Gynaecological Endoscopy, 1997
6, 169–172

Incidence of recurrent ectopic pregnancy in relation to operative technique

Namık K. Duru, Vedat Atay, Ali Ergün, Recai Pabuçcu, Saffet Dilek, Bülent A. Aydin and Gökalp Tokaç

Accepted for publication 16 January 1997

Abstract

Objective To determine the incidence of recurrent ectopic pregnancies in four groups of patients with different conservative or radical operative techniques via laparoscopy or laparotomy.
Design Retrospective analysis.
Setting Tertiary centre for reproductive medicine
Subjects 56 patients who were operated upon and followed up for at least 2 years were included in the study.
Interventions The operations performed included linear salpingotomy ($n = 21$) and salpingectomy ($n = 9$) via laparoscopy, and linear salpingotomy with tubal reconstruction ($n = 9$) and salpingectomy with segmental resection ($n = 23$) at laparotomy.
Results Recurrent ectopic pregnancy was found in 19% (4/21) of the laparoscopic salpingotomy group ($P < 0.05$). No recurrence was seen in the laparoscopic salpingectomy group. Recurrence was found in one case (11%) ($P < 0.05$) after salpingotomy with tubal reconstruction, and in one case (4.3%) of salpingectomy at laparotomy.
Conclusion Conservative surgery for unruptured tubal pregnancy either via laparoscopy or laparotomy carries increased risk for repeated ectopic pregnancy.

Keywords: recurrent ectopic pregnancy, salpingectomy, salpingotomy.

Introduction

Salpingotomy for tubal pregnancy was first reported in 1953 by Stromme.[1] Salpingotomy (salpingostomy) is described as conservative and salpingectomy as radical surgery for treatment of tubal pregnancy. In 1990, the American College of Obstetricians and Gynecologists reported that salpingostomy was the surgical treatment of choice for unruptured ectopic pregnancy, rather than salpingectomy.[2] In the last decade, laparoscopy has taken its place as the preferred surgical technique for management of ectopic pregnancy, as high-resolution transvaginal ultrasound and rapid serial quantitative serum β-hCG testing have given gynaecologists the opportunity of diagnosing ectopic pregnancy in the unruptured phase. Moreover, laparoscopy can be used even for salpingectomy in radical surgery for ruptured cases, in haemodynamically stable patients. Conservative surgery either via laparoscopy or laparotomy carries the risks of recurrence and persistence of ectopic pregnancy.[3–5]

In this retrospective analysis, we evaluated the recurrence of ectopic pregnancy in relation to operative technique.

Subjects and methods

A total of 56 patients, who had been operated upon for ectopic pregnancy and followed up for at least 2 years, between January 1990 and January 1996 at the Obstetrics and Gynaecology Department of Gülhane School of Medicine, were included in the study. The patients were operated upon consecutively, and the operative technique was selected in a non-random fashion according to the tubal rupture and haemodynamic status of the cases.

Altogether 62 operations were performed in 56 patients; six patients (11%) had a second operation for recurrent ectopic pregnancy. Cases were grouped into four different operations: laparoscopic salpingotomy ($n = 21$); laparoscopic salpingectomy ($n = 9$); salpingotomy with tubal reconstruction at laparotomy ($n = 9$), and salpingectomy (segmental resection) at laparotomy ($n = 23$) (Table 1).

Of the women, 51% were nulliparous, and no significant differences were seen in the ages of the groups. Infertility and previous abdominopelvic surgery (laparoscopy or laparotomy) were associated with 35 and 23%, respectively, of the women, and 17% had been fitted with an intrauterine device. Of the infertile cases, 60% (12/20) were in the laparoscopic salpingotomy group (Table 2).

Concerning the operative findings: tubal rupture, contralateral tubal adhesions and haemodynamic instability were seen in 46, 5 and 21% of the total respectively. All of the haemodynamically unstable cases and 76% (20/26) of cases with tubal rupture were in the salpingectomy at laparotomy group.

N. K. Duru MD
V. Atay MD
A. Ergün MD
R. Pabuçcu MD
S. Dilek MD
B. A. Aydin MD
G. Tokaç MD
Gülhane School of Medicine
Ankara
Turkey

Correspondence: N. K. Duru, Gata Kadın hastalıkları ve Doğum ABD, Elik 06018, Ankara, Turkey.

Table 1 Operation techniques and findings related to recurrence

	Laparoscopy		Laparotomy		Total	
	Salpingotomy	Salpingectomy	Salpingotomy, with tubal reconstruction	Salpingectomy, segmental resection	*n*	%
Primary operations for ectopic pregnancy	21	6	9	20	56	
Operations for recurrent ectopic pregnancies	—	3	—	3	6	11
Total number of operations	21	9	9	23	62	
Recurrent cases	4 (19%)*	0	1 (11%)**	1 (4.3%)	6	11
Tubal rupture	—	6	—	20	26	46
Contralateral adhesion	2	—	1	—	3	5
Haemodynamic instability	—	—	—	12	12	21

*$P < 0.001$.
**$P < 0.05$.

