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Laparoscopic Cytoreduction for Primary Advanced Ovarian Cancer

James Fanning, DO, Rod Hojat, MD, Jil Johnson, DO, Bradford Fenton, MD, PhD

ABSTRACT

Introduction: We evaluated the feasibility of laparoscopic cytoreduction for primary advanced ovarian cancer.

Methods: All patients with presumed stage 3/4 primary ovarian cancer underwent attempted laparoscopic cytoreduction. All patients had CT evidence of omental metastasis and ascites. A 5-port (5-mm) transperitoneal approach was used. A bilateral salpingo-oophorectomy, supracervical hysterectomy, and omentectomy were performed with PlasmaKinetic (PK) cutting forceps. A laparoscopic 5-mm Argon-Beam Coagulator was used to coagulate tumor in the pelvis, abdominal peritoneum, intestinal mesentery, and diaphragm.

Results: Nine of 11 cases (82%) were successfully debulked laparoscopically without conversion to laparotomy. Median operative time was 2.5 hours, and median blood loss was 275 mL. All tumors were debulked to <2 cm and 45% had no residual disease. Stages were 1–3B, 7–3C, and 1–4. Median length of stay was one day. Median VAS pain score was 4 (discomforting). Two of 11 patients (18%) had postoperative complications.

Conclusion: Laparoscopic cytoreduction was successful and resulted in minimal morbidity. Because of our small sample size, additional studies are needed.

Key Words: Ovarian cancer, Cytoreduction, Salpingo-oophorectomy, Supracervical hysterectomy, Omentectomy.

INTRODUCTION

Advanced laparoscopic procedures are increasingly being utilized as an alternative to laparotomy in gynecologic surgery.[1–3] A meta-analysis of 27 prospective randomized trials has proven the benefits of laparoscopic compared with abdominal gynecologic surgery: decreased pain, decreased surgical-site infections (decreased relative risk 80%), decreased hospital stay (2 days less), quicker return to activity (2 weeks sooner), and fewer postoperative adhesions (decreased 60%).[4]

Advanced laparoscopic procedures are also increasingly being utilized as an alternative to laparotomy in gynecologic oncology surgery. Laparoscopic-assisted vaginal hysterectomy (LAVH) with lymphadenectomy has become a standard treatment for endometrial cancer.[5] Laparoscopic and robotic radical hysterectomy is becoming more widely utilized for the treatment of cervical cancer.[1] Laparoscopic staging of early ovarian cancer and laparoscopic secondary cytoreductive surgery for recurrent ovarian cancer has been described.[3]

We have previously reported on the feasibility of the Maylard transverse incision compared with the standard midline incision for cytoreductive surgery in primary advanced ovarian cancer in an attempt to decrease morbidity, ie, decreased postoperative pain, hernia rate, adhesions, and pulmonary complications.[6] Morbidity can be further reduced by using laparoscopic surgery. Following our laparoscopic success with endometrial cancer staging, robotic radical hysterectomy,[1] LAVH for leiomyoma >1000 g,[2] and laparoscopic secondary cytoreduction for recurrent ovarian cancer,[3] we investigated laparoscopic cytoreduction for primary stage 3/4 ovarian cancer.

The purpose of this study was to evaluate the feasibility of laparoscopic cytoreduction for primary advanced ovarian cancer.

MATERIALS AND METHODS

Over a 1-year period, all patients with presumed stage 3/4 primary ovarian cancer underwent attempted laparoscopic cytoreduction. All patients had evidence of omental metastasis and ascites on CT scan. No patients were

Summa Health System, Northeastern Ohio Universities College of Medicine, Akron, Ohio (all authors).

Address correspondence to: James Fanning, DO, Professor Division of Gynecologic Oncology, Summa Health System, Northeastern Ohio Universities College of Medicine, 75 Arch St, Suite 101, Akron, OH 44304, USA. Telephone: (330) 762-0954, Fax: (330) 252-0115, E-mail: Fanningj@summa-health.org

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excluded. Patients with microscopic abdominal metastasis (stage 3A) and microscopic nodal metastasis were not included because cytoreduction was not required. All patients were operated on by a single gynecologic oncologist and were identified retrospectively through his surgical log. Institutional review board approval was obtained.

All patients received a preoperative bowel prep with 45 mL of fleets phosphosoda orally, a single dose of preoperative prophylactic antibiotics and external pneumatic cuffs.

All procedures were performed with the patient under general endotracheal anesthesia. An orogastric tube was inserted and removed at the end of surgery. The patient was positioned in the dorsolithotomy position with legs in Allen stirrups, and placed in a maximal Trendelenburg position (≈ 30°). A gel pad was placed under the buttocks to prevent the patient from gravitating towards the head of the table. A 5-port (5-mm) transperitoneal approach was used. A 5-mm trocar was inserted in the left upper quadrant and ascites was aspirated. Four additional 5-mm ports were placed: periumbilical, right and left lower quadrant, and right upper quadrant. Round ligaments were excised with PlasmaKinetic (PK) cutting forceps (Gyrus ACMI, Southborough, MA). Retroperitoneal spaces were dissected, both ureters were identified, and the infundibulopelvic ligaments were excised with the PK cutting forceps. The anterior and posterior leaf of the broad ligament was dissected, and the bladder was dissected off the cervix with monopolar electrosurgery. Uterine vessels and cardinal and uterosacral ligaments were then coagulated and cut with the PK cutting forceps. A supracervical hysterectomy was completed by excising the upper endocervix with the PK cutting forceps. The Trendelenburg position was discontinued, and the omentum was retracted toward the pelvis via graspers through the lower quadrant ports. The lateral attachments of the infracolic omentum were excised with the PK cutting forceps. If the omental metastasis was not densely adherent to the transverse colon, the entire omentectomy was performed with the PK cutting forceps. A 6-cm periumbilical Maylard incision was performed and the omentum, uterus, and ovaries were manually delivered. When adherent omental metastasis was present, the omentum was delivered through the incision, and the remainder of the omentectomy was performed by a traditional approach. The transverse colon was delivered through the incision, inspected, and oversewn as necessary. Large ovarian masses were decompressed at the abdominal incision to assist extraction. The periumbilical Maylard incision was closed with a running mass closure with a delayed absorbable monofilament suture. A laparoscopic 5-mm Argon-Beam Coagulator (ABC, ValleyLab, Boulder, CO) was used to coagulate residual tumor in the pelvis, abdominal peritoneum, intestinal mesentery, and diaphragm. The ABC was used at a setting of 50 watts to 70 watts and an argon gas flow setting at 4 L per minute.

