Laparoscopy Versus Laparotomy in Ectopic Pregnancy

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Abstract

Background: Ectopic pregnancy (EP) is the implantation of fertilized ovum in any site of the reproductive tract except uterine cavity. To choose laparotomy or laparoscopy for treatment is based on the patient's hemodynamic status, her past surgical history, and the physician's experience in endoscopic surgery. The goal of this study was to compare clinical and laboratory findings in women who have undergone laparoscopy or laparotomy for EP.

Methods: In this cross-sectional study, 103 women, who had undergone laparoscopic or laparotomy treatment due to EP diagnosis, were enrolled. A structured questionnaire was used to collect information. Past fertility history, past medical and drug history, clinical symptoms and signs, laboratory findings (including Hb and serum β-hCG levels), size of EP mass and its location, endometrial thickness, free fluid in pelvic or abdominal cavity, type of treatment, and method were recorded.

Results: Of the study population, 58 had undergone laparotomy and 45 had undergone laparoscopy. Mean age, mass size, and B-hCG level before surgery were significantly higher in women who had undergone laparotomy. Right tubes followed by left tubes were the most affected sites. Unstable vital sign was recorded in the laparotomy group more than the laparoscopy group.

Conclusions: Results of the current study showed that women who had undergone laparotomy had significantly higher mean age, mass size, and B-hCG level and were more unstable than the laparoscopic group.

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Introduction

Ectopic pregnancy (EP) is the implantation of fertilized ovum in any site of the reproductive tract except uterine cavity (1,2). The most common sites of EP are fallopian tubes. Ampulla, isthmus, and infundibulum are the most to the least common sites of EP in fallopian tubes followed by corneal, abdominal, ovarian, and cervical EP (3).

The overall incidence of EP is 1% of all pregnancies but its incidence increases with age, cigarette smoking, tubal inflammation, tubal surgery, carrying sterilization devices, and applying assisted reproductive techniques (ART) (4). It is the most common cause of mortality and morbidity of women during their reproductive ages (5,6).

Vaginal bleeding, abdominal pain, and less specific symptoms related to normal pregnancy such as nausea, vomiting, and breast tenderness have been stated by patients. Abdominal pain is due to peritoneal irritation because of dilated tube or hemoperitoneum. The diagnosis is based on clinical presentation, physical examination, ultrasound evaluation, and levels of serum β-hCG (7,8).

Medical treatment includes treatment with methotrexate (MTX) (either systemically or locally). The success rate of treatment with MTX has been reported between 74-100% which depends on β-hCG level (9). In cases with MTX treatment failure, laparoscopy or laparotomy treatment is recommended.

Selecting laparotomy or laparoscopy as treatment is based on the patient's hemodynamic status, her past surgical history, and the physician's experience in endoscopic surgery.

Laparoscopy has been used as a diagnostic and therapeutic modality for many years (10). Shorter operation time, less hospital stay, lower cost, less blood transfusion, and analgesic requirements are among the advantages of laparoscopic treatment in comparison to laparotomy in the management of EP. On the other hand, in cases with previous history of infection or surgery (suspicious to adhesions), and unstable

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hemodynamic status, laparotomy is indicated.

The goal of this study was to compare clinical and laboratory findings in women who have undergone laparoscopy or laparotomy because of EP.

Materials and Methods

In this cross-sectional study, 103 women, who had undergone laparotomy or laparoscopic treatment due to EP diagnosis, were enrolled.

The inclusion criterion for laparotomy or laparoscopy was definite as occurrence of EP, and the exclusion criteria was treatment with MTX. The study was conducted in Women's Hospital, Tehran, Iran, between January 2011 and December 2012. The study had been approved by the local ethics committee and all cases signed informed consent forms before the study. EP diagnosis was based on ultrasound evaluation and serum β-hCG level.

A structured questionnaire was used to collect information. Past fertility history, past medical and drug history, clinical symptoms and signs, laboratory findings (Hb and serum β-hCG levels), size of EP mass and its location, endometrial thickness, free fluid in pelvic or abdominal cavity, and type of treatment and method were recorded. SPSS for Windows (version 18; SPSS Inc., Chicago, IL, USA) was used for data analysis. Data are presented as mean (± SD), median, and frequencies. The Student's independent t-test and Mann-Whitney test were used for continuous variables, and the Pearson correlation and Fisher's exact test were applied for categorical variables. P value of 0.05 was considered statistically significant.

