



## Original Article

## Suitable timing of surgical intervention for ruptured ovarian endometrioma



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## ABSTRACT

**Objective:** Patients with a rare rupture of endometriomas may require surgery. In this retrospective study, we assessed the outcomes of surgical interventions for ruptured ovarian endometriomas.

**Materials and methods:** Forty-three patients who underwent surgical intervention for ruptured ovarian endometriomas were studied. Depending on the latency to surgery and endometrioma recurrence, patients were divided into two groups, and then compared with respect to patient profiles, intraoperative findings, and outcomes.

**Results:** Thirty-one of the 43 patients had a known ovarian endometrioma with an average diameter of 6.04 cm. Seventeen (39.5%) patients had a recurrent ovarian tumor during the postoperative follow up. Patients who underwent surgery within 72 hours or after 72 hours showed no difference in baseline characteristics and most clinical outcomes, except for the choice of surgery ( $p = 0.003$ ) and future fertility ( $p = 0.005$ ).

**Conclusion:** Comprehensive and early surgical intervention after endometrioma rupture can assist in excluding ovarian malignancy and can reduce the effects of cyst fluids, prevent adhesions, and preserve fertility.

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### Introduction

A pelvic mass, defined as a space-occupying lesion within the pelvis [1], can be symptomatic or an incidental finding. Most ovarian cysts are discovered incidentally, but are associated with a 4% admission rate in women who have had an ovarian cyst by the age of 65 years [2]. Major serious events associated with ovarian cysts are ovarian cyst rupture, hemorrhage, and torsion. Endometriosis, a common gynecologic diagnosis, affects approximately 5–12% of women in their reproductive years and has a higher incidence in infertile individuals [3,4]. When patients experience rupture of an endometrioma, which is relatively rare, they experience clinical presentations similar to those associated with rupture of other cysts, including sudden-onset abdominal pain, nausea, and vomiting, followed by severe peritonitis and systemic disturbances

[2,5–11]. Physical or pelvic examination and sonographic evaluation assist in making a correct diagnosis. Serum CA-125, a tumor marker used to distinguish endometriomas from malignancies, has been reported at extremely high levels in patients with endometriomas, which mimics ovarian cancer and often confuses clinicians [9–11]. Cyst ruptures are often managed expectantly with analgesia and observation [2]. Disregarding the effects of residual endometriotic fluid in the pelvic cavity induce further adhesions and enhance the growth of endometriomas [12–15]. Therefore, surgery may be necessary in patients with a ruptured ovarian endometrioma. In this paper, we present our surgical approaches for patients who experienced rupture of ovarian endometriomas, and we discuss the suitable timing of such surgical interventions.

### Materials and methods

The study was conducted at Chang Gung Memorial Hospital (Taipei, Taiwan). When an ovarian cyst was suspected, the patient's general data such as age, body mass index, obstetric data, previous history of pelvic surgery or infertility, and characteristics of menstrual cycles were reviewed in detail. When dysmenorrhea was

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reported, we quantified the pain experienced with a visual analog scale (VAS) that ranged from 0 (no pain) to 10 (intolerable pain). All patients underwent a sonographic evaluation to confirm our impression. For patients with prior sexual experience, we also performed pelvic examinations. Obtaining the serum tumor CA-125 level and performing computed tomography scanning were also indicated when malignancy was suspected or could not be excluded based on the current survey.

After completing the survey, we discussed the clinical condition with the patient and explained the choices of conservative and surgical management. Preoperative evaluations were performed, which included a complete blood count test, chest X-ray, and echocardiography. The surgical approach (e.g., laparoscopy or laparotomy) was selected, based on the patient's condition and clinical presentation and the experience of the operator. Operative charts detailed the operative methods, timing, size, location of the ovarian tumor, and blood loss. The revised American Fertility Society score and adhesion score were used to evaluate the severity of pelvic endometriosis. All removed specimens were sent for pathologic analysis. Patients were discharged under a stable postoperative status and a regular postoperative clinic follow up was recommended.

Patients returned to our hospital every 3–6 months; they underwent a gynecologic examination, sonography, and CA-125 level monitoring. A symptom review was also performed. Pain intensity was self-reported with a VAS pain score. Ovarian endometrioma recurrence was defined as the presence of an ovarian cyst that was characterized by a round, homogenous, hypochoic, low-level echocyst detected by ultrasonography. If the cyst was indistinguishable from other ovarian cysts such as a corpus luteum, endometrioma recurrence was diagnosed only when the cyst persisted after successive menstrual cycles. A further surgical procedure was performed in patients with recurrent symptomatic ovarian endometriomas.

