

MANAGEMENT OF OVARIAN CYSTS BY LAPAROSCOPIC EXTRACORPOREAL APPROACH USING SINGLE ANCILLARY TROCAR

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SUMMARY

Objective: This prospective study aimed to evaluate an alternative laparoscopic extracorporeal approach for the treatment of benign ovarian cysts.

Materials and Methods: The initial study population included 243 patients diagnosed with benign ovarian masses. Two patients with suspected malignancies and 21 patients with technical difficulties secondary to severe, dense pelvic adhesions were excluded from the study, and the final study population, therefore, comprised 220 patients. A primary 10-mm trocar was inserted, followed by a second incision on the side of the cyst and the introduction of an ancillary 5-mm trocar. The cystic content was aspirated using a needle. The capsule was held using an endograsper inserted through the ancillary trocar. The capsule was extracted from the abdomen. The 5-mm trocar and the endograsper were removed from the abdomen simultaneously. The capsule was completely detached. Homeostasis was performed and the ovary was then released.

Results: The mean duration of the operation was 20 ± 5 minutes. The size of the cysts ranged from 5 cm to 15 cm (mean, 8.4 ± 2.6 cm). The pathologies of the cysts were simple cyst in 86 cases, endometrioma in 68, serous cyst in 57, mucinous cyst in eight and borderline in one. The perioperative complication rate was 2.27%.

Conclusion: This technique does not require the use of two or more ancillary trocars or widening of the trocar incision. The duration of surgery can be shortened considerably and complete excision of the cystic capsule can be performed. Homeostasis was achieved using 3-0 polyglactin sutures. No electrocoagulation was required. [Taiwan J Obstet Gynecol 2009;48(4):380-384]

Key Words: laparoscopy, ovarian cystectomy, single ancillary trocar

Introduction

The indications for operative laparoscopy have increased, and all the operations previously performed by laparotomy can now be achieved using laparoscopy [1]. Compared with laparotomy, laparoscopy provides significant benefits for both patients and surgeons. Total operative trauma is significantly reduced by laparoscopy, and patients have fewer major wounds and fewer

adhesive complications, faster convalescence, and a faster return to social activities [2]. For all these reasons, laparoscopy is frequently preferred for the treatment of ovarian cysts, especially when the nature of the cysts is believed to be benign. Methods for improving the safety and practicality of laparoscopy are, therefore, of significant interest.

There are a limited number of reports on the use of the laparoscopic extracorporeal technique in the literature, and these involved the use of open laparoscopy. In this study, we report on a technique for the laparoscopic treatment of ovarian cysts. This technique does not require two or more ancillary trocars or widening of the incision. The duration of surgery is short and complete excision of the cystic capsule can be performed.



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Materials and Methods

The study was carried out between June 2006 and December 2008 on 243 patients admitted to the Department of Obstetrics and Gynecology, Meram Medicine Faculty, Selcuk University. They all had leading complaints of pelvic or back pain, menstrual irregularity or infertility, and had been diagnosed with ovarian cysts, with a probable initial diagnosis of benign ovarian lesions. The study was approved by the institutional ethics committee. All patients signed informed consent before the operation.

Patients with ultrasonographic images suggestive of malignancy (solid component, ascites and irregular contours) and high serum CA 125 levels (>500 U/mL) supporting the ultrasonographic malignancy criteria were excluded from the study. Patients with body mass indices >35 were also excluded. Diagnosis was confirmed by magnetic resonance imaging in selected cases. Patients with simple cysts <6 cm in diameter were followed up for 3–6 months, and persistence of the cysts was considered an indication for surgery. Patients with severe symptoms relating to the mass (most frequently pelvic pain) and patients with persistent cysts (>6 months' duration) were selected for laparoscopic surgery.

