SCIENTIFIC PAPER

Laparoscopic Surgical Management and Clinical Characteristics of Ovarian Fibromas

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ABSTRACT

Objective: This study aims to analyze the clinical characteristics and diagnostic features of ovarian fibromas and to evaluate the efficacy and safety of laparoscopic surgery for ovarian fibromas.

Methods: We reviewed the records of 47 consecutive women who underwent laparoscopic or laparotomic surgeries and whose final histopathological diagnoses were ovarian fibroma, cellular fibroma, or fibrothecoma from January 1999 to August 2010.

Results: During the study period, 49 tumors were removed from 47 women including 27 ovarian fibromas, 19 fibrothecomas, and 3 cellular fibromas. The preoperative diagnoses were ovarian fibroma in 25 women (53.2%) and uterine myoma in 16 women (34.0%). A high serum CA 125 level (>35U/mL) was observed in 15 women, and serum CA 125 level was significantly higher in women with ascites (P=<0.001). The tumors were removed surgically in all women, using the laparotomic approach in 16 women (34.0%) and the laparoscopic approach in 31 women (66.0%). The laparoscopic surgery had the advantages of shorter hospital stay and faster return of bowel activities compared to laparotomy.

Conclusions: Ovarian fibromas are often misdiagnosed as uterine myomas, and sometimes mistaken for a malignant tumor of the ovary preoperatively. Laparoscopic surgery can be an effective and safe surgical approach for managing ovarian fibromas.

Key Words: Cellular fibroma, Fibroma, Fibrothecoma, Laparoscopy, Ovary.

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INTRODUCTION

Ovarian fibroma is the most common benign solid tumor of the ovary, which accounts for 1% to 4% of benign ovarian tumors.[1–4] Ovarian fibromas are often difficult to diagnose preoperatively and are commonly misdiagnosed as uterine myomas, because of the solid nature shown in ultrasonographic findings. Ascites is sometimes present, and the serum CA 125 level increases, which may lead to the mistaken diagnosis as a malignant tumor of the ovary.[2,5] The treatment of choice for ovarian fibromas is surgical removal, but the operative approach to managing ovarian fibromas has been discussed infrequently. Surgeons are reluctant to use laparoscopic surgical management, because it can be difficult to safely remove the excised tumors from the abdominal cavity.

We analyzed the clinical characteristics and diagnostic features of ovarian fibromas and evaluated the efficacy and safety of laparoscopic surgery as a treatment for ovarian fibromas by comparing the outcomes of laparoscopic surgery with those of laparotomy.

METHODS

In this study, we retrospectively reviewed the records of 47 consecutive women who underwent laparoscopic or laparotomic surgeries and whose final histopathological diagnoses were ovarian fibroma, cellular fibroma, or fibrothecoma at Kangbuk Samsung Hospital from January 1999 to August 2010. In all women, the initial preoperative evaluation included a medical history, physical examination, pelvic examination, and gynecological ultrasonography. The serum levels of tumor markers (CA125 and CA 19-9) and results of computed tomography (CT) or magnetic resonance imaging (MRI) were checked. We reviewed the clinical charts and analyzed the data on the women's age, parity, body mass index (BMI), previous history of abdominal surgery, symptoms, preoperative diagnosis, ultrasonographic findings, serum levels of tumor markers, diameter of the mass, operative procedures, operating time, method of surgical approaches (laparoscopy or laparotomy), concurrent surgeries, change in hemoglobin concentration from before surgery to postoperative day 1, hospital stay, and complications.

Laparotomy was performed to treat 16 women (laparotomy group) and laparoscopy was used to treat 31 women (laparoscopy group). In our hospital, laparoscopy was not actively conducted before March 2003. So, the laparoscopy group included 28 women who were treated after 2003 and 3 women before 2003. The laparotomy group included 7 women after 2003 who had refused to undergo laparoscopy, and 9 women before 2003. There was no conversion to laparotomy.

