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Original Article

Comparison of single-port and three-port laparoscopic salpingectomy in the management for tubal pregnancy

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Abstract

Background: To compare the short-term outcome of patients undergoing single-port laparoscopic salpingectomy (SP-LS) and conventional three-port laparoscopic salpingectomy (C-LS).
Methods: A retrospective evaluation of 112 patients with tubal pregnancies treated by one surgeon at a single teaching hospital. Among these, 47 patients were treated with SP-LS and the remaining 65 were treated with C-LS.
Results: The characteristics of patients were similar in both groups. There were no statistically significant differences in operative time, estimated blood loss, intraoperative and immediate postoperative complications, and length of hospital stay between both groups. Time to bowel recanalization (6.2 ± 1.0 vs. 7.2 ± 1.4 h, $p < 0.05$) and postoperative visual analog scale for pain scores (3.0 ± 0.5 vs. 3.6 ± 0.6, $p < 0.005$) were significantly lower in the SP-LS group compared with those in the C-LS group.
Conclusion: Our study demonstrated the feasibility to use the single-port laparoscopic salpingectomy in the management of women with tubal pregnancy, which showed the similar or better outcome compared with the use of conventional three-port laparoscopic salpingectomy.

Keywords: Laparoscopy; Salpingectomy; Single-port; Tubal pregnancy

1. Introduction

Compared with laparotomy, laparoscopy − a minimally invasive surgery, is associated with less subjectively reported postoperative pain, rapid postoperative recovery, shorter hospital stay, and better cosmetic results.[1−5] Nearly all benign gynecological diseases can be performed by laparoscopic surgery.[2−4]

Ectopic pregnancy is one of the most common emergencies occurred in women during the reproductive age.[6,7] Women with ectopic pregnancies can be managed by medical, surgical or combination of both therapies successfully.[8−10] Besides systemic medical treatment with methotrexate, laparoscopic surgery is a treatment of choice in the management of tubal ectopic pregnancies.[11] Laparoscopic surgery included

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laparoscopic salpingotomy and laparoscopic salpingectomy.[11] Results from the European Surgery in Ectopic Pregnancy (ESEP) study suggested that salpingectomy could be considered in the management of women with tubal ectopic pregnancy who have a healthy contralateral tube, based on the findings of no cost-effectiveness and no significant improvement of future fertility in women with tubal pregnancy who received salpingotomy.[12,13]

Conventional laparoscopic surgery can be finished either by one, two or three ancillary trocars.[1–4] Recently, innovations in technology have allowed laparoscopic surgeons to perform the surgery through single-incision approach.[14–16] One of the most important advances is a development of the multi-channel single-port devices.[14–16] For tubal pregnancy, Ghezzi is a pioneer who used one trocar laparoscopy in the management of tubal pregnancies.[17] However, it is not really a single wound, because Dr. Ghezzi had an additional wound, located approximately 3 cm above the symphysis in the midline.[17] This accessory wound is for the purpose to insert a straight hand needle for surgery.[17] So far, only a few reports discussed the feasibility of single-port laparoscopy in the management of tubal pregnancies.[18–22] No reports have been found in Taiwan. The following study was attempted to compare the outcome of women with tubal pregnancies treated either with single-port laparoscopic salpingectomy (SP-LS) or with conventional three-port laparoscopic salpingectomy (C-LS).

2. Methods

2.1. Study population

This retrospective cohort study was designed to evaluate short-term outcome of women with tubal pregnancy performed by one operator (Dr. Sun) between March 2011 and December 2015. Approval for the study was obtained from the hospital's ethics committee. A total of 131 patients diagnosed for tubal pregnancy during the study period were reviewed. Exclusion criteria included the followings: (1) initial treatment by medical treatment; (2) initial treatment by exploratory laparotomy; (3) initial treatment by organ-sparing surgery, such as salpingotomy, local injection of medicine (methotrexate, or etoposide); and (4) absence of pathological diagnosis. Finally, 112 women were analyzed, including 47 women treated with SP-LS and the remaining 65 with C-LS (Fig. 1).

2.2. Surgical technique

All patients were under general anesthesia with endotracheal tube intubation, and placed in the dorsal lithotomy position with a Foley and a uterine manipulator. The operator stood on the left side of the patient. In the SP-LS group, a 2.0-cm transverse umbilical skin incision, and 3.0-cm fasciotomy was done to open the peritoneal cavity and Alexis small wound retractor (Applied Medical, Rancho Santa Margarita, CA, USA) was inserted (Fig. 2). The wrist portion of a sized 6.5 surgical glove was fixed to the outer ring of the wound retractor and three-channel single port instruments were set up (Fig. 3). The pneumoperitoneum was inflated to 16 mmHg and 5 mm 30-degree scope was used. In the C-LS, three port wounds were established, including one port wound on the umbilicus area, and the second on left upper quadrant area, and the third on the suprapubic area.

The estimated blood loss was calculated after cleaning the hemoperitoneum resulted from tubal pregnancies. Salpingectomy was performed with a bipolar electrosurgical instrument. The specimen was extracted from the umbilical wound. The umbilical fascia and subcutaneous tissue were closed.

2.3. Outcome measurements

The collection of the patient data included age, obstetrics history, operative time, amount of intra-abdominal bleeding, time to flatus, final pathology, estimated blood loss, postoperative pain score, and postoperative analgesic use. Time to flatus, which indicates resumption of normal bowel function as expressed by the presence of bowel sounds and the passage of flatus was recorded by on-duty nurse and verified by the one of the authors (Dr. Sun). Postoperative pain control was provided with meperidine hydrochloride intramuscularly every 4 h as needed within 48 h after operation if the subjects were still during the hospitalization. Nonsteroidal anti-inflammatory drugs were not used within 48 h every 6 h after operation.[23–27] The accumulated dose was calculated as the summation of all used meperidine per patient during the hospitalization. The pain score determined by visual analog pain scale (VAS) applicable to the patients was used to evaluate postoperative pain after the surgery.[23–25] All pain assessments were made at rest and finished by on-duty nurse and verified by the operator (Dr. Sun).

2.4. Statistical analysis

Statistical analysis was performed using SPSS 18.0.0 software (SPSS, Chicago, IL, USA). Descriptive statistics are presented as the means and standard deviation or percentages. A two-tailed $p < 0.05$ was considered significant.

3. Results

Forty-seven women in the SP-LS group (27 and 20 at the right and left side, respectively) and 65 patients in the C-LS group (35 and 30 at the right and left side, respectively) were analyzed.

There were no significant differences of the mean age (35.3 ± 5.9 years for the SP-LS group compared with 36.9 ± 6.0 years for the C-LS group, $p = 0.36$), the mean operating time (30.5 ± 4.6 min for the SP-LS group compared with 31.0 ± 5.8 min for the C-LS group, $p = 0.71$), the amount of hemoperitoneum (125.0 ± 56.9 mL for the SP-LS group compared with 335.0 ± 504.0 mL for the C-LS group, $p = 0.11$), and the analgesic use (0.1 ± 0.3 vial for the SP-LS group compared with 0.2 ± 0.4 vial for the C-LS group, $p = 0.38$). Patients in the SP-LS group had statistically

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