Laparotomy was performed in patients who were suspected of having malignant lesions or dermoid cysts, or when the appearance of the cyst during the operation was suspicious of malignancy (e.g. solid component, ascites, irregular contours and severe adhesions, without presence of endometriosis). Patients identified during surgery with endometriosis of stage II or higher, or patients with dense pelvic adhesions that prevented the entire ovary from being easily detached from the cul-de-sac or side wall, were operated on using two or more ancillary trocars or laparotomy. These patients were excluded from the study.

Operative technique

Patients were prepared in a supine position on the operating table. The abdomen was cleaned with iodine solution. During laparoscopy, a primary 10-mm trocar was inserted directly through a 1-cm subumbilical incision. The laparoscope was inserted through this trocar after insufflation of the abdominal cavity with 3–4 L of CO₂. A second incision was performed in the avascular lower quadrant of the abdomen on the side of the cystic lesion and an ancillary 5-mm trocar was inserted through this incision for management of the cyst (Figure 1). The cystic content was aspirated using a needle inserted via this ancillary trocar and the needle was then removed. The cystic capsule was then held using an endograsper

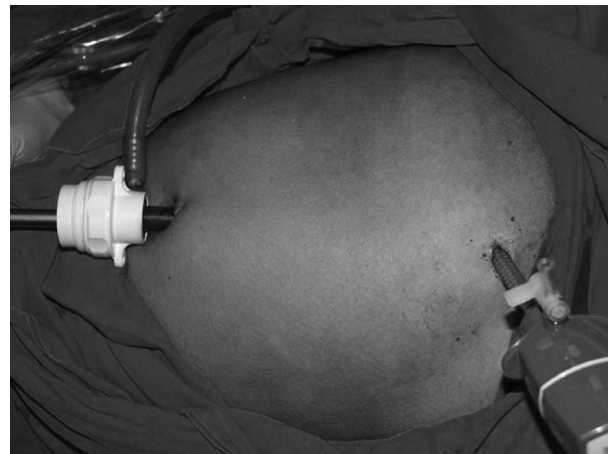


Figure 1. View of abdominal wall where 10-mm and 5-mm trocars were inserted.

inserted through the same ancillary trocar, and the capsule was extracted from the abdomen with the help of the endograsper. At the same time, the 5-mm trocar and endograsper were both removed from the abdomen (Figure 2). The cystic capsule was thus removed from the abdomen while keeping the normal ovarian tissue within the peritoneal cavity (Figure 3). The cyst capsule was completely detached from the adjacent ovarian tissue, taking care to ensure that complete excision of the cyst was achieved (Figure 4). Homeostasis of the adjacent ovarian tissue was performed outside the abdomen using 3-0 polyglactin suture (Vicryl; Ethicon Inc., Somerville, NJ, USA) and the ovary was then released from the endograsper into the abdominal cavity. The pelvic cavity was washed with physiological saline solution. If the cyst was ruptured during surgery, the pelvic cavity was washed twice with physiological saline and a semi-flexible drain tube was inserted through the trocar incision. The drain tube was removed before the patient was discharged. Final homeostasis of the operative field and the trocar site were performed under direct vision of the laparoscope. Gas was released from the primary trocar and the trocar finally removed. A single cutaneous suture was performed using 3-0 polypropylene (Prolene; Ethicon Inc.) at each trocar site. Patients were followed up in hospital for 24 hours after surgery and then discharged.

Results

Laparotomy was performed in two patients in whom the appearance of the cyst during surgery was suspicious of malignancy. A further 21 patients with dense pelvic adhesions were operated on using two or more ancillary trocars or laparotomy. Twelve of these had endometriosis of stage II or higher, while the remaining nine patients

had adhesions due to previous operations. The above patients were excluded from the study. Thus, a total of 220 patients were included for analysis.

