Original Article

Comparison between Operative Laparoscopy and Laparotomy in the Management of Haemodynamically Stable Patients with Ectopic Pregnancy

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ABSTRACT

Objective: To compare operative[1] laparoscopy vs laparotomy in the management of haemodynamically stable patients with ectopic pregnancy.

Study Design: Comparative study.

Place and Duration of Study: This study was conducted at the Department of Obstetrics & Gynaecology, Sheikh Zaid Hospital, Rahim Yar Khan from October 2017 to April 2018.

Materials and Methods: Total 72 married females of reproductive age (15-49 years) presenting in emergency/OPD of Obstetrics & Gynecology with suspected diagnosis of ectopic pregnancy till 8 weeks of gestation confirmed by transvaginal ultrasound, haemodynamically stable patients as defined in operational definitions having ß-hCG< 6000 IU/L were included in the study.

In study group A, laparoscopy was performed and in group B laparotomy was performed. Operative duration, postoperative hospital stay and wound infection was compared between the both groups.

Results: A total of 72 patients were selected for this study. Mean age of the patients was 27.56±4.23 and 25.56±4.15 years in group-A and B, respectively. In group-A, mean gestational age was 6.0±1.2 weeks and in group group-B 5.7±1.1 weeks. In laparoscopy group (A), no wound infection was noted but in laparotomy group (B), there were 4 (11.1%) patients found with wound infection. Statistically significantly difference between wound infection of both groups was noted with p value 0.040. In group A mean duration of operation was 79.89 ± 2.90 and in group B was 95.94 ± 2.55 minuets. Mean post operative hospital stay was 1.06 ± 0.23 days in group A while 3.17 ± 1.44 days in group B.

Conclusion: In conclusion, laparoscopic treatment of ectopic pregnancy yielded superior benefits over laparotomy in terms of less operative time and less postoperative hospital stay. Additionally, laparoscopy has a great role in diagnosis of clinically suspicious cases. Therefore, laparoscopy should be opted whenever possible.

Key Words: Management of ectopic pregnancy, Laparoscopy, Laparotomy

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INTRODUCTION

Ectopic pregnancy is defined as a pregnancy that is implanted outside the uterine cavity i.e. at a site that by nature is not designed anatomically and physiologically to accept the conception or to permit its growth and development.[1]

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The most common site is the tube (95%), the cervix, ovary, broad ligament or elsewhere in peritoneal cavity. There are many predisposing factors leading to ectopic pregnancy i.e. by induced abortion, pelvic inflammatory diseases, miscarriages and pelvic surgery. Previous use of intrauterine contraceptive devices (IUCD) as well as smoking also increases risk.[2-3] Age and race are not the significant risk factors.

Ectopic pregnancy was first discovered in the 11th century. The incidence of ectopic pregnancy varies between 100 and 175 per 100,000 women aged 15-44 years.[4] The Centre for Disease Control (CDC) reports that the incidence of ectopic pregnancies is 1 in 70 pregnancies while in Pakistan it varies from 1:1124 to 1:130 pregnancies.[5] The incidence rises significantly after assisted reproductive technology (ART) and varies from 2-11%.[6]

Ectopic pregnancy remains a leading cause of maternal mortality in first trimester and is responsible for about 9 percent of maternal mortalities in the United States. The

accurate diagnosis of ectopic pregnancy can now be made at an early stage by using pregnancy tests and high-resolution transvaginal ultrasound. This can lead to more options for treating ectopic pregnancy.

Surgeons use laparoscopy or laparotomy to gain access to the pelvis and can either incise the affected fallopian and remove only the pregnancy or remove the affected tube with the pregnancy.

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. The advantage of operative laparoscopy for ectopic pregnancy over laparotomy is associated with shorter operation times, shorter hospital stay and less wound infection.

Study conducted in Nepal showed that incidence of wound infection was 5.0±0.1% in patients treated with laparotomy while no wound infection was observed in patients treated with laparoscopy.[7]

Study conducted in Burlington showed that operative duration was less in laparoscopy than laparotomy (77.5±26.1 vs 103.6±26.7 minutes) and postoperative hospital stay was also less in laparoscopy than laparotomy (1.34±0.8 vs 4.5±1.1 days).[8]

As no local data is available on this topic and less data is available about outcome variable like wound infection taken from different international studies there it is unclear to which procedure should adopt. So the rationale of present study is to access the outcome of laparoscopy with laparotomy that will be helpful in determining which procedure should be adopted.

Ectopic Pregnancy: A pregnancy that implanted outside the uterine cavity most commonly in fallopian tube, cervix, ovary, broad ligament or in peritoneal cavity confirmed by transvaginal ultrasound.

