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## GYNAECOLOGY

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# Laparoscopic findings of Suspected Benign Adnexal Masses

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### ABSTRACT

**Objective** To determine the percentage of various adnexal masses and to evaluate the feasibility, safety, advantages and awareness associated with laparoscopic management in patients who had suspected benign adnexal masses.

**Design** Retrospective study

**Setting** Endoscopic Unit of the Department of Obstetrics and Gynecology, Siriraj Hospital

**Subjects** Medical and laparoscopic surgical records of 292 patients with various clinical diagnoses, who had suspected benign-adnexal masses and underwent laparoscopy from January 1998 to December 2000

**Results** Patients ages ranged from 17 to 76 years, with a mean of  $33.1 \pm 14.6$  years. The most common pre-operative diagnosis was endometriosis (54.1% of all the cases), 25.3% was other benign ovarian tumors in which functional cyst was the most common (31.1%), endometrioma was found in 23% of cases and 20.3% of cases had dermoid cyst. Overall, benign pathologic conditions were found in 99.7% (291 / 292) of patients. The mean sizes of functional cyst, other masses and neoplastic cyst were  $3.1 \pm 2.3$  cm,  $3.9 \pm 3.0$  cm, and  $4.3 \pm 2.8$  cm respectively. The size of neoplastic cyst was significantly greater than non-neoplastic mass. Only one malignant cyst was found in this study.

**Conclusion** Diagnostic laparoscopy to confirm the diagnosis and further management can be performed in the same setting, with low rate morbidity and short hospital stay. Unless symptoms are severe and acute, expectant management for 3 months of apparently benign ovarian tumor does not seem to cause significant risks for the patients and may allow spontaneous regression of functional cyst. Although laparoscopy is a microinvasive surgery, re-evaluation of the patient just prior to surgery is a must.

**Key words:** Benign adnexal mass, endometriosis, benign ovarian tumor, functional cyst neoplastic cyst, laparoscopy

The appropriate management of adnexal masses is one of the most controversial problems facing the gynecologists today. Although laparotomy is thought to be the standard of care, the advent of modern laparoscopy requires a rethinking of the appropriate surgical approach to adnexal masses.<sup>(1-7)</sup> Currently, laparoscopic procedures have been fully integrated into the routine gynecologic care and an ever-increasing number of additional surgical procedures are being approached laparoscopically. In general, the choice of laparoscopic route means shorter recovery period, less pain, outpatient management or shorter hospital stay, decreased cost, potentially decreased adhesion formation and blood loss, and cosmetic acceptance of the operative scar. Furthermore, early ambulation post laparoscopy leads to fewer respiratory complications and thrombo-embolic events.<sup>(8, 9)</sup> Numerous reports legitimized the use of operative laparoscopy to manage suspected benign adnexal masses, the benefit being reduced hospital stay and low morbidity.<sup>(7, 10-12)</sup>

Granberg et al, observed that the risk of a simple ovarian cyst diagnosed by ultrasonography being malignant was only 0.3 percent.<sup>(13)</sup> In prospective studies with transvaginal ultrasound, no malignant was ever observed in unilocular cysts.<sup>(14)</sup> In addition, the value of pelvic examination was supported in a study of 2623 healthy women in which the specificity of the pelvic examination for malignant disease was 99.9%.<sup>(15)</sup> By itself, a single CA-125 measurement is not helpful in distinguishing between benign and malignant pelvic masses because the positive predictive value is low (10%).<sup>(16)</sup>

The purposes of this study were to determine the frequency and percentage of various adnexal masses and to evaluate the feasibility, safety, advantages and awareness associated with laparoscopic management in patients who had suspected benign adnexal masses evaluated by history taking, pelvic examination and ultrasonography.