The mean age of the patients was 30.2 ± 5.4 years. The major complaints of the patients before diagnosis were pelvic pain, infertility, persistent cysts, menstrual irregularities, back pain, constipation, and frequent

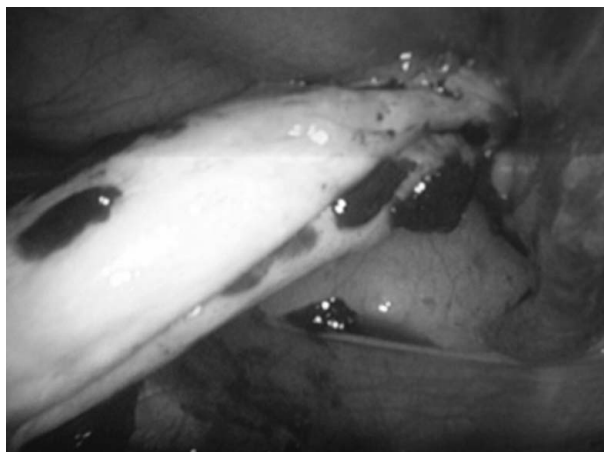


Figure 2. Cyst capsule is extracted from the abdomen.



Figure 3. Cyst capsule is taken out of the abdomen.

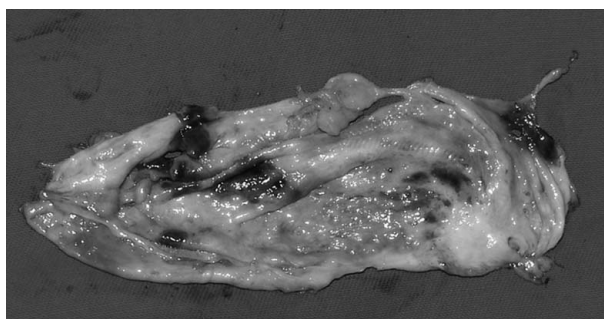


Figure 4. Cyst capsule is completely detached from the adjacent ovarian tissue.

micturition. The most common indication for laparoscopy was pelvic pain ($n=95$, 43.1%). The size of the cysts ranged from 5 cm to 15 cm (mean, 8.4 ± 2.6 cm). The mean body mass index of the study population was 24.6 ± 4.2 (range, 19.2–31.4). The mean duration of the operation was 20 ± 5 minutes. The pathologies of the cysts were simple cyst in 86 cases (39.1%), endometrioma in 68 (30.9%), serous cyst in 57 (25.9%), mucinous cyst in eight (3.6%) and borderline in one (0.5%). The results are summarized in Tables 1 and 2.

The operative complications included three cases of trocar site bleeding and two cases of subcutaneous emphysema. No complications related to the bowel or bladder were detected (Table 3). During the postoperative follow-up at 3 and 6 months after the operation, six recurrences were detected in patients who had endometriomas before surgery. No endometriosis relapse of the abdominal wall was noticed. All patients were satisfied with the operation.

Table 1. Summary of results

Patients, <i>n</i>	220
Age of patients, mean \pm SD (yr)	30.2 ± 5.4
BMI, mean \pm SD*	24.6 ± 4.2
Operation time, mean \pm SD (min)	20 ± 5
Size of the cysts, range (mean \pm SD) (cm)	5–15 (8.4 ± 2.6)
Laparoscopic cystectomy, <i>n</i>	220

*Calculated as weight in kilograms divided by height in meters squared.
BMI = body mass index; SD = standard deviation.

Table 2. Pathology of ovarian cysts ($n=220$)

Pathology	<i>n</i> (%)
Simple cyst	86 (39.1)
Endometrioma	68 (30.9)
Serous cyst adenoma	57 (25.9)
Mucinous cyst adenoma	8 (3.6)
Borderline	1 (0.5)
Malignancy	0

Table 3. Complication of laparoscopic surgery ($n=220$)

Complications	<i>n</i> (%)
Trocar-site bleeding	3 (1.4)
Subcutaneous emphysema	2 (0.9)
Bladder injury	0 (0)
Bowel injury	0 (0)
Total	5 (2.3)

Discussion

Benign ovarian tumors account for 90% of all ovarian tumors. The malignancy incidence is 13% in premenopausal women, compared with 45% in postmenopausal women [1]. Specific clinical findings are helpful for differentiating between malignant and benign neoplasms. Benign lesions are usually unilateral, cystic, mobile and smooth, without ascites, and with a slow growth pattern, and are frequently found in younger age groups [3]. In our study, we differentiated the adnexal masses according to ultrasonographic findings in concordance with serum CA 125 levels, and included all patients believed to have benign ovarian masses. However, if the appearance of the cyst was suspicious of malignancy during the operation, laparotomy was performed.

