

A Comparison of Laparoscopic Surgery and Laparotomy in the Treatment of Ectopic Pregnancy

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ABSTRACT

Objectives: To compare the laparoscopic approach with laparotomy in the treatment of ectopic pregnancy. The aim of this study was to evaluate the efficiency of laparoscopic surgery for ectopic pregnancies in China.

Method: A retrospective analysis involving 142 patients with ectopic pregnancies was done. Seventy-two of the 142 patients were treated laparoscopically.

Results: In the laparoscopic group, the operating time and post-hospital stay were significantly shorter but the total cost was higher compared with the laparotomy group.

Conclusion: Although the laparoscopic surgery for ectopic pregnancies is a new approach and it is not widely practiced in China; it has more advantages than open surgery and it has been well accepted by the surgeons and patients. It is a safe and feasible approach, but the rate of laparoscopic approach for ectopic pregnancy is still low in China when compared with the developed countries.

Keywords: laparoscopic surgery, ectopic pregnancy

INTRODUCTION

Ectopic pregnancy (EP) was the main cause of death in half of the pregnancy cases studied^(1,2). Although the mortality from EP has declined in recent years, the incidence of EP in the world continues to rise steadily⁽³⁾. The combined use of serum β -hCG radioimmunoassay, transvaginal ultrasound scan and diagnostic laparoscopy have made the early detection of EP possible⁽⁴⁾. Currently, the majority of surgery for EP in China is done through laparotomy and laparoscopic surgery has recently been introduced for the management of EPs in the big cities of China.

MATERIALS AND METHODS

A retrospective analysis involving a total of 142 patients with EP admitted between April 1995 and March 1996 to the Xin Hua Hospital was studied.

The initial diagnosis of EP was made through a combination of clinical examination, β -hCG assay and transvaginal ultrasonography. All patients suspected to have an EP underwent a diagnostic

laparoscopy. The patients with hemoperitoneum were treated by laparoscopy or laparotomy based upon the haemodynamic status of the patient, experience of the surgeon and the availability of endoscopic equipment. As there were more emergency and tubal rupture cases in the laparotomy group, therefore we did not compare the volume of blood loss. The data of procedure, hospital stay, operating time and total operating cost were noted. Our aim was to assess whether laparoscopic surgery is feasible or not for ectopic pregnancies in China.

The majority (95.83%) of the procedures was performed under continuous epidural anaesthesia unless the patient was in shock.

Laparoscopic procedures were performed in the semilithotomy position. Pneumoperitoneum was established by insufflation via a Veress needle through an intra-umbilical incision, followed by introduction of a 10 mm laparoscope. After a confirmation of the diagnosis and laparoscopic treatment was deemed possible, a 5 mm puncture was made in the left and right lower quadrant using direct visualisation and transillumination to avoid the epigastric vessels. Salpingectomy was performed by step-wise desiccation of the mesosalpinx with bipolar forceps, harmonic scalpel or by ligating vessels with clips and cutting along the mesosalpinx and across the proximal tube using scissors. Diluted vasopressin was injected into the mesosalpinx for precautional haemostasis when performing a salpingotomy. The tubal incision was left open and allowed to heal by secondary intention. Surgical specimens were generally removed through the 10 mm subumbilical trocar sleeve. The pelvis was copiously irrigated with saline at the end of each procedure. Blood loss was estimated by the staff nurse of the operating suite at the end of each case.

Post-operative serial β -hCG levels were noted in those patients who had undergone conservative procedures, ie. salpingotomy. All the patients were followed-up from the time of surgery to the present time.

RESULTS

Of the 142 patients, 72 were treated laparoscopically. The 2 groups treated with either laparoscopy or laparotomy were similar in age distribution (Table I). The distribution of procedures performed

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Table I – Age distribution of the 2 groups of patients

	Age (years)
Laparotomy	33.13 ± 5.43
Laparoscopy	32.53 ± 5.56

p > 0.05

Table II – Distribution of the 2 procedures

	Laparotomy	Laparoscopy
Salpingectomy	63	48
Linear salpingotomy	5	20
Milking	0	2
Partial resection of ovary	2	2
Failure	0	1

is shown in Table II. There was one case of a repeat procedure in the laparoscopy group. The patient was initially treated with a laparoscopy linear salpingotomy but underwent a second open salpingectomy 22 days after the initial surgery, due to progressively rising β -hCG titers. The operating time and post-operative hospital stay was significantly shorter in the laparoscopic group while the total cost for ectopic pregnancy was higher in this group (Table III).

The average time taken for the β -hCG to return to normal (3.1 ng/mL) was 4.33 days after conservative surgery (Fig 1).