Table 2 Patient characteristics

	Laparoscopy		Laparotomy		
	Salpingotomy	Salpingectomy	Salpingotomy (with tubal reconstruction)	Salpingectomy (segmental resection)	Total
Age (range), years	27.1 (18–34)	29.3 (21–38)	28.6 (19–35)	30.9 (20–44)	
Nulliparous	16	1	7	5	29 (51%)
Parous	5	5	2	15	27 (49%)
Infertile	12	—	4	2	20 (35%)
Previous use of intrauterine device (IUD)	2	5	—	3	10 (17%)
Previous abdominopelvic surgery	6	2	2	3	13 (23%)

Table 3 Summary of cases with recurrence

	Primary ectopic, first operation	Recurrent ectopic, second operation	Interval between ectopics, years	Tube affected in recurrent ectopic
I	Laparoscopic salpingotomy	Salpingectomy at laparotomy	1	Ipsilateral
II	Salpingotomy at laparotomy	Laparoscopic salpingectomy	2	Ipsilateral
III	Laparoscopic salpingotomy	Laparoscopic salpingectomy	2	Ipsilateral
IV	Salpingectomy at laparotomy	Salpingectomy at laparotomy	2	Contralateral
V	Laparoscopic salpingotomy	Laparosxopic salpingectomy	2	Ipsilateral
VI	Laparoscopic salpingotomy	Salpingotomy at laparotomy	4	Ipsilateral

Statistical analysis was carried out using Student's *t*-test and $P < 0.05$ was judged as significant.

Results

A total of 62 operations performed in 56 patients with ectopic pregnancies were evaluated for at least 2 years with respect to recurrence (Tables 1 and 3).

Laparoscopic salpingotomy was performed in 21 cases (33%), and neither tubal rupture nor haemodynamic instability were seen in this group of patients. Contralateral adhesions were seen in two of these cases. In this group the number of recurrent cases was four (19%, 4/21); all of these women were infertile, and the only recurrence was in the ipsilateral tube.

Laparoscopic salpingectomy was performed in six cases for primary, and in three cases for recurrent ectopic pregnancy. Tubal rupture was seen in all of the cases (6/6) with primary ectopic pregnancy. Laparoscopic salpingectomy for recurrent ectopic pregnancy was performed in two cases where there had been previous laparoscopic salpingotomy. None of the cases with primary ectopic pregnancy operated as laparoscopic salpingectomy were infertile. No recurrence was seen in this group.

Salpingotomy (with tubal reconstruction) via laparotomy was performed in nine cases (14%). Neither tubal rupture nor haemodynamic instability was seen in this group of conservatively operated cases. Contralateral adhesions were seen in one case. Only one of the cases with salpingotomy at laparotomy had recurrent ectopic pregnancy in the ipsilateral tube (11%).

Salpingectomy (segmental resection) via laparotomy was performed in 20 cases for primary, and in three cases with recurrent ectopic pregnancy (39%). Tubal rupture was seen in all the cases (20/20) with primary ectopic pregnancy. All of the haemodynamically unstable cases (21%, 12/56) were operated upon by salpingectomy at laparotomy. Salpingectomy by means of laparotomy for recurrent ectopic pregnancy was performed in two cases following laparoscopic salpingotomy in the ipsilateral tube, and in the third case it followed salpingectomy via laparotomy in the contralateral tube. Thus one of the cases with salpingectomy at laparotomy had a recurrent ectopic pregnancy in the contralateral tube (4.3%).

The rate of recurrence was calculated as 11% (6/56) in total. Interestingly, the recurrence rate for conservative operations (laparoscopic plus laparotomic) was found to be 17% (5/30) and for radical techniques (laparoscopic plus laparotomic) it was 4% (1/26) ($P < 0.05$).

Discussion

It should be emphasized that there is no prospective study in the literature related to fertility outcome and recurrence or persistence of ectopic pregnancy. Furthermore, many of the existing studies concern a limited number of cases. In a review of the related literature, the incidence of recurrent ectopic pregnancy was found to be between 5.8 and 38.0%, regardless of the type of operation.[6]

Tubal damage prior to or induced by the initial ectopic pregnancy seems to be the main cause of repeated ectopic pregnancy.

In an evaluation of fertility outcome after conservative laparoscopic treatment Pouly *et al.* reported on the importance of ipsilateral adhesions and the condition of the contralateral tube.[3] They found the rates of recurrence to be 12% in total, but 21.3% where the contralateral tube was non-functional and 9.7% where it was functional.

