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Functional Ovarian Cysts: a Multicenter Study of the Current Management Among Iranian Patients

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Abstract

Introduction: Ovarian cysts occur in 30% of females with regular menses, 50% of females with irregular menses and 6% of postmenopausal females.
Aims: In the present study we aimed to compare the actual practice with optimal practice in management of F.O.C. The aim of this study is to find out how many functional ovarian cysts are removed in studied gynecologic departments with the current practice.
Methods and Material: In a multi-centric study histopathology of benign ovarian involvements of patients coming to 20 hospitals were reviewed from 1998 to 2005. Age, sonographic findings and histopathology were recorded.
Statistical analysis used: Analysis was done using SPSS software (Version 13, SPSS Inc., Chicago, Illinois, USA). Statistical analysis of the results were recorded as frequency, (mean + SD) and median (range).
Results: In 2981 patients with benign ovarian histopathology undergoing surgery, 1732 (58.5%) had functional ovarian cysts. Among patients with functional ovarian cyst, 1005 (58%) were uncomplicated, followed by 686 patients (39.6%) having hemorrhagic and 41 patients (2.3%) having torsed ovarian cyst.
Conclusions: Our finding suggests more functional ovarian cysts might have avoided surgery, if more strict criteria for surgery were followed in gynecological departments.

Keywords: **Ovarian Cysts; Ultrasonography**

Key Messages: **More functional ovarian cysts might avoid surgery, if a more strict criteria for surgery including the presence of characteristic *acute pain of torsion and unstable hemodynamic state due to* hemoperitoneum are followed in gynecological departments.**

1. Introduction

Ovarian cysts occur in 30% and 50% of females with regular and irregular menses respectively as well as 6% of postmenopausal females.(1) The rate of hospitalization for functional ovarian cysts (F.O.C.) has been estimated to be as high as 500 admissions per 100 000 women in the United States.(2) Most ovarian cysts among women of reproductive age are physiological (Functional), consisting of either follicular cysts or cystic corpus luteum.(3)

The majority of corpus luteum cysts remain small and asymptomatic with an average diameter of less than 5 cm.(4) The thin- walled capillaries invade the granulosa cells, and then the spontaneous bleeding fills the central cavity of the maturing corpus luteum with blood. This happenes two to 3 days after ovulation In most cases this blood is absorbed from the central cavity to form a cystic space but when excessive hemorrhage happens, it overcomes the body's ability to absorb the blood, thus the cystic space continues to grow.(4) Sometimes these cysts become very large and cause discomfort as they enlarge.(4) In some cases the intra- cystic pressure exceeds the capacity of the cyst's thin walls to contain the bloodwhich leads to cyst rupture, potentially causing significant intraperitoneal hemorrhage.(4) Rupture may cause acute pain, but bleeding is typically self-limited.(5) For practical purposes, F.O.C. should be at least 3 cm (some define it 2-3 cm) with echo free level in sonography.(6)

In the present study we aimed to compare the actual practice with optimal practice in management of F.O.C. and to find out what percentage of functional ovarian cysts are removed in studied gynecologic departments with the current practice.

2. Subjects and Methods

Ovarian histopathology files of 20 tertiary and secondary care hospitals, included in a multi-centric study from 1998 to 2005, were reviewed. Seventeen out of 20 hospitals were in Tehran and the other 3 in Hamadan province located in the west part of Iran. Eighteen hospitals were academic and two non-academic, but under university coverage.

All patients had been operated and at least one ovary or ovarian cyst was resected. Benign ovarian histopathologies were reviewed and all functional ovarian cysts, either complicated (hemorrhagic or torsed) or non- complicated entered the study. Demographic data for patients and sonographic finding (mass size, echo- pattern, free peritoneal fluid) as well as the type of complications, if they existed, were recorded.

Analysis was done using SPSS software (Version 13, SPSS Inc., Chicago, Illinois, USA).

Statistical findings were demonstrated as frequency, (mean + SD) and median (range).

3. Results

The mean age of patients with F.O.C. in the present study was 36 years. Among 2961 benign ovarian histopathology files, 1732 (58.5%) functional ovarian cysts, complicated or non-complicated, were included in the study.

Among 1732 functional cysts, 1005 (58%) were simple uncomplicated functional cyst, 686 (39.6%) were hemorrhagic functional cyst and 41 (2.3%) were adnexal torsion with functional cyst. The mean size of F.O.C. in our study for all patients was 5.7 cm.

The mean age, mean cyst diameter, echo pattern and free peritoneal fluid information of the three mentioned subgroups of functional cysts are represented in Table 1.

4. Discussion

The mean age of F.O.C. in the present study was 36 years. Complicated F.O.C. was present in younger patients (mean age 30 for hemorrhagic and 25 for torsed cysts). Similar mean age for F.O.C. have been reported in other studies to be 34.5 years to 38 years (7, 8) (Table 2).