On postoperative day 1, patients were given bowel stimulation with 30mL of milk of magnesia, started on a general diet, and were discharged when fluid intake was adequate. Patients were followed up in the office weekly following surgery until chemotherapy was initiated. Chemotherapy consisted of carboplatin and Taxol IV q21 days for 6 cycles.

RESULTS

Median age was 60 years old (range, 51 to 77), and median BMI was 25 kg/m^2 (range, 18 to 32). Nine of the 11 patients (91%) had medical comorbidities, and 8 of 11 patients (73%) had prior abdominal surgery.

Nine of 11 cases (82%) were successfully debulked laparoscopically without conversion to laparotomy. Median operative time was 2.5 hours (range, 2.2 to 3.5), and median blood loss was 275 mL (range, 15 to 800). Median ovarian size was 5 cm (range, 2 to 16), and median omental metastasis was 14 cm (range, 3 to 40). All tumors were debulked to <2 mL, and 45% had no residual disease. Stage was 1–3B, 7–3C, and 1–4. Median length of stay was 1 day (range, 1 to 7). Median postoperative VAS pain score (range, 0 to 8) was 4 (discomforting). Two of 11 patients (18%) had postoperative complications. One patient developed acute tubular necrosis that resolved spontaneously on postoperative day 3. A second patient developed pneumonia and required a 7-day hospital stay.

Two cases could not be completed laparoscopically and were converted to laparotomy. The first patient in this series had extensive omental metastasis. All of the remaining patients with large omental metastasis were successfully completed laparoscopically. The second patient had bulky metastasis surrounding the rectosigmoid.

Ca125 normalized after a median of 3 cycles of chemotherapy (range, 1 to 3). At a median follow-up of 1 year (range, 0.5 to 1.9), all patients are alive with no evidence of disease. One patient recurred at 1.2 yr and underwent laparoscopic secondary debulking and chemotherapy and is presently disease free.

DISCUSSION

In a PubMed search, we were unable to locate any prior trials on laparoscopic cytoreduction for primary stage 3/4 ovarian cancer. Krivak et al[7] reported on hand-assisted laparoscopy; however, only 6 of 25 patients had advanced cancer and only 3 of the 6 (50%) were successfully debulked. We have previously reported on laparoscopic secondary cytoreductive surgery for recurrent ovarian cancer.[3] Of 36 patients, 94% were successfully debulked laparoscopically. Since recurrence was discovered because of Ca125 elevation, most recurrent tumors were <2 cm and thus less bulky than our present series. Laparoscopy has also been used in advanced ovarian cancer to predict the chance of optimal cytoreduction at laparotomy[8] and for second-look evaluation after laparotomy cytoreduction and chemotherapy.[9]

Although we were unable to locate any prior trials on laparoscopic cytoreduction for primary advanced ovarian cancer, we can compare our results with the results of our previous study on Maylard laparotomy cytoreduction. Of 31 patients with primary advanced ovarian cancer cytoreduced via a Maylard laparotomy, cytoreduction to <2 cm residual disease was similar to that of our present series, but operative time was 28% longer, length of stay was 4 times longer, and postoperative complications were increased 61%. Also, it is interesting to compare our results with "ultraradical" laparotomy cytoreduction. Eisenkop et al,[10] a major proponent of ultraradical laparotomy cytoreduction, reported on 408 patients with primary stage 3C ovarian cancer who underwent laparotomy cytoreduction. In this series, cytoreduction to no residual disease was almost double our rate (86% vs 45%). However, morbidity was significantly increased: operative time was increased 20%, blood loss was tripled, length of stay was 10 times longer, and postoperative complications were significantly increased, including a 3% mortality.

Of the multiple benefits of laparoscopic surgery, fewer postoperative adhesions (decreased 60%)[4] may be especially beneficial for primary advanced ovarian cancer. Following cytoreduction and platinum/Taxol chemotherapy for primary advanced ovarian cancer, 80% of patients will go into remission. However, 75% of these tumors will recur. Frequently, secondary cytoreduction is performed at the time of recurrence.[3,6] Fewer postoperative adhesions following primary laparoscopic cytoreduction may allow secondary cytoreduction to be performed more safely and successfully.

CONCLUSION

We present the original series of laparoscopic cytoreduction for primary advanced ovarian cancer. Laparoscopic cytoreduction was successful (82%) and resulted in minimum morbidity (1-day hospital stay, minimal pain, 18% complications). Because of our small sample size, additional studies are needed. If additional studies confirm our results, prospective randomized controlled trials are needed to compare laparoscopic and open cytoreduction for primary stage 3/4 ovarian cancer to compare success, morbidity, and survival.

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