## Materials and Methods

The study was designed as a retrospective study. Medical and laparoscopic surgical records of 292

patients with various clinical diagnoses, who had suspected benign-adnexal masses and underwent laparoscopy from January 1998 to December 2000 in the Endoscopic Unit of the Department of Obstetrics and Gynecology, Siriraj Hospital, were retrospectively evaluated. Age of the patients ranged from 17 to 76 years, with a mean of  $33.1 \pm 14.6$  years. Characteristics of patients such as age, presenting symptom, pre-operative diagnosis, post-operative diagnosis, operative finding, operative procedure, number and size of cyst, histological finding and length of hospital stay were recorded and analyzed. Without CA-125 determination, pre-operative diagnosis was a clinical diagnosis based on history, physical examination and ultrasonographic findings. Although many patients had more than one complaint, the pre-operative diagnoses in this study represent the main indication for diagnostic laparoscopy. "Post-tubal sterilization" is the pre-operative diagnosis given for patients who underwent diagnostic laparoscopy to determine whether they were suitable candidate for reversal of sterilization. All masses caused by ectopic pregnancy were excluded in this study. Bilateral masses would be called when the same type of mass was found in both ovaries. The data were analyzed using SPSS version 10.0 and are expressed as percentage, mean with standard deviation (SD). Statistical comparisons were performed with student t-test and were considered statistically significant at  $P < 0.05$ .

## Results

Two hundred and ninety two patients with various clinical diagnoses who had suspected benign adnexal-masses and underwent laparoscopies in the Endoscopic Unit, Department of Obstetrics and Gynecology, Siriraj Hospital were evaluated. The average age was  $33.1 \pm 14.6$  years, ranging from 17-76 years. Only 6 cases are younger than 20 years of age, 1 case has functional cyst, whereas no malignancy was detected in this age group. There are 5 postmenopausal cases. Two cases had paratubal cyst, 1 case had no mass (spontaneous regression of functional cyst), 1 case had endometrioma and the last one had serous cystadenoma.

**Table 1.** Percentage of each pre-operative diagnosis

Pre-operative diagnosis	Number (cases)	Percent
Endometriosis	158	54.1
Benign ovarian tumor	74	25.3
Pelvic pain with ovarian cyst	27	9.3
Infertility with ovarian cyst	17	5.8
Post-tubal sterilization	5	1.7
Ectopic pregnancy	7	2.4
Chronic PID	4	1.4
<b>Total</b>	<b>292</b>	<b>100</b>

In this study 158 of 292 cases (54.1%) were clinically suspected to have endometriosis and 74 cases (25.3%) had clinically suspected benign ovarian tumor as shown in Table 1. In the clinically suspected endometriosis group, 131 cases (82.9%) had endometrioma and 17 cases (10.8%) had functional cyst. Table 2 shows the percentage of histological classification of various masses in pre-operative benign ovarian tumor group. Up to 20.3% of cases had no mass and 10.8% had functional cyst. 23% of cases had endometrioma and about 20% of cases had dermoid cyst. No malignancy was detected in this group.

Because no mass was detected in 15 cases, 277 cases who had adnexal mass were further analyzed. 231 cases (79.1%) had unilateral mass and 46 cases (15.8%) had bilateral masses. In the group of unilateral mass, one patient had both dermoid cyst and endometrioma in the right side of ovary. In the group of bilateral masses, one patient had both dermoid cyst and endometrioma in each side of ovary and the other had both follicular cyst and endometrioma in the right side and a follicular cyst in the left side. Finally, overall 233 unilateral masses and 94 bilateral masses were analyzed as shown in Table 3.

**Table 2.** Operative findings in pre-operative diagnosis of benign ovarian tumor

Pre-operative benign ovarian tumor		Frequency (N)	Percent
No mass	No Mass	15	20.3
Functional cyst	Follicular cyst	6	8.1
	Corpus luteum cyst	2	2.7
Other masses	Simple cyst	1	1.4
	Parovarian cyst	1	1.4
	Paratubal cyst	3	4.1
	Hydrosalpinx	2	2.7
	Serocele	3	4.1
	Subserous myoma	2	2.7
Neoplastic cyst	Dermoid cyst	15	20.3
	Serous cystadenoma	4	5.4
	Mucinous cystadenoma	3	4.1
	Endometrioma	17	23
Total masses		74	100

Up to 14.9% were functional cyst and 75.8% are neoplastic cysts. 64.5% of all masses or 89.4% of all bilateral masses were endometrioma.

Benign pathologic conditions were found in

99.7% of patients. Only one malignant cyst was found, endometrioid carcinoma arising in the right endometriotic cyst.