For the surgical parameters, the operating time was defined as the time elapsed from the incision of the skin to the closure of the skin in laparotomy and as the time elapsed from the insertion of the first trocar to the closure of the trocar site in laparoscopy. The return of bowel activity was defined as the period from the end of general anesthesia to the first occurrence of bowel gas passage. This study was approved by Kangbuk Samsung Hospital Institutional Review Board.

Statistical Analysis

The data are expressed as the median and range. The data were analyzed using SAS software, version 9.1 (SAS Institute Inc., Cary, NC, USA). Frequency distributions were compared using chi-squared and Fisher's exact tests, and median values were compared using the Student *t* test and Mann-Whitney *U* test. Two-sided P-values <0.05 were considered significant.

RESULTS

During the study period, women underwent surgery for benign ovarian tumors in our hospital, of which 49 ovarian fibromas, including fibromas, fibrothecomas, and cellular fibromas, were diagnosed based on the histopathological results in 47 women (2.0%). The clinical characteristics of these 47 women are summarized in **Table 1**. Ultrasonographic examinations were performed in all women, and CT or MRI was performed in 19 women (40.4%). Ascites was observed in 15 women (31.9%), and the estimated volume of ascites ranged from 50mL to 3500mL. The macroscopic appearance of the tumors observed during the surgery in all women was of a solid nature, with a white or whitish-yellow color and a smooth surface. The preoperative ultrasonographic image and the laparoscopic views of the tumor are shown in **Figure 1**.

The most frequent symptoms were abdominal discomfort and pain (53.2%), followed by no symptoms. Fibroma was detected incidentally in 2 women, and their preoperative diagnoses were carcinoma in situ of the uterine cervix and tubal pregnancy, respectively. Other disorders found along with ovarian fibroma included uterine myomas in 20 women (42.5%), serous cystadenoma of the ipsilateral ovary in 2 women, and mature cystic teratoma of the ipsilateral ovary in 1 woman. Bilaterality was found in 2 women: fibroma and cellular fibroma in each ovary in one woman, and fibroma and fibrothecoma in the other woman. Torsion was observed in 3 women (6.4%), who were all menopausal, and the diameters of the tumors were 15cm, 10cm, and 8cm, respectively.

Table 1.
Clinical Characteristics of the Women

Characteristics	Median (Range)
Age (years)	51 (25–87)
Parity	3 (0–8)
Body mass index (kg/m^2)	22.3 (17.9–32.5)
Serum CA 125 level (U/mL) (n=30)	25.6 (3.1–442.6)
Serum CA 19-9 level (U/mL) (n=26)	17.0 (4.5–145.5)
Associated symptoms n (%)	
Abdominal discomfort or pain	25 (53.2)
Asymptomatic	15 (31.9)
Palpable abdominal mass	6 (12.8)
Dysuria	1 (2.1)
Preoperative diagnosis	
Benign ovarian tumors including ovarian fibroma	25 (53.2)
Uterine myoma	16 (34.0)
Ovarian malignant tumor	4 (8.5)
Carcinoma in situ of the uterine cervix	1 (2.1)
Tubal pregnancy	1 (2.1)
Women with ascites (50–3500mL)	15 (31.9)
Postmenopausal women	23 (48.9)
Location of ovarian fibroma	
Right	30 (63.8)
Left	15 (31.9)
Bilateral	2 (4.2)
Histopathological results (n=47)	
Fibroma	27 (55.1)
Fibrothecoma	19 (38.8)
Cellular fibroma	3 (6.1)

