhea. The remaining 53 patients (55.8%) had no complaints and the presence of the tumor was found during a controlled gynecological examination. Three patients (3.1%) had a history of dermoid cyst enucleation in the past. CA-125 was in normal range in all patients.

The size of the tumor was then assessed (Figure 2). The average size of all tumors reached 5.8 cm. Almost half of them (47%) were cysts 5 to 8 cm in diameter. In 11 cases there was a need to withdraw the contents of the cyst by controlled suction prior to its extraction in order to decrease the volume of the tumor. In 18 (21%) operated women, the rupture of the cyst took place, followed by thorough lavage of peritoneal cavity.

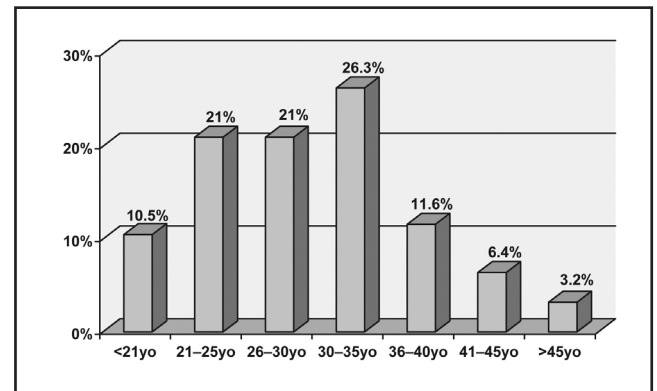


Figure 1. The age groups of operated patients [yo – years old]

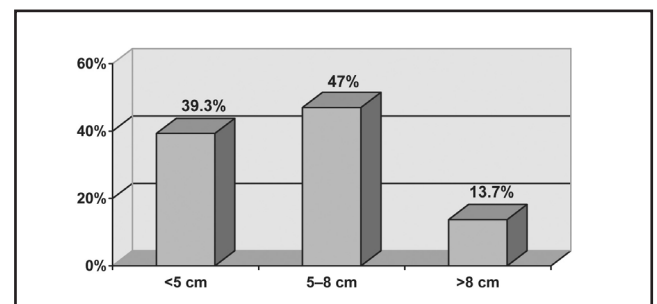


Figure 2. The size of operated dermoid tumors.

**Table 1.** The range of performed laparoscopic surgery.

Operation range	Number of patients	%
Cyst enucleation	62	65
Adnexectomy	20	21
Oophorectomy	13	14
Excision of other changes in reproductive tract	27	28.4
Sample biopsy of the opposite ovary	29	30.5

The range of the operation was analyzed as well (Table 1). Dermoid cyst enucleation was the most commonly applied procedure, while oophorectomy was the least frequent. The whole gonad was removed in 33 patients (34.7%), mostly because of the total loss of functional ovarian tissue surrounding the cyst (28 women; 29.5%). Additional procedures were performed in 27 patients: enucleation of the ovarian cyst on the opposite side (10 cases; 10.5%), perioviductal cyst removal (8 cases; 8.4%) or enucleation of uterine myoma (9 cases; 9.5%). In 11 cases there was a need to withdraw the contents of the cyst by controlled suction prior to its extraction in order to decrease the volume of the tumor.

In 18 (21%) operated women, a rupture of the cyst took place: in 16 (88.9%) during enucleation and in 2 (11.1%) while oophorectomy was being performed. In case of spillage, the peritoneal cavity was thoroughly lavaged with large amounts of 0.9% saline solution.

The postoperative period was uncomplicated in 94 patients (98.9%). Only one woman developed upper airways infection following laparoscopic treatment.

All the extracted material was submitted for a histopathological examination (Table 2) and the diagnosis of mature ovarian cystic teratoma was confirmed in 100% of cases. In 7 out of 10 women, who had a lesion in the opposite ovary excised, dermoid cyst was also recognized. Six patients (6.3%) had two different pathological changes within one ovary.

Finally, the correspondence of pre-operative sonographic imaging, intraoperative macroscopic assessment and histopathological examination was evaluated. In 85 (89.5%) operated patients an ovarian tumor was described as a dermoid cyst in sonographic examination. The size of the tumor assessed during laparoscopy corresponded to the size described in ultrasound examination in 55 (57.9%) women.

