Assessment of Ovarian Reserve after Laparoscopic Salpingectomy Versus Salpingostomy for Treatment of un disturbed Ectopic Pregnancy

Ehab Hasanein Mohamed, Abdel Moneim Mohammed Zakaria and Abdel-rahman Ragab Rashed

Obstetrics and Gynecology Department, Faculty of Medicine-Al Azhar University, Egypt.
abdelrahmanragab21@yahoo.com

Abstract: The aim of the present work was to asses the ovarian reserve after laparoscopic salpingectomy versus salpingostomy in treatment of undisturbed Tubal ectopic pregnancy and to compare the fertility outcome after laparoscopic salpingectomy or salpingostomy. 23 patients with Ectopic pregnancy underwent laparoscopic salpingectomy (group I) & 20 patients with Ectopic pregnancy underwent laparoscopic salpingostomy (group II) after conversion of 3 patients from salpingotomy to salpingectomy during the initial surgery. All patients underwent trans vaginal U/S and estimation of B-HCG titre for diagnosis of ectopic pregnancy. ovarian function was assessed by antral follicle count and ovarian volume measured by transvaginal ultrasonography & Estimation of serum FSH and LH pre operatively and post operatively. All patients suspected to have an ectopic pregnancy underwent a diagnostic laparoscopy. The decision to perform either salpingectomy or salpingostomy was left to the surgeon. After surgery, all women were informed about their study group assignment and what intervention they received. To identify persistent trophoblast, serum hCG was measured post-operatively on a weekly basis until undetectable levels were reached in both study groups. The patients were asked to visit the hospital on the 2nd to 5th days of their menstrual cycl 1st month for an initial assessment, and 6 months later following surgery during the early proliferative phase for the second evaluation of the hormonal (serum FSH & LH) & sonographic markers (OV & AFC) of ovarian reserve & fertility outcome (ongoing pregnancy by natural conception in 1st 6months after operation) & Persistent trophoblast and Repeat ectopic pregnancy. This study showed that no statistically significant difference between both groups As regard (Demographic Data) & serum LH and Ovarian volume. This study showed that statistically significant increase of serum FSH and significant reduction of AFC of operated side in post operative 6th cycle of group I in comparison with pre operative and post operative 1st cycle and in comparison with group II. The ongoing pregnancy rate by natural conception was 25% after salpingostomy and 13% after salpingectomy within the 1st 6 months after operation. Persistent trophoblast and Repeat ectopic pregnancy occurred more frequent in the salpingostomy group than in the salpingectomy group (15%) versus (0%). **Conclusion:** Laparoscopy has become the standard surgical approach for the treatment of EP Each surgery for tubal EP involves an intraoperative decision regarding the possibility of tubal preserving surgery (salpingotomy) versus salpingectomy. laparoscopic salpingostomy in treatment of tubal ectopic pregnancy does not affect ovarian function. The effect of salpingectomy on ovarian reserve and ovarian function is still acontroversial issue, and more investigations are needed. In this study we found that laparoscopic salpingotomy did not improve cumulative ongoing pregnancy rates by natural conception in women with a tubal pregnancy and a normal contralateral tube, but was associated with an increased risk of persistent trophoblast and a higher, though not statistically significant, repeat ectopic pregnancy rate. We suggest that salpingectomy should be chosen for women with a tubal pregnancy if the contraldteral tube appears healthy.

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Key words; ectopic pregnancy, ovarian reserve, salpingectomy, salpingostomy.

1. Introduction

Ectopic pregnancy is a common, gynecologic, acute abdominal condition that remains life threatening; in fact, it is the leading cause of maternal death in early pregnancy **(Agdi M et al.,2009)** To date, the incidence of ectopic pregnancy has increased from 0.5% in 1970 to 2%. **(Alkatout I et al.,2013)**

Approximately 98% of ectopic pregnancies occur in the fallopian tube **(Bouyer J et al.,2002)** More than three-quarters of women who experience ectopic pregnancy should to be treated surgically. **(Sowter MC et al., 2001)**

Currently, laparoscopic surgery is the most preferred treatment option. There are two types of surgical procedure for tubal pregnancy: radical (salpingectomy) and conservative (typically salpingotomy). In clinical practice, the choice of salpingotomy versus salpingectomy depends on many factors, including patient age, tube condition, serum

human chorionic gonadotropin (hCG) levels, and patient's future fertility desire.

The management of ectopic pregnancy has changed dramatically over the years **(Yao and Tulandi 1997).** Surgical approaches are the mainstay of treatment. However, it is important to know the impact of surgical methods on ovarian function and ovarian blood flow. Th e medial tubal artery, which originates at the same point as the medial ovarian artery, is the most important blood supply to the fallopian tubes. **Lass et al. (1998)** suggested that patients who have undergone tubal surgery may encounter deterioration. of the ovarian blood fl ow and ovarian function, reduced steroid production and impaired ovarian follicle development. Markers such as ovarian volume, antral follicle count (AFC) and ovarian stromal blood fl ow have been suggested as predictors of ovarian function **(Syrop et al. 1995; Engmann et al. 1999; Kupesic et al. 2003; Ng et al. 2005)**. There fore, the surgical treatment approach is an important consideration in women with fertility expectations. In particular, in such patients, the effects of different treatment approaches on ovarian function are controversial. surgical treatment should be performed conservatively (salpingostomy) or radically (salpingectomy) in women wishing to preserve their reproductive capacity, is subject to debate. Salpingostomy preserves the tube, but bears the risks of both persistent trophoblast and repeat ipsilateral tubal EP. Salpingectomy, avoids these risks, but leaves only one tube for reproductive capacity. This study aimed to evaluate ovarian function and fertility outcomes in Patients with tubal ectopic pregnancy treated with laparoscopic salpingostomy versus salpingectomy.