Haemodynamic Stable Patients: One in which following vitals were seen, blood pressure 110/70 to 130/80mmHg. Pulse 60-100 per minute, temperature 98.6°F.

Operative Duration: This was calculated in mean operative duration from start of surgery till skin suturing.

Postoperative Hospital Stay: This was calculated as mean postoperative hospital stay starting from postoperative duration till discharge

Wound Infection: Presence of any one of the followings after 8 days of surgery, purulent or serous discharge from incision line or gaped wound or pyrexia > 100.

MATERIALS AND METHODS

This randomized controlled trial was conducted at Department of Obstetrics &Gynaecology, Sheikh Zaid Hospital, Rahim Yar Khan for 6 months from October 2017 to April 2018.

Total 72 married females of reproductive age (15-49 years) presenting in emergency/OPD of Obstetrics & Gynecology with suspected diagnosis of ectopic pregnancy till 8 weeks of gestation confirmed by transvaginal ultrasound, haemodynamically stable patients as defined in operational definitions having ß-hCG< 6000 IU/L were included in the study.

The patient has a medically treatable ectopic pregnancy, the history is suggestive of minimal pelvic adhesions were excluded from the study.

Study was approved by ethical committee and written informed consent was taken from every patient. Selected patients were randomly divided into two groups A and B.

In study group A, laparoscopy was performed and in group B laparotomy was performed. Details of operative duration, postoperative hospital stay and wound infection was gathered. All this information was collected on a pre-designed proforma along with demographic profile of the patients.

Data was analyzed in SPSS version No. 16. Qualitative data (wound infection) was summarized in the form of frequencies and proportions.

Quantitative data (age of patient, gestational age, operative duration, postoperative hospital, stay) was summarized in mean±standard deviation.

Confounding variables (age of patient, parity) were controlled through stratification. Post-stratification applying chi square test for wound infection and student t test for mean operation duration and postoperative hospital stay.

Chi square test was applied to compare wound infection and student's t test was applied for mean operative duration and post-operative hospital stay between two groups. P value $p \leq 0.05$ was consider as significant.

RESULTS

A total of 72 patients were selected for this study and randomly divided into two groups A and B. In group-A mode of treatment was laparoscopy and in group-B mode of treatment was laparotomy.

Patients ranged between 15-40 years of age. Mean age of the patients was 27.56±4.23 and 25.56±4.15 years in group-A and B, respectively. In group-A, mean gestational age was 6.0±1.2 weeks and in group group-B 5.7±1.1 weeks.

In laparoscopy group (A), no wound infection was noted but in laparotomy group (B), there were 4 (11.1%) patients found with wound infection. Statistically significantly difference between wound infection of both groups was noted with p value 0.040 (Table 1)

In group A mean duration of operation was 79.89 ± 2.90 and in group B was 95.94 ± 2.55 minuets. Mean duration of operation time was significantly higher in group B as compared to group B with p value 0.001. (Table 2)

Mean post operative hospital stay was 1.06 ± 0.23 days in group A while 3.17 ± 1.44 days in group B.

difference of mean post operative hospital stay was statistically significant with p value 0.001 (Table 3)

Two age groups 15-30 years and 31-40 years were made. In age group 15-30, no patient of group A found with wound infection while 4 patients of group B found with wound infection and the difference was statistically significant with p value 0.048. In age group 31-40 years, no patients was found with wound infection.

Patients were divided into two groups according to parity i.e. para 0-3 and para 4-7. In para 0-3 group, wound infection found only in 4 (26%) patients of study group B and no wound infection was found in study group A. The difference was statistically significant with p value 0.033. In para 4-7 group, no wound infection was noted in both study groups. (Table 4)

In age group 15-30 years, mean operation time in study group A was 80.28 ± 3.02 minutes and in group B was 96.06 ± 2.60 minutes. Mean operation duration was significantly (P = 0.001) higher in study group B as compared to study group A. In age group 31-40 years, mean operation time was 78.29 ± 1.70 and 95.00 ± 2.16 minutes. Statistically significant difference between mean operation duration was noted with p value 0.001.

In para 0-3 group, mean operative time in group and B was 80.09 ±2.95 minutes and 96.30 ± 2.42 minutes and the difference was statistically significant with p value 0.001. In para 4-7 group, mean operative time in group A was 78.25 ± 2.06 minutes and in group B was 94.17 ± 2.63 minutes. The difference of mean operative time between the both groups was statistically significant with p value 0.001. (Table 5)

Table No.1: Comparison of wound infection between the both groups

Wound infection	Group-A (Laparoscopy)		Group-B (Laparotomy)	
	No.	%	No.	%
Yes	0	0	04	11.1
No	36	100	32	88.9
Total	36	100.0	36	100.0
P Value	0.040			

Table No.2: Comparison of mean duration of operation (minute)