**Table 2.** Results of histopathological examination of the removed lesions.

Removed material	Histopathological diagnosis	Number of patients	%	
<b>Ovarian tumor</b>	Mature teratoma	95	100%	
	Endometrial cyst	3	3.16%	
	<b>Coexisting change in the same ovary</b>	Hemorrhagic cyst	2	2.1%
		Ovarian goiter	1	1.05%
<b>Lesion in the other ovary</b>	Mature teratoma	7	7.3%	
	Endometrial cyst	1	1.05%	
	Hemorrhagic cyst	1	1.05%	
	Simple cyst	1	1.05%	
<b>Accompanying pathologies</b>	Leiomyoma	9	9.5%	
	Perioviductal cyst	8	8.4%	

## Discussion

Laparoscopy is the method of choice in mature ovarian cystic teratomas management. Literature data point to a tendency of the most conservative, tissue-saving treatment possible, which can be obtained by enucleating cysts. Such management is especially important for young patients of reproductive age, who want to preserve fertility. Laparoscopy offers the advantage of shorter operation time, less bleeding, faster recovery and less adhesion formation in comparison to laparotomy, which surely influences fertility as well.

The average diameter of cysts in our material (5.89 cm) is comparable to other studies: 4.7 cm described by Berg et al. [2] and 5.5 cm in Zupi et al. material [18]. Mettler et al. [11] presented a comparative study, in which the size of cysts operated on in laparoscopy averaged 4.5 cm, while in laparotomy 8.2 cm. In the presented study laparotomy was performed in two cases, where the size of cysts was more than 10 cm. Almost half of the ovarian tumors in our material measured 5 to 8 cm, similar to other studies [4,16]. However, Sunoo [16] claims that laparoscopy may be performed on tumors up to 18 cm. All the cysts in our study were removed from the abdomen with the use of a special endobag. Other methods of extraction are also described: through trocars [13] or colpotomy [13,17].

In 53 out of 95 studied patients (55.8%) the tumors were asymptomatic, while in the study by Chechia et al. [3] only 18% of all dermoids had no clinical presentation. The torsion of such cysts is also well documented. Pansky et al. [14] described torsion in 25% of all cysts in girls aged 3 to 12 years. Ding et al. [5] presented a case of a 25-year-old patient with a twisted dermoid cyst 9.7 by 6.2 cm, which was untwisted and enucleated. However, in our material tumor torsion was rather rare – it happened in one case of a 24-year-old woman with increasing but moderate abdominal pain – intraoperatively the cyst was rotated three times around its own axis. Because of the lack of functional tissue, adnexectomy was performed.

Bilaterally mature ovarian teratomas are also quite common and such findings in our material [7 cases;

7.3%] are comparable to literature data: 10% in Chechia's et al. [3] and 10.6% in the study by Lech et al. [8].

While analyzing the range of the operation, less cysts were enucleated in our material – 65% vs 71% [2] or 75.4% [13]. Zupi et al. [18] saved all operated ovaries (55 cases). However, patients who had oophorectomy performed in our material were usually over 35 years old and finished reproduction.

Laparotomy had to be performed in two cases (2.1%), both because of the tumor size. Such percentage is comparable with other studies. Mettler et al. [11] performed laparotomy in 1.87% of cases, half because of the tumor size and coexisting adhesions and the rest because of malignancy confirmed by intraoperative histopathological examination. Kocak et al. [7] operated on 47 women and converted to laparotomy in 2 (4.3%) patients: malignant process and sigmoid damage.

All patients operated on in our study had the ovarian pathology initially assessed after the introduction of trocars into the peritoneal cavity. When the lesion looked suspicious intraoperative histopathological examination was performed, however, in our material only mature teratomas were recognized.

No intraoperative complications, such as increased bleeding, bowel or ureter damage, occurred in our study. Kocak et al. [7] described bowel damage in 2.1% of cases. Berg et al. [2] and Nezhat et al. [13] had no intraoperative complications as well. The rupture of the dermoid cyst during laparoscopy took place in 21% of cases, while in Nezhat's et al. [13] material it equaled 48%.

The postoperative period was uneventful in 94 (98.9%) of patients. Despite the spillage of the cyst during laparoscopy in as many as 21% of cases, we had no chemical peritonitis. Kocak et al. [7] and Mecke et al. [10] published similar observations. According to literature, such a dangerous complication occurs only in 0.2% of operated patients [13]. Precise lavage of the peritoneal cavity decreases the incidence of chemical peritonitis. It is worth remembering, however, that the rupture and spillage prevention is not only important because of the risk of chemical peritonitis. Supposing a patient is misdiagnosed preoperatively and the cyst is ruptured during laparoscopy – if histopathological examination reveals ovarian malignancy, iatrogenic dissemination of the disease takes place at the time of operation and FIGO staging changes unfavorably. Therefore it is crucial to prevent it if possible.

## Conclusions

Laparoscopic treatment of ovarian dermoid cysts is a safe method, offering many advantages in comparison to classical surgery. However, proper early qualification, based on medical history, gynecological examination and sonographic assessment is of great importance. Laparoscopic management of adnexal changes is of crucial meaning especially for reproductive age women because of the conservative operation range.

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