**Table 3.** The types and numbers of unilateral and bilateral adnexal masses

Types of mass		Laterality		Total mass (%)
		Unilateral (N)	Bilateral (N)	
Functional cysts	Follicular cyst	24	4	28 (8.5%)
	Corpus luteum cyst	21		21 (6.4%)
Other masses	Simple cyst	1	2	3 (1%)
	Parovarian cyst	3		3 (1%)
	Paratubal cyst	7		7 (2.1%)
	Hydrosalpinx	7		7 (2.1%)
	Tubo-ovarian abscess	3		3 (1%)
	Serocele	5		5 (1.5%)
	Subserous myoma	2		2 (0.6%)
Neoplastic cysts	Dermoid cyst	21	4	25 (7.6%)
	Serous cystadenoma	6		6 (1.8%)
	Mucinous cystadenoma	3		3 (1%)
	Fibroma	2		2 (0.6%)
	Endometrioma	127	84	211 (64.5%)
	Ovarian cancer	1		1 (0.3%)
Total masses		233	94	327 (100%)

Table 4. shows the correlation between size and neoplasticity. The mean sizes of functional cyst, other mass and neoplastic cyst are  $3.10 \pm 2.36$  cm,  $3.97 \pm 3.04$  cm and  $4.36 \pm 3.28$  cm respectively. Neoplastic cyst is significantly greater in size than non-neoplastic mass, including functional cyst, but comparable to the other mass group.

Diagnostic laparoscopy only was performed in 23.9 percent (70 / 292) of patients, 8 procedures (2.7%) were converted to laparotomy because the masses could not be dissected laparoscopically. That means

76.1 percent (222 / 292) of the patients having laparoscopic management, including 73 cases with minor surgery such as adhesiolysis, coagulation of endometriotic spots, tubal sterilization and LUNA, 145 cases with cystectomy, unilateral salpingectomy and/or oophorectomy, 1 case with bilateral salpingo-oophorectomy, 1 case with myomectomy and 2 cases with LAVH, as shown in table 5. 166 out of 292 patients (56.8%) underwent outpatient surgery, and the rest 43.2 %, had 1 day hospital stay. No serious complication was recorded.

**Table 4.** Correlation between the size and the neoplasticity

		Size of mass (N)				Mean $\pm$ 2SD (cm)
		2-3 cm	4-5 cm	6-7 cm	8 cm	
Functional cyst	Follicular cyst	18	10			3.10 $\pm$ 2.36
	Corpus luteum cyst	13	6	2		
Other mass	Simple cyst	2	1			3.97 $\pm$ 3.04
	Parovarian cyst	1	1	1		
	Paratubal cyst	6	1			
	Hydrosalpinx	3	2	2		
	Tubo-ovarian abscess	1		2		
	Serocele	1	4			
	Subserous myoma		2			
Neoplastic cyst	Dermoid cyst	6	13	5	1	4.36 $\pm$ 3.28
	Serous cystadenoma	1	2	2	1	
	Mucinous cystadenoma		2	1		
	Fibroma		1	1		
	Endometrioma	63	103	39	6	
	Ovarian cancer				1	
<b>Total masses</b>		<b>116</b>	<b>148</b>	<b>54</b>	<b>9</b>	<b>327</b>

**Table 5.** The frequency and types of laparoscopic procedure

Procedures	Number (N)	Percent
Diagnostic laparoscopy only	70	23.9
Adhesiolysis and / or coagulation	70	24.0
Tubal sterilization	2	0.7
LUNA	1	0.3
Cystectomy	122	41.8
Oophorectomy	2	0.7
Salpingectomy	3	1.0
Unilateralsalpingo-oophorectomy	18	6.2
Bilateral salpingo-oophorectomy	1	0.3
Myomectomy	1	0.3
LAVH	2	0.7
<b>Total</b>	<b>292</b>	<b>100</b>