Group	Mean	S.D
Group-A (Laparoscopy)	79.89	2.90
Group-B (Laparotomy)	95.94	2.55
P value	P < 0.001	

Table No.3: Comparison of mean postoperative hospital stay (days)

Group	Mean	S.D
Group-A (Laparoscopy)	1.06	0.23
Group-B (Laparotomy)	3.17	1.44
P value	0.001	

In age group 15-30 years, mean hospital stay in group A was 1.03 ± 0.18 days and in group B was 3.28 ± 1.48 days. Difference of hospital stay between both groups was statistically significant with p value 0.001. In age group 31-40 years, 1.14 ± 0.37 days and 2.25 ± 0.50 days respectively in study group A and B and the difference was statistically significant with p value 0.001.

Table No.4: Stratification for age and parity with regard to wound infection

Group	15-30 (Year)		31-40 (Year)	
	Wound infection		Wound infection	
	Yes	No	Yes	No
Group-A (Laparoscopy)	0	29	0	7
Group-B (Laparotomy)	4	28	0	4
P value	P=0.048		Cannot do statistical test because a column total is 0	
Group	Para 0-3		Para 4-7	
	Wound infection		Wound infection	
	Yes	No	Yes	No
Group-A (Laparoscopy)	0	32	0	4
Group-B (Laparotomy)	4	26	0	6
P value	P=0.033		Cannot do statistical test because a column total is 0	

Table No.5:Stratification of age and parity with regard to mean operation duration (minute)

Group	AGE 15-30 (Year)		AGE 31-40 (Year)	
	Operation duration		Operation duration	
	Mean	S.D	Mean	S.D
Group-A (Laparoscopy)	80.28	3.02	78.29	1.70
Group-B (Laparotomy)	96.06	2.60	95.00	2.16
P value	p<0.001		p<0.001	
Group	Para (0-3)		Para (4-7)	
	Operation duration		Operation duration	
	Mean	S.D	Mean	S.D
Group-A (Laparoscopy)	80.09	2.95	78.25	2.06
Group-B (Laparotomy)	96.30	2.42	94.17	2.63
P value	p<0.001		p<0.001	

In para 0-3 group, mean hospital stay in group A and B was 1.06 ± 0.24 days and 3.30 ± 1.53 days respectively. Difference of hospital stay between the both groups was statistically significant with p value 0.001. In para 4-7 group, mean hospital stay was 1.00 ± 0.00 days and 2.50 ± 0.54 days respectively in study group A and B

and the difference was statistically significant with p value 0.001. (Table 6)

Table No.6: Stratification of age and parity with regard to mean postoperative hospital stay (days)

Group	AGE 15-30 (Year)		AGE 31-40 (Year)	
	Hospital stay		Hospital stay	
	Mean	S.D	Mean	S.D
Group-A (Laparoscopy)	1.03	0.18	1.14	0.37
Group-B (Laparotomy)	3.28	1.48	2.25	0.50
P value	p<0.001		p<0.001	
Group	Para (0-3)		Para (4-7)	
	Hospital stay		Hospital stay	
	Mean	S.D	Mean	S.D
Group-A (Laparoscopy)	1.06	0.24	1.00	0.00
Group-B (Laparotomy)	3.30	1.53	2.50	0.54
P value	p<0.001		P=0.001	

DISCUSSION

The incidence of ectopic pregnancy has increased all over the world from 5 per 1000 pregnancies during the past three decades to almost 20 per 1000 pregnancies at present.[9-10]

An emerging technique of assisted reproductive technology, which was found to increase risk of ectopic pregnancy by 5%, is one possible reason for such a steep rise in the incidence.[10]

Delayed diagnosis of ectopic pregnancy may result in rupture and acute blood loss. Massive blood loss from ectopic mass accounted for 10-15% of overall maternal mortality in the first trimester in the past few decades.[11]

An appropriate and timely treatment of ectopic pregnancy plays an important role in reducing morbidity and mortality caused mainly by massive intraabdominal hemorrhage. Surgery which remains the mainstay of treatment can be approached either by laparotomy or laparoscopy.[12]

Yuen et al who conducted a retrospective study comparing treatment outcomes of laparoscopic surgery and laparotomy in 105 patients who had ectopic pregnancy. The authors demonstrated that laparoscopic group had lower incidence of ruptured ectopic mass during operation and lower hemoperitoneum compared to laparotomy group.[13]Actually, these more favorable factors of unruptured ectopic mass and lesser amount of hemoperitoneum may be the cause or reason (rather than the effect or result) why the surgeon made his decision to perform laparoscopy rather than laparotomy.