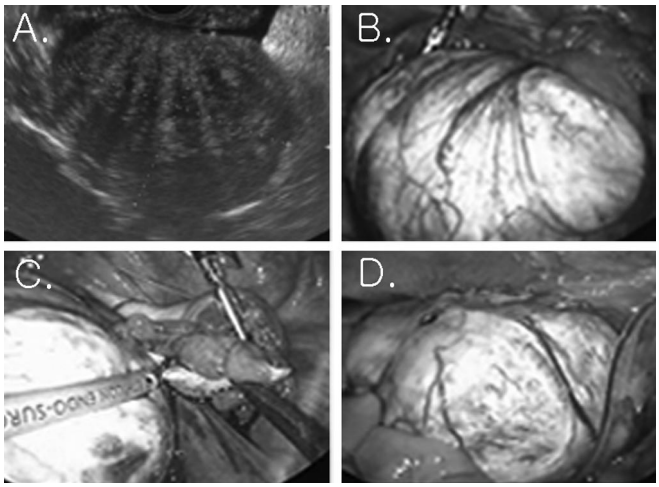

Figure 1. (A) Transvaginal ultrasonographic scan of the fibroma showing the hypoechoic image that cannot be distinguished easily from uterine myoma preoperatively; **(B)** Laparoscopic view shows the right ovarian fibroma with whitish color and smooth surface; **(C)** The tumor is being resected away from the right ovary using a Harmonic shears; **(D)** We are putting the resected fibroma into an endobag. The tumor can be safely removed by using an endobag.

Thirty-one women underwent laparoscopic surgery, and 16 underwent laparotomy. The comparative results of both operative approaches are summarized in **Table 2**. Shorter hospital stay and faster return of bowel activity were observed in the laparoscopy group.

Preoperative serum CA 125 level was measured in 32 women, and of those, both serum CA 125 and CA 19-9 levels were measured in 28 women. Serum CA 125 level was high (>35U/mL) in 15 women, and serum CA 19-9 level was high (>37U/mL) in 3 women. As shown in **Table 3**, the number of women with high serum CA 125 level was significantly higher in women with ascites ($P<0.001$).

DISCUSSION

Ovarian fibromas, which belong to the group of sex cord-stromal cell tumors, are the most common benign solid tumor of the ovary. In almost all cases, they are benign and curable by surgical excision. These tumors occur generally in older women. In our study, 80.9% of the women were older than 40 years of age, and 49.0% of the women were menopausal. Two women (4.3%) had bilateral tumors, and other studies have reported an incidence of bilateral tumors of 0% to 11.76%.[1–3] In our study, the tumor was found more often on the right side, which is different from the previous results that reported the higher incidence on the left side.[2,3]

Ovarian fibromas are often difficult to diagnose before surgery. There are no characteristic symptoms and the ultrasonographic findings cannot easily distinguish ovarian fibromas from uterine myomas having. In this study, 16 women (34.0%) were misdiagnosed preoperatively as uterine myoma. Leung et al[3] reported that 34.7% of women were misdiagnosed preoperatively as having uterine myoma, and only 21.7% were diagnosed accurately as having ovarian fibroma.

In our study, 15 (31.9%) of the women had ascites. Other studies have found ascites in up to 67% of women when including small amounts of ascites found during surgery. The relationship between fibroma and ascites is explained by observations showing that the cortex layer of the ovary, which is the origin of the fibroma, does not have lymph vessels, so the tumor itself forms a transudate.[6] Ascites disappears after the surgical removal of the tumor.[7] In our women, high serum CA 125 level was related significantly to the presence of ascites **(Table 3)**, which is consistent with other study results showing a relationship between increased serum CA 125 level and ascites.[5,7,8] However, further studies are needed to determine whether the high serum CA 125 level is related directly to ovarian fibroma or to the accompanying ascites.

Microscopically, ovarian fibromas are solid tumors comprising spindly fibroblastic cells.[4,6,9] Fibrothecomas include lipid-laden theca cells, which form thecomas, in addition to the cells that form fibromas, and this terminology is used when the distinction between these 2 forms is not clear.[9] Cellular fibroma, which is a rare form of ovarian fibroma, can also occur. A tumor comprising cells with closely packed nuclei with absent or minimal nuclear atypia and 1 to 3 mitoses/10 high-power fields is classified as cellular fibroma.[10] A tumor showing moderate nuclear atypia and >3 mitoses/10 high-power fields has a malignant potential and is designated as a fibrosarcoma.