In a follow-up study comparing fertility after radical and conservative techniques, Tuomivaara & Kauppila found recurrence rates of 13 and 14% respectively.[4] In the latter study the condition of the contralateral tube after ectopic pregnancy was found to be important for fertility. The risk of repeated ectopic pregnancy was reported as 52% in patients with affected contralateral tubes, and 9% in patients where the contralateral tubes were normal. Furthermore, Langer *et al.* reported recurrence rates of 7.7% in patients with normal contralateral tubes,

and of 28.5% in patients with severely damaged or absent contralateral tubes.[7]

The findings of these studies suggest that damage in both tubes, before the initial ectopic pregnancy, plays a significant role. The rate of recurrent ectopic pregnancy is increased significantly when the contralateral tube is severely affected or absent. However, in a study by Joesoef *et al.*, evaluating the role of salpingitis in recurrent ectopic pregnancy, salpingitis was reported as a risk factor for the first ectopic pregnancy, but previous salpingitis was not found to add an incremental risk for repeated ectopic pregnancy.[8]

On the other hand, our results indicate a significantly increased risk of recurrence after conservative management (17%), both via laparoscopy and laparotomy where all the patients have functioning contralateral tubes, compared with salpingectomy (4%). Our results also contradict related literature in that the recurrence rate after laparoscopic management was found to be 13% (4/30), and it was 6% (2/32) after laparotomy. However, Querleu & Boutteville reported that the only increase in the rate of recurrence was with conservative surgery in comparison with radical surgery.[9]

In this study one of the recurrent ectopic pregnancies occurred in the contralateral tube after a previous salpingectomy. In a study by Valle & Lifchez, 11 patients with salpingectomies had recurrent ectopics and were treated conservatively and, interestingly, all had intrauterine pregnancies without a third ectopic.[10]

Pouly *et al.*, in their multifactorial analysis, developed a therapeutic scoring system for ectopic pregnancy which is inversely correlated with intrauterine pregnancy rate and directly with recurrence and infertility.[3] Previous ectopic pregnancy, previous laparoscopic adhesiolysis, previous tubal microsurgery, solitary tube, previous salpingitis, homolateral adhesions and contralateral adhesions were considered to be the risk factors in evaluation of the patient with an ectopic pregnancy, for decisions concerning the treatment modality. If the patient has many of the risk factors, radical laparoscopic treatment (salpingectomy), even possibly with contralateral sterilization and IVF for future fertility, is offered.

In a recent review, Rulin has considered the additional cost of persistent and recurrent ectopic pregnancies after conservative surgery when compared with salpingectomy.[11]

Our data show no recurrence in the laparoscopic salpingectomy group (0/6) and only one in the salpingectomy via laparotomy group (1/20). The total rate of recurrence for salpingectomy is 4% (1/26). The recurrence rate in laparoscopic salpingotomy is 19% (4/21) and it is 11% (1/9) in salpingotomy via laparotomy. The total recurrence rate after salpingotomy is 17% (5/30). Although it involves limited numbers, this study clearly indicates an increased risk for repeated ectopic pregnancy after conservative surgery in unruptured tubal pregnancy either via laparoscopy or laparotomy.

The outcome of conservative operations has almost always been retrospectively evaluated using as indices the rates of intrauterine pregnancy, recurrent or persistent ectopics and infertility. As for conclusion we need to perform randomized prospective studies with second-look laparoscopy for tubal evaluation after conservative and radical surgery. Finally, given the increased rates of recurrence and persistence of ectopic pregnancy in an era of more experience with IVF, the surgical procedure of choice for primary unruptured tubal pregnancy is a matter for debate.

References

1 Stromme WB. Salpingotomy for tubal pregnancy: report of a successful case. *Obstetrics and Gynecology* 1953; **1:** 472–5.

2 American College of Obstetricians and Gynecologists. *ACOG Technical Bulletin No. 150.* Washington DC: American College of Obstetricians and Gynecologists, 1990.

3 Pouly JL, Chapion C, Manhes H, Canis M, Wattiez A, Bruhat MA. Multifactorial analysis of fertility after conservative laparoscopic treatment of ectopic pregnancy in a series of 223 patients. *Fertility and Sterility* 1991; **56(3):** 453–60.

4 Tuomivaara L, Kauppila A. Radical or conservative surgery for ectopic pregnancy? A follow-up study of fertility of 323 patients. *Fertility and Sterility* 1988; **50(4):** 580–3.

5 Lundorff P, Hahlin M, Sjöblom P, Lindblom B. Persistent trophoblast after conservative treatment of tubal pregnancy: prediction and detection. *Obstetrics and Gynecology* 1991; **77:** 129–33.

6 Russell JB, Rodgers MS. Repeated ectopic pregnancy. *Obstetric and Gynecologics Clinics of North America* 1991; **18(1):** 145–51.

7 Langer R, Golan A, Raziel A, *et al.* Reproductive outcome after conservative surgery for unruptured tubal pregnancy: a 15-year experience. *Fertility and Sterility* 1990; **53:** 227.

8 Joesoef MR, Werstrom L, Reynolds G, Marchbanks P, Cates W. Recurrence of ectopic pregnancy: the role of salpingitis. *American Journal of Obstetrics and Gynecology* 1991; **165(1):** 46–50.

9 Querleu D, Boutteville C. Fertility after ectopic pregnancy [letter]. *Fertility and Sterility* 1989; **51:** 1068.

10 Valle JA, Lifchez ZS. Reproductive outcome following conservative surgery for tubal pregnancy in women with a single fallopian tube. *Fertility and Sterility* 1983; **39:** 316.

11 Rulin MC. Is salpingostomy the surgical treatment of choice for unruptured tubal pregnancy? *Obstetrics and Gynecology* 1995; **86(6):** 1010–13.