## Discussion

Ovarian cysts are detected in female patients of all ages and can be functional or neoplastic in origin. Neoplastic cysts either benign or malignant, are managed surgically. The patient's age, the size of the cyst, and the ultrasound appearances are helpful in determining which ovarian cysts necessitate surgical excision and which need only observation. The combination of benign findings from pelvic examination, a benign ultrasound appearance and a cancer antigen 125 level within normal limits indicates a benign origin in practically all cases.<sup>(17)</sup> Numerous reports legitimized the use of operative laparoscopy to manage suspected benign adnexal masses, the benefit being reduced hospital stay and low morbidity.<sup>(7, 10-12)</sup> Diagnostic laparoscopy only was performed in 23.9 percent (70 / 292) of patients and up to 76.1 percent (222 / 292) of the patients in our study had laparoscopic management without any serious complication. Only were 2.7% (8/ 292) of cases converted to laparotomy because the masses could not be dissected laparoscopically. One hundred and sixty six patients (56.8%) could undergo outpatient surgery, whereas the rest of 43.2 percent (126 / 292) had 1 day hospital stay.

Pelvic endometriosis is the most common pre-operative diagnosis in our study, which is up to 54.1%. Most of masses (82.9%) in this group are endometrioma. This is a reason to explain why endometrioma is the most common adnexal masses found in our study, 57.9% (169/292) of cases or 64.5% (221/327) of masses. Grimes and Hughes reported that ovarian functional cysts were the fourth most common gynecological cause of hospital admission in the United States in the late 1980s.<sup>(18)</sup> Spontaneous regression of ovarian cysts was noted in 66.6% of children in whom ultrasonography was used to evaluate the ovarian cysts. This percentage is probably a fairly accurate reflection of the actual incidence of functional ovarian cysts in patients in this age group.<sup>(19)</sup> The exact incidence of functional cysts is difficult to determine in patients younger than 20 years of age. However, Breen and Maxson reported the incidence of functional cyst was 36% in patients in this age group who underwent

surgical treatment of an ovarian mass and estimated incidence of ovarian malignant disease is 8.3 to 22%.<sup>(20)</sup> Of 279 patients with an ovarian mass in the study of Spanos,<sup>(21)</sup> 73% had functional cysts that regressed spontaneously. The other 74 patients (27%) had neoplastic cysts, 6.7% of which were malignancy. The incidence of malignant disease for the entire group was 1.8%. Functional cyst is the second most common mass found during operation in our study, 16.1% (47/ 292) of cases or 14.9% (49/327) of masses (table 3). Dermoid cyst is rather common cyst, about 20%, in pre-operative benign ovarian tumor group. However, no any mass was detected in 20.3% (15/74) of patients who had suspected benign ovarian tumor and 10.8% of cases in this group had functional cyst (table2). Because most cases in our hospital have to wait for laparoscopy about 1-3 months after clinically diagnosed. The spontaneous regression of functional cyst rather than missed diagnosis would be the cause of no mass detected in benign ovarian tumor group. That means functional cyst seems to be the most common cyst in suspected benign-ovarian tumor, up to 31.1% (23/74). To avoid unnecessary surgery and problem of prosecution in this group, such cysts should be managed by observation unless symptoms are severe and acute. Although diagnostic laparoscopy is an microinvasive surgery, re-evaluation of the patient just prior to surgery is a must.

Regardless of the patient's age and the ultrasonographic features of the cystic contents, the size of cyst and the rate of regression are directly correlated. The frequency of spontaneous regression is 82.6% for cysts 4 cm or smaller, 63.4% for cysts 4 to 6 cm; and 28.6% for cysts 6 to 8 cm. The period of complete regression can be as long as 3 months for cysts which are 6 to 8 cm.<sup>(22)</sup> Other studies have reported spontaneous regression of cysts larger than 10 cm, and indicate that functional cysts, contrary to general assumption, may grow to a large size.<sup>(23, 24)</sup> Surgical excision is preferable in patients with cysts larger than 10 cm. However, if the cysts are unilocular and in the absence of torsion or suspected malignant disease, a brief observation period may be all that is

needed.<sup>(17)</sup> The use of oral contraceptives is no longer recommended for distinguishing between functional and neoplastic ovarian cysts in menstruating patients. Administration of oral contraceptives to induce cysts regression is no more effective than an observation period with no hormonal therapy.<sup>(17)</sup> Rodman and Korman reported most cysts (90%) smaller than 5 cm are functional in origin.<sup>(25)</sup> In our study, 96% (47/49) of functional cysts are  $\leq$  5 cm and no functional cyst is larger than 6 cm. With a significant difference as shown in table 4, the mean size of functional cyst is 3.10 cm (range 2-6 cm), whereas the mean size of neoplastic cysts is 4.36 cm, range 2-20 cm.