Present study, found a statistically significant longer operative time in laparotomy group than laparoscopic (95.94±2.55 vs 79.89±2.90 minutes, p-value < 0.001). This was consistent with previous study of Brumstedet al[12] who reported a shorter operative time in laparoscopic group. Similarly, results of Brumstedet al[8] also demonstrated that operative duration was shorter in laparoscopy than laparotomy.

In present study, postoperative hospital stay (days) was less in laparoscopy group than laparotomy (<0.001). These findings are comparable to Brumsted et al.[8] Similar results were shown in different studies and this was noted as an advantage.[8,14-15]

In current study, mean age of the patients was 27.56±4.23 and 25.56±4.15 in laparoscopy group and laparotomy, respectively, comparable to the studies carried out by Pradhan et al[16] and Wafaa P.[17]

Because laparoscopy has been shown to be superior to laparotomy, it has become the gold standard for the treatment of EP.[18] 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.[13]

CONCLUSION

In conclusion, laparoscopic treatment of ectopic pregnancy yielded superior benefits over laparotomy in terms of less operative time and less postoperative hospital stay. Additionally, laparoscopy has a great role in diagnosis of clinically suspicious cases. Therefore, laparoscopy should be opted whenever possible.

More data from a prospective well controlled study are needed to confirm these favorable results of the laparoscopic treatment approach for ectopic pregnancy.

Author's Contribution:

Concept & Design of Study:	Sadia Zahoor
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Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

1. Shaw JL, Dey SK, Critchley HO, Horne AW. Current knowledge of the aetiology of human tubal ectopic pregnancy. Hum Reprod Update 2010;16:432-44.
2. Saleh F, Shukar-ud-din S. Tubal ectopic pregnancy after bilateral tubal ligation. J Surg Pak 2012;17: 38-9.
3. Fernandez H, Gervaise A. Ectopic pregnancies after infertility treatment: modern diagnosis and therapeutic strategy. Hum Reprod Update 2004;

10:503-13.
4. Coste J, Bouyer J, Ughetto S, Gerbaud L, Fernandez H, Pouly JL, et al. Ectopic pregnancy is again on the increase. Recent trends in the incidence of ectopic pregnancies in France (1992-2002). Hum Reprod 2004;19:2014-8.
5. Khawaja NP, Rehman R, Durrani Z. Ectopic pregnancy at gynaecology unit II Sir Ganga Ram Hospital, Lahore; study of fifty cases. Pak J Obstet Gynecol 1998;11:61-5.
6. Musarrat J, Babar A, Jakimiuk J. Bilateral ectopic pregnancy following ovulation induction JPM 2010; 24:160–2.
7. Shrestha J, Saha R. Comparison of laparoscopy and laparotomy in the surgical management of ectopic pregnancy. J Coll Physicians Surg Pak 2012; 22:760-4.
8. Brumsted J, Kessler C, Gibson C, Nakajima S, Riddick DH, Gibson M. A comparison of laparoscopy and laparotomy for the treatment of ectopic pregnancy. Obstet Gynecol 1988;71: 889-92.
9. Nama V, Manyonda I. Tubal ectopic pregnancy: diagnosis and management. Arch Gynecol Obstet 2009;279:443-53.
10. Centers for Disease Control and Prevention (CDC). Ectopic pregnancy-United States, 1990-1992. MMWR Morb Mortal Wkly Rep 1995;44:46-8.
11. Abbott A, Emmans LS, Lowenstein SR. Ectopic pregnancy: ten common pitfalls in diagnosis. Am Emerg Med 1990;8:512-22.
12. Brumsted A, Kessler C, Gibson C, Nakajima S, Riddick DH, Gibson M. A comparison of laparoscopy and laparotomy for the treatment of ectopic pregnancy. Obstet Gynecol 1988;71:889-902.
13. Yuen PM, Rogers MS, Chang A. A review of laparoscopy and laparotomy in the management of tubal pregnancy. Hong Kong Med J 1997;3:153-7.
14. Gupta B. Role of minimally invasive surgery in the treatment of ectopic pregnancy. World J of Laparoscopic Surg 2008;1:36-9.
15. Leslie L, Pun TC, Chan S. Tubal ectopic pregnancy: an evaluation of laparoscopic surgery versus laparotomy in 614 patients. Aust NZJ Obstet Gynecol 1999;39:185-7.
16. Pradhan P, Thapamagar SB, Maskey S. A profile of ectopic pregnancy at Nepal Medical College Teaching Hospital, Nepal. Med Coll J 2006; 8: 238-42.
17. Wafaa MF. Diagnosis and management of ectopic pregnancy in King Abdulaziz University Hospital: a four-year experience. JKAU Med Sci 2008; 15:15-25.
18. Lehner R, Kucera E, Jirecek S, Egarter C, Husslein P. Ectopic pregnancy. Arch Gynecol Obstet 2000; 263:87–92.