

The Impact of Laparoscopic Surgery in the Management of Adnexal Masses

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Abstract

The objective of this study is to evaluate the clinical aspects of laparoscopic management of adnexal masses. The feasibility of this approach has been demonstrated, but the safe and effective use of laparoscopy for this indication requires training, technical skills and experience on the part of the laparoscopist. If used appropriately, many patients will benefit from minimally-invasive surgery.

We compared clinical factors of patients having laparoscopy to those having laparotomy in a case-control study of 30 patients with adnexal masses. Oophorectomy or ovarian cystectomy was performed by laparoscopy for 20 women and by laparotomy for 10 women. Comparing the 2 groups, the most significant difference was the decrease in length of hospital stay in the laparoscopy group. There were no significant differences in operative time or intraoperative complications. Estimated blood loss was lower in the laparoscopy group, and no intraoperative complications occurred. No patient required conversion from laparoscopy to laparotomy. All patients had benign disease despite the inclusion of patients with risk factors for ovarian carcinoma.

This study clearly demonstrates the clinical benefits of laparoscopic management of adnexal masses treated with oophorectomy or ovarian cystectomy.

Key Words: Laparoscopy, adnexectomy, ovarian carcinoma.

Introduction

Advances in laparoscopy have allowed physicians to perform procedures previously accomplished only by laparotomy. Gynecologists have utilized laparoscopy for many years in the performance of tubal ligation, evaluation of pelvic pain, and treatment of adnexal cysts. General surgeons now commonly perform laparoscopic procedures including cholecystectomy and appendectomy, and are increasing the number of indications for which it can be utilized. The use of laparoscopy by gynecologic oncologists also promises less invasive techniques for treatment of cancer. Endometrial cancer can now be managed by laparoscopic-assisted vaginal hysterectomy and laparoscopic lymph node sampling. Early-stage ovarian cancer may be staged laparoscopically, and cervical cancer can be managed with laparoscopic pelvic and aortic lymphadenectomy and radical vaginal hysterectomy.

Several studies have demonstrated the feasibility of operative laparoscopy in the treatment of adnexal masses (1–4). The same surgical principles that apply in laparotomy must apply to laparoscopy. Given the possibility of encountering malignant adnexal masses, careful preoperative consideration must be used. Preoperative counseling must include the possibility of laparotomy and staging procedures if a malignancy is diagnosed on frozen section. Cytologic washings must be collected at the initiation of the procedure. The pelvis as well as upper abdomen must be visualized and described. Techniques to prevent spillage of cyst contents include use of laparoscopic endobags and aspiration of large cysts using the endoscopic cyst aspirator set. All adnexa must be sent for frozen section histologic evaluation to allow for immediate management of malignancies. Strict application of these guidelines will lead to uncompromised treatment of patients with ovarian cancer, and patients will reap the benefits of laparoscopic surgery.

Clinical benefits of the laparoscopic approach have included decreased morbidity, improved cosmetic results with smaller incisions, and faster return to normal activity. It is our goal to objectively demonstrate clinical benefits and therapeutic efficacy using a case-control study of laparoscopy compared to laparotomy in the management of adnexal masses.

Materials and Methods

We identified two 12-month academic years, July 1, 1990 – June 30, 1991 and July 1, 1993 – June 30, 1994, separated by a 24-month period during which we analyzed all cases involving operative laparoscopy or laparotomy for resection of adnexal pathology by oophorectomy (with or without salpingectomy) or ovarian cystectomy. All surgery was performed by 3 gynecologic oncologists at the Mount Sinai Hospital in New York. A database of all patients admitted to the service was compiled from three independent sources of admission data: (1) computerized hospital records of patient admissions and discharges indexed by attending physician and by service, (2) divisional databases, and (3) fellow case logs. Data was extracted from the above-mentioned sources including: age, menopausal status, preoperative diagnoses, pathology reports, surgical procedure, complications, intraoperative blood loss, operative time, number of prior operative procedures, length of hospital stay, occurrence of postoperative nausea and requirements for postoperative pain medication. Statistical analysis utilized Student's t test.