Results

In the present study, 103 women, who underwent laparoscopy or laparotomy during the study period, were included. Of the study population, 58 had undergone laparatomy and 45 had undergone laparoscopy. Mean age, mass size, and B-hCG level before surgery were significantly higher in women who underwent laparotomy (Table 1).

Unstable vital sign was recorded in the laparotomy group more than the laparoscopy group (Table 2).

Discussion

The results of the current study showed that mean age, size of EP mass, and B-hCG level before surgery were significantly higher in women who had undergone laparotomy than women who had undergone laparoscopy. Our findings are compatible with the findings of Ding et al. They found higher mean age and mean B-hCG in the laparotomy group (5). As larger EPs are prone to rupture, patients with large EP and higher serum B-hCG levels will undergo laparotomy.

We also found that unstable vital sign was significantly higher in women who underwent laparotomy than the other group due to the same reasoning as was mentioned.

In a study, Shrestha and Saha evaluated 12 patients managed by laparoscopy and 20 managed by laparotomy. They found that all patients who underwent laparoscopy and 40% who underwent laparotomy were stable before surgery. In their study, salpingectomy was the most common procedure in both routes of surgery (11). In our study, salpingostomy was the most common procedure in the laparoscopy group and salpingectomy was the most common procedure in the laparotomy group.

Abdominal pain plus vaginal bleeding was the most common symptom in both groups, but free fluid was more common in the laparotomy group.

Ectopic pregnancy (EP) is a cause of mortality and morbidity and a serious cause of pregnancy which accounts for 80% of maternal deaths occurring during the first trimester (12).

Table 1. Demographic characteristics and laboratory findings in patients

	Laparotomy group	**Laparoscopy group**	**P-value**
Age (mean ± SD) (year)	30.3 (± 5)	27.11 (± 5.6)	0.003
Gravidity (median)	2	1	0.02
Mass size (mean ± SD) (mm)	29.14 (± 15.2)	22.8 (± 12.4)	0.02
Endometrial thickness (mean ± SD) (mm).	9 (± 3.4)	8.7 (± 3)	0.5
Hemoglobin (Hb) before surgery (mean ± SD)	11.2 (± 1.8)	11.7 (± 0.3)	0.1
B-hCG level before surgery (mean ± SD)	10546.5 (± 15022.9)	4593.9 (± 4330.2)	0.005
B-hCG level after surgery (mean ± SD)	4532.2 (± 16601.3)	988.7 (± 1266.1)	< 0.001
Gestational age (median)	7	8	0.5
Type of surgery			
Salpingostomy	12	39	< 0.001
Salpingotomy	18	0	
Salpingectomy	28	6	
Location of EP			
Right tube	38	32	
Left tube	18	12	0.3
Left ovary	1	1	
Coronal	1	0	

Table 2. Clinical history and clinical findings in two groups

	Laparotomy group	Laparoscopy group	P-value
Past EP history			
Yes	6	4	0.5
No	52	41	
Infertility history			
Yes	12	5	0.4
No	46	40	
Past surgical history			
Yes	25	13	0.3
No	33	32	
Contraception use			
Yes	11	10	0.7
No	47	35	
Symptoms			
Abdominal pain	7	8	
Vaginal bleeding	3	5	0.4
Abdominal pain plus vaginal bleeding	43	26	
Other	5	6	
Vital sign			
Stable	45	45	< 0.001
Unstable	13	0	
Free fluid			
Yes	39	20	0.17
No	19	25	
Gestational sac present			
Yes	14	5	0.14
No	44	40	

The most common sites of EP are the fallopian tubes. In the current study, the median gestational age in both groups was in the range of the first trimester (7 weeks in the laparotomy group and 8 weeks in the laparoscopy group) and fallopian tubes were the most common sites. As our results show, the fallopian tubes were the most common sites (97%) and the right tubes were involved more than the left tubes.

In recent years, incidence of EP has increased dramatically as the risk factors of EP have increased. Previous EP, tubal damage from surgery, a history of infertility, and increased age can increase the rate. In this study, history of EP, surgery, and infertility were higher in the laparotomy group, which is consistent with the findings of Ding et al. (5).

Laparoscopy has been considered as the gold standard for EP treatment, but in cases with unstable vital sign, laparotomy is preferable (13). Since the late 1960s, laparoscopy has been used in the diagnostic management of EP. By means of laparoscopy, short observation time, less anesthetic agent and blood transfusion, and less time are achievable (5).

Conclusion

The results of current study showed that women who underwent laparotomy had significantly higher mean age, size of EP mass, and B-hCG level. There was a higher rate of unstable vital signs in the laparotomy group than the laparoscopic group.

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