

Laparoscopic Management of Tubal Ectopic Pregnancy

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ABSTRACT

Objectives: To study the surgical morbidity associated with laparoscopic management of tubal ectopic pregnancy compared with that of open laparotomy.

Methods: A retrospective study in an academic tertiary obstetrics and gynecology referral center was conducted from 2005 through 2007. Forty-nine patients who had pathology-confirmed tubal ectopic pregnancies were divided into 2 groups, laparoscopy (n=38) and laparotomy (n=11). The main outcome measures included operative time, blood loss, and complications.

Results: No significant differences existed in gestational age, beta-hCG level, history of previous surgeries, pelvic inflammatory disease, or endometriosis. The laparotomy group included more patients with a history of previous ectopic pregnancy. The length of hospital stay following laparoscopic management was significantly less than that in the laparotomy group.

Conclusion: Laparoscopic management of ectopic pregnancy can be the most beneficial procedure with maximum safety and efficacy.

Key Words: Laparoscopy, Ectopic pregnancy, Laparotomy.

INTRODUCTION

Ectopic pregnancy is a major cause of maternal morbidity and mortality, increasing in incidence worldwide.^{1,2} Ectopic pregnancy is responsible for a significant proportion of maternal mortalities in the United States, comprising about 9% of all such deaths.¹ The accurate diagnosis of ectopic pregnancy can now be made at an early stage by using sensitive pregnancy tests and high-resolution transvaginal ultrasound. This can lead to more options for treating ectopic pregnancy.³

Laparoscopy has been used in the diagnosis of ectopic pregnancy for many years, and is being used with increasing frequency in the surgical treatment of ectopic pregnancy.⁴ Not only is salpingectomy considered a treatment option, but preservation of the fallopian tube is also a treatment option.⁵ However, the laparoscopic approach for most cases of ectopic pregnancy and salpingectomy is preferred over salpingostomy if the contralateral tube is healthy.⁴

The advantage of operative laparoscopy for ectopic pregnancy over laparotomy is well recognized: it is associated with shorter operation times, less intraoperative blood loss, shorter hospital stay, and lower analgesic requirements.^{6,7} Significantly fewer adhesions develop in laparoscopic surgery.⁸ The laparoscopic approach is also associated with significantly lower costs.⁹

However, the presence and amount of hemoperitoneum and the patient's hemodynamic status are two of the most important factors in deciding which kind of operation to perform. The present study was designed to assess the surgical treatment of ectopic pregnancy at a teaching hospital located at eastern Taiwan. We studied the characteristics and outcomes of laparoscopic management of tubal ectopic pregnancy compared with laparotomic management in such patients.

MATERIALS AND METHODS

This study was a retrospective review of all pathology-confirmed tubal ectopic pregnancies surgically treated between January 2005 and December 2007 at our hospital, an academic tertiary referral center. Physicians in the De-

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partment of Obstetrics and Gynecology at Buddhist Tzu Chi General Hospital, Hualien, Tzu Chi University conducted the study.

The following patient characteristics were recorded: age, height, weight, gestational age of ectopic pregnancy, and quantitative beta-hCG level. Conditions that predispose to adhesion formation, including prior surgeries, ectopic pregnancy, history of pelvic inflammatory disease, and endometriosis were recorded. Gravidity and parity were also noted.

Body mass index (BMI) was calculated (in kilograms per square meter). The patients were then divided into 2 groups: those who had laparoscopy (laparoscopy group) and those who had laparotomy (laparotomy group). The amount of internal bleeding and unstable vital signs were the parameters used to determine whether to proceed with most laparotomy cases.

The following outcome information was collected from operative and anesthesia records: estimated blood loss, operative time, operative complications, type of surgery performed, and length of hospital stay. Estimated blood loss was defined as blood loss from the surgery and preexisting blood loss found on entry into the abdomen. Operative time was defined as time between starting and finishing the procedure.

Results are presented as mean \pm standard deviation (SD). Continuous variables were tested using the Student *t* or Mann-Whitney U test, where appropriate. Numerical variables were tested using the chi-square or Fisher's exact test, where appropriate. A 2-tailed $P < 0.05$ was defined as statistically significant. The statistical calculations were performed with SPSS software (SPSS, Inc., Chicago, Illinois).

RESULTS

Forty-nine patients were identified as having pathologically documented tubal ectopic pregnancies that were treated surgically. Laparoscopy was performed in 38 patients and laparotomy in 11.