In this retrospective study, we included data from all patients who visited our clinics between January 1988 and December 2009 with acute abdominal pain and who underwent conventional surgical interventions with pathologic confirmation of ruptured ovarian endometriomas. The study was approved by the institutional review board (99-1071B) of Chang Gung Memorial Hospital (Taipei, Taiwan). Depending on the latency to the operation and recurrence of ovarian endometrioma, patients were divided into two groups. The patient profiles, intraoperative findings, and outcomes during follow up were compared.

Data were analyzed using the SPSS PC software package, version 15.0 (SPSS, Inc., Chicago, IL, USA). The independent-samples *t* test was used for comparing continuous variables. The Pearson's Chi-square test was used for comparing categorical data such as previous history of pelvic surgery, the necessity for a further surgical procedure, and pregnancy. A value of  $p < 0.05$  was considered statistically significant.

## Results

Forty-three patients were included in this study; they had a mean age of 30.21 years. Thirty-one patients had a known ovarian endometrioma with an average diameter of 6.04 cm (diameter range, 3.4–12 cm). They reported experiencing abdominal pain with a pain score of more than 6 on approximately day 16 of their cycle (range, day 10–23) (Fig. 1). The tumor was markedly smaller after rupture. Twenty-nine patients underwent surgical intervention within 72 hours of endometrioma rupture, whereas 14 patients underwent surgery after 72 hours. During the postoperative follow up, 17 (39.5%) patients had recurrent ovarian endometriomas and the average latency of

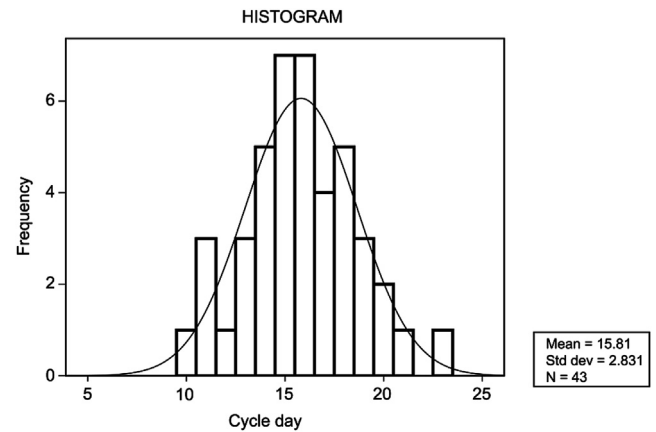


Fig. 1. Histogram of cycle day of pain attack. Std dev = standard deviation.

the recurrence-free period was approximately 54 months (range, 4–261 months). Table 1 lists the demographic data of these two patient groups.

There were no significant differences in baseline characteristics between patients who underwent surgery within 72 hours after rupture and patients who underwent surgery more than 72 hours after rupture. However, the choice of surgical approach differed significantly between the two groups. Among the patients who underwent surgical intervention within 72 hours, 13 patients underwent laparotomy and 16 patients underwent laparoscopic surgical intervention. By contrast, among those patients who underwent surgical intervention more than 72 hours after rupture, 1 patient underwent laparotomy and 13 patients underwent laparoscopy ( $p = 0.003$ ). During follow up, the two patient groups showed no significant differences in latency to recurrence, recurrence rate, and pain score. Among the patients who underwent surgery within 72 hours, 27 patients tried to conceive after the operation, and 7 of 20 patients became

Table 1  
Patient profiles.

Age, y ( $n = 43$ )	30.21 ± 6.35
BMI	20.01 ± 2.65
Obstetric data	
Nulligravid	23 (53.5)
Multigravid	20 (46.5)
Previously known ovarian tumor	31 (81.6)
Size in diameter (cm)	6.04 ± 2.06 (range, 3.4–12)
Location	
Unilateral	35 (92.1) <sup>a</sup>
Bilateral	3 (7.9)
Previous history of pelvic surgery	16 (37.2)
Pain score at onset (0–10)	6.26 ± 1.75
Cycle day of attack	15.81 ± 2.83 (range, 10–23)
Residual ovarian tumor detected at ER (cm)	5.76 ± 2.29
Preoperative serum CA-125 (IU/mL)	278.48 ± 639.35
Latency to surgery	
Less than 72 h	29 (67.4)
More than 72 h	14 (32.6)
OP methods	
Laparotomy	14 (32.6)
Laparoscopy	29 (67.4)
Follow-up	
Recurrence	17 (39.5)
Latency of recurrence-free period (mo)	54.30 ± 57.04 (range, 4–261)

BMI = body mass index; ER = emergency room; OP = operative. Data are presented as number (%) or mean ± standard deviation.

<sup>a</sup> Right, 22; left, 13.

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