DISCUSSION

Laparoscopy has been used in the diagnosis of EP for many years. Since the first excision of a tubal pregnancy through a laparoscope by Shapiro & Adler⁽⁵⁾, it has been used with increasing frequency in the surgical treatment of EPs. Our hospital has

10 years of experience in diagnostic laparoscopy and we have performed more than 2,000 such cases. However, operative laparoscopy had only been introduced in April 1995.

Laparoscopy permits diagnosis and treatment to be combined in the same procedure and EPs can be diagnosed and treated at an early stage. In fact, laparoscopy is not only suitable for early EPs but it is also safe and feasible in instances where there is tubal rupture and hemoperitoneum, provided the patient is not severely compromised haemodynamically^(1,6,7). In our laparoscopic group, the greatest estimated hemoperitoneum was 2,000 mL and the procedure was carried through successfully.

It has always been recognised that laparoscopic surgery requires specialist training because it changes the 3-dimensional laparotomy into 2-dimensional picture on the video monitor. We have shown that laparoscopic techniques do not increase the operating time. In fact, it actually saves time, as during a laparotomy, opening and closing the abdomen just to gain access to the affected tube consumes precious operating time.

We have tried laparoscopic injection of Methotrexate for unruptured EPs before performing operative laparoscopy. We think that it is an easier conservative treatment, but has a higher failure rate compared to salpingotomy^(8,9).

Incomplete trophoblastic removal is one of the complications of conservative tubal pregnancy surgery. In our series, one patient out of 20 laparoscopic salpingotomy was re-admitted because of increasing levels of β -hCG after initial laparoscopic salpingotomy. It is important to follow-up on all the patients as the level of β -hCG may remain elevated for up to 30 days following conservative surgery. This appears to be dependent on the initial levels^(10,11). At our hospital, the patients were followed-up with a combination of urinary β -hCG test and serum β -hCG assay, because the laboratory report of serum β -hCG levels were only available several days later.

The fertility rates after laparoscopic salpingotomy appeared to be favorable when compared to salpingectomy⁽⁹⁾. As there is the “one child” policy in China, the majority of our patients did not want to risk having future pregnancies, so the data of fertility rates after surgery were not collected. Although they did not want a future pregnancy, some of them still preferred the conservative surgery, the reason being they simply wanted to keep the tube. However, the question is, “Does the conservative procedure increase the risk of recurrent ectopic pregnancy?” Some authors say “yes”. In addition, the conservative procedure has a higher failure rate when compared to salpingectomy. So even if the patient does not want to risk having a future pregnancy, laparoscopic salpingectomy may be a more appropriate procedure. No repeat ectopic pregnancy was found in our series during the follow-up period (the average follow-up period was 2.5 years).

Table III – Length, time and cost of the 2 procedures

	Laparotomy	Laparoscopy	
Hospital stay after surgery (day)	8.59 ± 2.16	2.99 ± 1.82	*
Operating time (min)	52.36 ± 19.77	42.50 ± 20.01	*
Total cost (RMB)	3194.95 ± 935.00	4291.72 ± 602.04	*

* p < 0.01

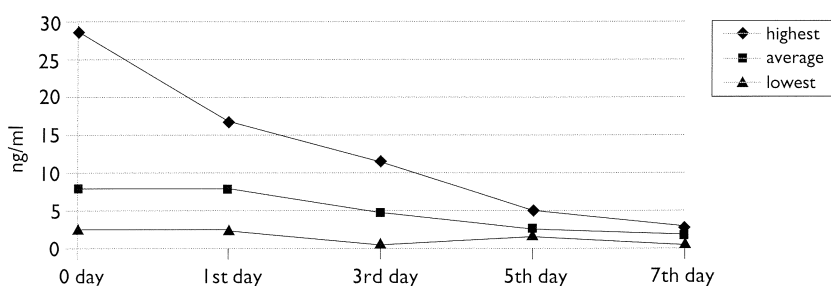


Fig 1 – hCG levels fall after conservative surgery

From the literature, we know that laparoscopic surgery is a more cost-effective approach. An average savings of approximately US\$1,200 – 1,500 for each patient can be obtained, because it significantly reduces the length of hospital stay^(1,12). In our hospital, laparoscopic removal of an ectopic pregnancy is more expensive than laparotomy. Hospitalisation in China is inexpensive. However, the capital cost of installation of an endoscopic setup is high. Hence, our cost to the patient undergoing laparoscopic procedure is higher because our hospital charges an additional amount for the use of laparoscopic equipment. Fortunately, this additional charge is affordable to most patients. Except for the charges, our patients accept the laparoscopic approaches as they feel that laparoscopic surgery gives them more advantages than open surgery.

In developed countries, more than 80% of EPs are generally treated laparoscopically. Our current rate is 50%, which means that we still have a long way to go. The laparoscopic approach is now the gold standard for the treatment of EP. We believe that the conventional laparotomy will eventually be replaced by the laparoscopic approach for almost all cases of EPs.

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