Results

The case group consisted of 20 patients who underwent laparoscopy. The control group consisted of 10 patients who underwent laparotomy. All patients had an admitting diagnosis of adnexal mass.

Preoperative assessment included: medical history, physical exam, radiographic studies and/or measurement of CA-125 serum marker.

Age range in the laparoscopy group was 22–72 years, with a mean of 52 (± 14) years, the majority being postmenopausal. The laparotomy group ages ranged from 17–76 years with a mean of 37 (± 17) years, with all but 2 of the patients being premenopausal. The mean ages of the patients

were significantly in the two groups (p=0.02).

The preoperative diagnosis for both groups included adnexal mass, either simple or complex, and all patients had benign findings intraoperatively. Pathologic diagnosis included serous cystadenoma (8), dermoid cysts (6), thecomas (4), simple cysts (3), mucinous cystadenomas (2), tubal CIS (1) serous cystadenofibroma (1), Leydig-s cell tumor (1), paratubal cysts (1), ovarian dysplasia (1), hemorrhagic corpora luteal cysts (1), and endometrioma (1). **Table 1** shows the specific procedures performed in each group. The laparotomy group underwent 6 unilateral adnexectomies, 2 bilateral adnexectomies, and 2 ovarian cystectomies. The laparoscopy group underwent 6 unilateral adnexectomies, 12 bilateral adnexectomies, and 2 ovarian cystectomies. No cases required conversion from laparoscopy to laparotomy, and no intraoperative complications occurred.

TABLE 1
Types of Surgery Performed for Management of Adnexal Masses

	Laparoscopy	Laparotomy
Cystectomy	2	2
USO	6	6
BSO	12	2
Total	20	10

USO = unilateral salpingo-oophorectomy; BSO = bilateral salpingo-oophorectomy.

TABLE 2
Comparison of Clinical Aspects Between Laparoscopy and Laparotomy Groups

	Laparoscopy mean ± SD	Laparotomy mean ± SD	p-value
Age (years)	52 ± 14	37 ± 17	0.02
Estimated blood loss (mL)	41 ± 27	118 ± 48	0.0005
Operative time (minutes)	107 ± 58	85 ± 33	0.2
Length of stay (days)	1.2	6	<0.0001

Comparisons between the 2 groups for selected clinical characteristics are shown in **Table 2**. Estimated blood loss ranged from 75–200 cc in the laparotomy group with a mean of 118 (±48 cc), and 10–100 cc in the laparoscopy group with a mean of 41 (±27) cc; this difference is significant with p=0.0005. Operative time ranged from 36–140 minutes in the laparotomy group with a mean of 85 (±33) minutes, and 40–251 minutes in the laparoscopy groups with a mean of 107 (±58) minutes. This difference is not significant (p=0.2).

The size of the masses approached with laparoscopy was variable, the largest being 13 x 9 x 3 cm, a benign cystic teratoma which was morselated and removed in endobags. The smallest was a benign ovarian cyst measuring 2 x 2 x 2 cm. The average volume was 69 cm³ and 274 cm³ in the laparoscopy and laparotomy groups, respectively (data not shown).

All patients received parenteral narcotics postoperatively for pain control in the laparotomy group. Patients in the laparoscopy group rarely required parenteral narcotics in the postoperative period; in fact, most required only oral analgesics. We recorded the incidence and timing of postoperative nausea in the laparoscopy group and found only 2 patients with significant complaints, one of whom required overnight observation due to her symptoms. The second patient had a history of significant nausea and vomiting during a prior procedure, but despite the use of droperidol and metoclopramide in the perioperative period, she had nausea and vomiting within the first 8 hours following surgery.

Length of stay was the most significant difference found between the 2 groups. Average hospital stay was 1.2 days for the laparoscopy group, as compared to the laparotomy group, whose average stay was 6 days ($p < 0.0001$). The study cases were collected when laparoscopy was first initiated. With experience, we have realized that hospital admission for postoperative care is rarely necessary and currently the majority of patients with laparoscopic adnexectomies are discharged from the recovery room 4–6 hours postoperatively. Although we did not document time to full recovery, the data that were available suggest that women treated with laparoscopy returned to normal and productive activity more quickly.