Surgery is the recommended treatment for ovarian fibroma. Salpingo-oophorectomy can be considered in perimenopausal or postmenopausal women, and cystectomy only can be performed in young women.

Our comparative analysis of the outcomes between the laparoscopy group and the laparotomy group showed that laparoscopic surgery has the advantages of shorter hospital stay and faster return of bowel activities. The other characteristics were not significantly different be-

Table 2.
Characteristics and Operative Procedures

Characteristics	Laparoscopy Group [n=31; Median (range)]	Laparotomy Group [n=16; Median (range)]	P Value
Age (years)	49 (25–82)	54 (26–87)	0.229[b]
Parity	3 (0–8)	2.5 (0–8)	0.631[b]
Body mass index (kg/m^2)	21.9 (17.9–32.5)	22.7 (18.1–26.5)	0.753[b]
Operating time (minutes)	90 (25–240)	100 (55–125)	0.529[b]
Hospital stay (days)	3 (2–10)	7 (4–11)	<0.001[b]
Diameter of mass (cm)	7 (2–20)	8 (2.5–30)	0.072[b]
Hemoglobin change (g/dL)	1.5 (0.3–3.7)	1.5 (0.4–5.3)	0.958[b]
Return of bowel activity (h)	29 (18–38)	34.9 (23–72)	0.006[b]
Procedures[a]			0.295[c]
Hysterectomy + BSO	8	11	
Hysterectomy + USO	7	0	
Hysterectomy + OC	1	0	
USO	10	3	
OC	5	0	
USO + OC	0	1	
Oophorectomy	0	1	
Complications			
Transfusion	1	1	0.621[c]

[a]BSO=bilateral salpingo-oophorectomy, USO=unilateral salpingo-oophorectomy, OC=ovarian cystectomy.
[b]Mann-Whitney *U* test.
[c]linear-by-linear association.

Table 3.
Serum CA 125 Levels According to the Presence or Absence of Ascites in Women With Fibroma, Fibrothecoma, or Cellular Fibroma

	Ascites Absent	Ascites Present	Total	P Value
Elevated serum CA 125	2	13	15	<0.001[a]
Normal serum CA 125	15	2	17	

[a]Fisher's exact test.

tween groups. As mentioned earlier, the accurate preoperative diagnosis of an ovarian fibroma is not easy, and the tumor is not often diagnosed accurately until during the surgery. With the advances in operative instruments and techniques, laparoscopic surgery has become more popular, and it is being used frequently by many gynecologists. It is possible to encounter ovarian fibromas incidentally during the laparoscopy, which is of concern because an ovarian fibroma has a solid nature and is difficult to remove from the abdominal cavity. We safely removed the tumor using an endobag by exposing the opening of the endobag to the outside of the abdominal cavity through the 12-mm trocar site and morcellating the tumor with ovum forceps without allowing them to spill into the abdominal cavity. When performing laparoscopically assisted vaginal hysterectomy, the tumor can be removed safely by putting it in an endobag and removing the endobag through the vagina after hysterectomy. This is possible because a fibroma is not as solid as a uterine myoma and can be morcellated into pieces easily when pulled by forceps.

CONCLUSION

Ovarian fibromas are uncommon but are the most common benign solid tumor of the ovary. Gynecologists should be aware of this type of tumor because of the difficulties in diagnosis. This tumor is often misdiagnosed as a uterine myoma in ultrasonographic findings and is sometimes mistaken for a malignant tumor of the ovary, because of its solid nature, increased tumor marker levels, and accompanying ascites. However, ovarian fibromas are benign and can be treated completely by surgical removal, and laparoscopic surgery can be an effective and safe alternative approach.

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