The general characteristics of the patients and conditions that predispose to adhesion formation, such as previous surgeries, ectopic pregnancy, endometriosis, and pelvic inflammatory disease are shown in **Tables 1 and 2**. No statistical differences were found in patient age, BMI, gestational age, beta-hCG level, or history of previous surgeries, pelvic inflammatory disease, or endometriosis between the 2 groups. A statistical difference did exist in

Table 1.
Patient Characteristics for Both Group 1 and Group 2 Patients

Parameter	Laparoscopy (n = 38)	Laparotomy (n = 11)
BMI*	22.2 \pm 4.5	21.9 \pm 3.0
Age (y)	28.3 \pm 6.3	30.0 \pm 7.9
Parity	0.87 \pm 1.0	1.45 \pm 1.2
Gestational age (wk)	6.0 \pm 1.3	6.5 \pm 0.9
beta-hCG	3082 \pm 5023	5175 \pm 6223

*BMI = body mass index.

Table 2.
Predisposing Factors of the 2 Patient Groups

Characteristics n (%)	Laparoscopy (n = 38)	Laparotomy (n = 11)
Previous surgery	8 (21.0)	5 (45.4)
Previous ectopic pregnancy*	3 (7.8)	5 (45.4)
Previous PID	2 (5.2)	0
History of endometriosis	1 (2.6)	0

PID = pelvic inflammatory disease.
* $P < 0.05$

the history of previous ectopic pregnancy in the laparotomy group.

Table 3 shows the mean of estimated blood loss and operative time between the 2 groups. The length of hospital stay following laparoscopic management was significantly less than the length of stay in the laparotomy group.

DISCUSSION

Ectopic pregnancy remains a common gynecologic condition that causes significant maternal morbidity and mor-

Table 3.
Estimated Blood Loss and Operative Time for the 2 Patient Groups

Parameter	Laparoscopy (n = 38)	Laparotomy (n = 11)
Estimated blood loss (mL)	318.4 \pm 514.7	934.5 \pm 1106.8
Operative time (min)	73.2 \pm 26.8	84.5 \pm 34.3
Length of hospital stay* (day)	2.7 \pm 0.6	3.2 \pm 1.1

* $P < 0.05$.

tality. The incidence of ectopic pregnancy has increased from 0.5% 30 years ago to a current incidence of 1% to 2%.¹⁰ The risk of ectopic pregnancy is increased by several factors: previous ectopic pregnancy, tubal damage from surgery, a history of infertility, treatment using in vitro fertilization, and increased age.⁴ In our study, the laparotomy group had a significantly greater number of patients with a history of previous ectopic pregnancy.

Because laparoscopy has been shown to be superior to laparotomy, it has become the gold standard for the treatment of ectopic pregnancy.³ However, in women who are hemodynamically unstable, the role of laparoscopy remains controversial. But as surgeons gain increased expertise in laparoscopic surgery, even in the presence of a large hemoperitoneum, operative laparoscopy is still achievable.^{11,12} In our study, 11 patients underwent laparotomy due to being hemodynamically unstable. Most of our patients (77.5%) were treated with the laparoscopic approach.

Obesity has an impact on whether laparoscopic surgery can be performed. Obesity, defined as BMI > 30, is considered by some to be a relative contraindication to operative laparoscopy.¹³ Also, laparoscopic surgery in the obese population can be challenging. Increased abdominal wall thickness makes it difficult to achieve pneumoperitoneum and to visualize the inferior epigastric vessels. Moreover, increased omental and retroperitoneal fat limits maneuverability of the instruments.¹⁴ However, a recent report¹⁵ reveals that laparoscopic management of tubal ectopic pregnancy does not appear to significantly increase surgical morbidity in obese patients. In our study, BMI was not significantly different between the 2 groups.

The mean operative time was shorter in the laparoscopic group. This may contradict the results of many studies documenting the unpredictability of time needed for laparoscopic surgery, especially for ectopic pregnancy.¹⁶ Blood loss was less and hospital stay was shorter in the laparoscopy group. Previous randomized studies^{6,17} also have shown that laparoscopy results in less blood loss, a shorter hospital stay, and lower cost compared with laparotomy.

CONCLUSION

A higher percentage of ectopic pregnancies can be managed laparoscopically if minimal access experience is introduced in the surgical unit. Although this study is limited by its retrospective nature, it supports the idea that laparoscopic management of ectopic pregnancy might be the

most beneficial procedure with maximal safety and efficacy.

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