Schutter et al. reported an adnexal mass suspected to be ovary in postmenopausal patients. An ovarian origin could be confirmed in only 78%.<sup>(26, 27)</sup> Rulin and Preston reported the incidence of functional cysts to be about 10% and the other 90% were of neoplastic origin.<sup>(28)</sup> Based on patient age, the incidence of malignant disease was 25% in the group 50 to 60 years old and about 60% in the group older than 80 years of age.<sup>(29)</sup> In our study, although 93.6 % of all masses are ovarian origin (table 3), there are only 5 postmenopausal cases. Three of 5 cases are ovarian origin, 1 case had no any mass (spontaneous regression of functional cyst), 1 case had endometrioma and the last one had serous cystadenoma. It might because small number of cases and only suspected benign adnexal masses were evaluated. Thus, expectant observation in postmenopausal patients is not recommended, an early surgical excision is advisable.

Unilocular cystic tumors of all size are, as a rule, benign. In one study, the incidence of malignant involvement was 2% for cysts larger than 10 cm, whereas all cysts smaller than 10 cm were histologically benign. Thick septa, solid area, irregularities of the inner wall, poorly defined margins and ascites are sonographic findings suggestive of malignant cysts. Solid component, an almost constant feature of ovarian malignant lesion, was noted in 93% of patients with malignant ovarian cysts.<sup>(30)</sup> However, only one malignant cyst was found in our study, endometrioid

carcinoma arising in right unilocular endometriotic cyst. Surprisingly, this malignant case was one of 4 cases of clinically suspected chronic PID and was intra-operatively diagnosed to be severe pelvic endometriosis with 11 cm in diameter of right unilocular endometriotic cyst. After reviewed, she was ever admitted 2 times with misdiagnosis of tubo-ovarian abscess and had good responses of standard medical treatment. Finally, diagnostic laparoscopy was performed because of no regression of a unilocular cyst by ultrasonographic finding after 1-month follow-up with suspected pelvic endometriosis by clinical picture. Because she was 22 years old and single, laparoscopic right ovarian cystectomy, lysis adhesion and coagulation of endometriotic spots were performed and followed by chemotherapy after 2 weeks of pathologic report.

Overall accuracy for detection of ovarian malignant disease did not differ significantly among pelvic examination (76%), ultrasonographic findings (74%) and CA-125 level (77%).<sup>(26)</sup> Findings were similar in a study of 2623 healthy women, in which the specificity of the pelvic examination for malignant disease was 99.9%.<sup>31</sup> When pelvic examination, ultrasonogram and CA-125 determination show no evidence of malignant disease, the positive predictive value for benignity was 100%. If only CA-125 yielded abnormal result but pelvic examination and ultrasonogram show no evidence of malignant disease, the high possibility of benignity still existed.<sup>(26)</sup> A single CA-125 measurement is not helpful in distinguishing between benign and malignant pelvic masses because the positive predictive value is low (10%). When CA-125 is available, this measurement should be used in conjunction with the clinical and ultrasonographic findings to determine whether an ovarian cyst is malignant.<sup>(16)</sup> In this study, because patients' financial problem is a major reason, CA-125 was not determined.

In conclusion, diagnostic laparoscopy to confirm the diagnosis and further management can be performed in the same setting, with low rate morbidity

and short hospital stay. Laparoscopic management of suspected benign adnexal mass is technically feasible. In developing countries where CA-125 is not usually available, benign finding from history taking, pelvic examination and ultrasonogram seem to be adequate for diagnosis of benign adnexal mass. To avoid unnecessary laparoscopic surgery and problem of presecution in this group, we suggest that expectant management for 3 months of apparently benign ovarian tumor does not seem to cause significant risks for the patients and may allow spontaneous regression in about one third of cases. Although laparoscopy is an microinvasive surgery, re-evaluation of the patient just prior to surgery is a must.

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