Discussion

Laparoscopy is widely used in gynecologic practice. This study supports other studies showing that innovative use of advanced operative laparoscopic techniques accomplishes equal or improved therapeutic results with less morbidity than standard surgical procedures. With liberal use of ultrasonography, an increased number of patients, both reproductive and postmenopausal, are being referred to gynecologic oncologists. These women will benefit from the use of laparoscopy when managed by a well-trained and experienced surgeon.

The use of operative laparoscopy to perform adnexectomies is feasible, yet its use in managing postmenopausal patients and potentially malignant masses has been less accepted (5–8). Some fear suboptimal treatment and spill of malignant cells in the presence of an ovarian carcinoma. Treating postmenopausal patients with bilateral adnexectomy alone has also been criticized because standard therapy has included hysterectomy in the presence of a benign ovarian mass (9). With informed consent this may be unnecessary, as most adnexal masses in postmenopausal women are benign and the rate of subsequent malignancy in the remaining organs is low.

In this study of 30 patients, we did not exclude women with a family history of ovarian cancer, elevated CA-125, or features suggestive of malignancy on radiologic studies. Despite the referral bias of a gynecologic oncology practice, no patient was found to have malignant disease. Nevertheless, all patients were approached with an index of suspicion.

Washings were collected with a suction irrigator at the beginning of all procedures. The pelvis, upper abdomen, and diaphragm surfaces were clearly visualized. All masses were approached with care to prevent spillage by the use of laparoscopic endobags. In the event of cystic masses too large to fit into an endobag, the endoscopic-cyst aspirator was used to puncture and drain

the cyst without spillage, decompressed, and the specimen placed directly into an endobag for removal. We have found this to be a very successful approach to large cystic masses. The use of endobags also prevents contact of the mass with the abdominal incision, thereby decreasing the risk of tumor seeding along the trocar tract. Once the adnexa or cyst was removed, it was sent immediately for frozen section. Had a malignancy been found, it could be addressed at that time with staging via laparotomy, or by laparoscopic staging. All patients signed consents for possible laparotomy and staging procedures; therefore, in the event of a malignancy there would be no delay in therapy.

The results of this study demonstrate several clinical benefits of laparoscopy. Although estimated blood loss was small in both groups, there was a significant decrease in the laparoscopy group, likely due to the lack of a large abdominal incision. Operative times were not significantly different. Of note, most laparotomies involved unilateral adnexectomies, whereas the laparoscopy groups had mostly bilateral adnexectomies given their postmenopausal status. Therefore, the laparoscopy group had equivalent operative times despite the higher frequency of bilateral adnexectomies. As the operating room staff and surgeons become more experienced, the operative time for laparoscopy may be even shorter than for laparotomy. Postoperative pain control in the laparoscopy group consisted mostly of oral analgesics, whereas the laparotomy group invariably required parenteral narcotics. In addition, the postoperative recovery period was much shorter for the laparoscopy group. Currently, patients undergoing laparoscopic adnexectomies are discharged from the recovery room on a same-day basis. Patients also benefit from more rapid return to normal activity and a better cosmetic result with only small incisions. In this study, there were no negative effects of laparoscopy, no need for conversion to laparotomy, and no significant complications or resulting inadequate treatment.

Since the time when we collected these cases for study, we have encountered 5 cases of early-stage ovarian carcinoma during laparoscopic oophorectomy and completed laparoscopic staging with laparoscopic assisted vaginal hysterectomy, bilateral salpingo-oophorectomy, omentectomy, and bilateral pelvic and aortic lymphadenectomy. The operative assessment was complete with excellent visualization of the upper abdomen and diaphragmatic surfaces, and complete pathologic specimens were obtained. Several groups have also reported the feasibility of successful staging of Stage I and II ovarian carcinoma (10–12).

The ability to use laparoscopy as a tool in managing adnexal masses allows early treatment that is therapeutically sound and offers the clear benefits of decreased hospital stay, decreased cost, and earlier return to normal activities.

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