Physiologic ovarian cysts are the most common type of ovarian masses and may be related to menstrual irregularities. Physiologic ovarian cysts < 6 cm in diameter usually regress. Premenopausal women may be managed conservatively over two menstrual cycles. Oral contraceptives may be offered as an alternative treatment for functional cysts. All ovarian neoplasms > 6 cm or with solid components and those in postmenopausal women require surgical investigation [3]. In this study, we operated on symptomatic persistent ovarian cysts if they resisted treatment or if they persisted for more than 6 months.

Patient age is an important factor in the management of patients with adnexal masses. Most adnexal masses in younger patients are benign. There were no malignant cases in the current study. Surgical intervention for benign adnexal masses is often initiated using a laparoscopic approach, and we, therefore, chose laparoscopy for the management of these patients.

Direct trocar insertion into the abdomen was preferred, because this method may be associated with fewer complications. Molloy et al [4] reported that the direct entry technique was associated with a significantly lower incidence of major injuries (0.5/1,000), when compared with both the open and Verres entry produces (1.1 and 0.9/1,000, respectively; $p=0.0005$).

Wenzl and colleagues [5] reported that the detection of an ovarian malignancy during laparoscopic surgery was rare, occurring in only 0.65% of all endoscopic surgical procedures. No malignancies were detected in our series. The approach to resection of an ovarian cyst should be planned to minimize adhesion formation. The incidence of adhesion formation appears to be lower when the initial approach is through laparoscopy rather than laparotomy [3].

Seltzer [6] addressed some potential pitfalls of the laparoscopic approach to ovarian lesions, including the

potential for increased duration of the surgical procedure and for incomplete resection of ovarian lesions. However, using our method, the mean duration of surgery was approximately 20 minutes, suggesting that this method reduces operation time. Because the cystic capsule was resected from the normal ovarian tissue outside the abdomen, we could be sure that complete resection of the capsule was achieved. Homeostasis of the normal ovarian tissue was also achieved outside the abdomen, under direct vision. No electrocoagulation was performed within the abdominal cavity, thus eliminating the possibility of complications related to cauterization. All the patients were found to be satisfied with the operation scars.

The literature includes few reports on the use of laparoscopic extracorporeal cystectomy. One of these by Chung et al [7] reported the use of open laparoscopy in a limited number of cases. Four obese patients in their second trimester underwent open laparoscopy for treatment of large ovarian cysts. A Cook Ob/Gyn special cyst aspirator with a 14-gauge aspirating needle was inserted into the abdomen to drain the ovary through a separate 10-mm port; the site of insertion depended on the location of the ovary. After the cyst was decompressed, the 10-mm incision was enlarged to 3 cm, and either extracorporeal oophorectomy or cystectomy was performed, and no complications were encountered. Our technique, however, requires no widening of the trocar incision or open laparoscopy.

Ceyhan et al [8] also used a laparoscopic extracorporeal technique for the treatment of ovarian endometriomas in 36 patients, using four ports. Our technique was applied for all types of ovarian cysts, except dermoid cysts and endometriosis of stage II or higher. Our technique required only a single ancillary trocar.

In conclusion, surgeons performing laparoscopic surgery for ovarian cysts usually need to place two or more ancillary trocars. We have demonstrated a practical alternative method in which all operative procedure can be performed through a single ancillary trocar with no need to widen the incision. The duration of the operation is short and complete excision of the cystic capsule can be performed. Homeostasis is achieved outside the abdomen and no electrocoagulation is required. The level of patient satisfaction with the operation scars appears to be excellent.

Acknowledgments

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