The mean size of F.O.C. in our study was 5.7 cm which was similar to other studies (Table 2).(8-10) Follicular cysts (the most common form of F.O.C.) are rarely larger than 8-10 cm.(5, 11)

The echo- pattern of F.O.C. in the present study was mostly cystic (94%). Solid pattern in 10.5% of hemorrhagic cysts may be due to blood echo (Table 1).(12) Follicular cysts are typically reported in other studies to be thin walled, unilocular and simple.(5, 10)

In our study, free peritoneal fluid was present in 27% of hemorrhagic and 26% of torsed F.O.C.s (Table 1). If hemorrhage in cyst is large or a cyst ruptures, hemoperitoneum is induced, rarely resulting in hypovolemia and hemodynamic instability.(13) In torsed F.O.C. peritoneal fluid may be due to extravasation caused mainly by venous congestion.

Functional ovarian cyst is common in premenopausal women and in most instances is self-limiting.(6, 14) The management of ovarian masses should be both reasonable and safe, and aim to relieve symptoms, identify those cysts which are likely to resolve spontaneously and then choosing those patients who need surgery because of neoplastic origin or urgent clinical symptoms, taking into account strict sonographic criteria to exclude benign ovarian cysts.(1, 9, 15-25) So the management of a simple cyst may be medical, surgical or expectant.(8) Initial management of a suspected follicular or hemorrhagic cyst is supportive management and continued observation with a repeat pelvic ultrasound in 4 to 6 weeks to document resolution.(13)The indications for immediate operative intervention includes a large amount of peritoneal fluid found on a ultrasound exam, homodynamic instability, and sever pain.(13)

In the present study 58.5% of benign ovarian surgeries was due to F.O.C. compared to other studies which have reported it to be from 9% to 32% (Table 3).(7, 8, 18, 26-31)

The proportion of F.O.C. in our operated ovarian masses (58.5%) in comparison to 9-26% in most studies and 32% in a study from India (Lahore), seems to be high and indicates the need for a cause analysis.

In a study in Lyon, France on 297 surgical operations, 34 (11.4%) cases of F.O.C. was found. They found that 21 out of 34 F.O.C. cases underwent an unnecessary operative and anaesthetic risk because their cyst was suspected to be organic, when it was in fact functional.(7)

In the present study out of 1732 patients *(Table 1)*, finally confirmed to be functional, 1005 had uncomplicated F.O.C. In these group 94% fulfilled sonographic pattern of a 5 cm simple cyst. Some of these patients might have avoided surgery if more restrict rules were used to candidate a patient for surgery. In 686 hemorrhagic cysts, just in 27% there was free fluid (blood) in their sonography.

It is logical in clinical practice to follow 2 main and infrequent indications for surgery in simple ovarian cysts which are severe pain indicating torsion and homodynamic instability due to severe bleeding and large hemoperitoneum. Prescription of analgesia for pain management, which is a common and physiologic sign in corpus luteum cyst, and ruling out of torsion, would significantly reduce the number of unnecessary operations for F.O.C.

Our findings suggest more functional ovarian cysts might have avoided surgery, if more strict criteria for surgery including the presence of characteristic acute pain of torsion and unstable hemodynamic state due to hemoperitoneum, are followed in gynecological departments.

TABLE 1. Age and Sonographic Findings of Uncomplicated, Hemorrhagic and Torsed Functional Ovarian Cysts

Functional Ovarian Cysts	Frequency	Age		Cyst size (cm)		Echo-pattern		Free Peritoneal Fluid
		Mean	Median	Mean	Median	Solid	Cysts	
Uncomplicated	1005 (58)	36 (± 12)	36 (13-79)	5.7 (± 3.2)	5 (15-50)	60 (6)	945 (94)	109 (10.8)
Hemorrhagic	686 (39.6)	30 (± 10)	28 (13-79)	5.8 (± 2.5)	5.5 (2-20)	72 (10.5)	614 (89.5)	186 (27)
Torsed	41 (2.3)	25 (± 8)	25 (13-46)	7.9 (± 2.7)	7.9 (2.1-15)	3 (7.3)	38 (92.7)	11 (26.8)

***Sums are Presented as Mean (± SD), Median (Range) and Frequency: n (%)**

TABLE 2. Age and Cyst Size of Functional Ovarian Cysts in Different Studies

Studies	Number	Age		Cyst Size	
		Mean	Med	Mean	Med
Present study	1005	36 (± 12)	36 (13-79)	5.7 (± 3.2)	5 (15-50)
Study A[a]	200	38	(15-84)	5.8	(3-18)
Study B[b]	34	34.5	(18-76)		
Study C[c]	29		(16-48)		(3-7.5)

* **Sums are Presented as Mean (± SD), Median (Range)**

[a] Reference 7

[b] Reference 8

[c] Reference 6

TABLE 3. Proportion of F.O.C. from Total Benign Ovarian Cysts Operated in Different Studies

Study	Total Number	Frequency of F.O.C. N (%)
Present study	2961	1732 (58.5)
Study A [a]	59	5 (9)
Study B[b]	297	34 (11.4)

Study C[c]	443	89 (20)
Study D [d]	70	7 (10)
Study E [e]	80	26 (32)

[a] Reference 7
[b] Reference 8
[c] Reference 9
[d] Reference 28
[e] Reference 29

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