2. Patient and methods

A prospective comparative analysis involving patients with ectopic pregnancy admitted between 2015 and 2017 to our hospital (laparoscopy unit in Al-Azhar university hospitals. (El-Hussein & Sayed Galal hospitals). was carried out. The initial diagnosis of ectopic pregnancy was made through a combination of clinical examination, b-HCG assay and transvaginal ultrasonography.

The study groups was composed of patients meeting the specified criteria. (patients between the age of 15and 40 years with Un disturbed tubal pregnancy & haemodynamicaly stable & Laparoscopic healthy contralateral adenaxia).

Patients were excluded from this study if they: were haemodynamically unstable; had ruptured ectopic pregnancy; did not desire fertility; had non-tubal ectopic pregnancies; underwent salpingectomy; required MTX; patient got pregnant by ART; Patient with history of previous ovarian cystectomy; Patient known history of uterine pathology; discontinued the follow-up; and/or were less than 15 and above 40 years of age.

At the initial interviews, a detailed history was obtained of the patients' demographic parameters, including age, body mass index, obstetric history, number of living children and previous health status.

All patients underwent trans vaginal U/S and estimation of B-HCG titre for diagnosis of ectopic pregnancy.

Patients were divided in to two groups:

Group A-including patients underwent laparoscopic salpingectomy in study period which is 2 years.

Group B- including patients underwent laparoscopic salpingostomy in study period which is 2 years.

The decision to perform either salpingectomy or salpingostomy was left to the surgeon.

Before surgery, about 5cc blood sample was taken from each patient and maintained in tubes containing cloth activator material (serum separation, Deltalab Rubi, SPAIN). The samples were centrifuged with 3000 rpm and the serum was collected at 2ml microtubes and stored at -20° C freezer until subsequent analysis for estimation of serum FSH & LH & Transvaginal ultrasound were done for estimation of ovarian volum and antral follicle count pre operatively.

All patients suspected to have an ectopic pregnancy underwent a diagnostic laparoscopy. The patients were treated by laparoscopy (salpingectomy or salpingostomy) based upon the haemodynamic status of the patient, experience of the surgeon and the availability of endoscopic equipment. The details of procedure, operating time and hospital stay were noted.

All the procedures were performed under general anaesthesia.

Laparoscopic procedures were performed in the semilithotomy position. Through an intra-umbilical incision, trocar and cannula were introduced followed by introduction of a 10mm laparoscope. After confirmation of the diagnosis, 5mm punctures were made in the left and right lower quadrants using direct visualisation and transillumination to avoid the epigastric vessels. Salpingectomy was performed by stepwise desciction of the mesosalpinx with bipolar forceps, and cutting along the mesosalpinx and across the proximal tube using scissors.

For salpingostomy linear incision was given on the most prominent and distended antimesenteric border of fallopian tube with unipolar electrode knife. Products of conception were separated with fluid under pressure and sucked out. 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. 4mm 30 degree telescope (Hysteroscope) along with its sheath was introduced from side port for visualization during removal of tissue with the help of 10mm grasper introduced from umbilical port. The pelvis was copiously irrigated with saline at the end of each procedure. Postoperative b-HCG levels were noted after six weeks in those patients who had undergone conservative procedure.

i.e.salpingostomy.

After surgery, all women were informed about their study group assignment and what intervention they received. To identify persistent trophoblast, serum hCG was measured post-operatively on a weekly basis until undetectable levels were reached in both study groups. Persistent trophoblast is defined as post operative rising or plateauing serum hCG concentration.

The patients were asked to visit the hospital on the 2nd to 5th days of their menstrual cycl 1st month for an initial assessment, and 6 months later following surgery during the early proliferative phase for the second evaluation of the hormonal (serum FSH & LH) & sonographic markers (OV & AFC) of ovarian reserve & fertility outcome (ongoing pregnancy by natural conception in 1st 6months after operation) & Persistent trophoblast and Repeat ectopic pregnancy.

For the biochemical analyses, all blood samples were collected from the antecubital vein, between 08:00 and 09:00 after overnight fasting. The samples were centrifuged for 15 min at 2000 × *g*, aliquoted, and immediately frozen at −80 °C for analysis. The serum FSH & LH levels were measured by enzyme-linked immunosorbent assay (ELISA).

All ultrasonographic evaluations were performed by the same investigator with the same 7 MHz transvaginal probe to eliminate interobserver variation.

The ovarian volume was calculated with by the formula: height X length X width X 0.5233 and expressed in cm3

Antral follicles were defined as small follicles about 2–9 mm in diameter, counted in the sagittal and horizontal planes of the ovaries. All follicles 2- 9 mm in size were measured and counted in each ovary. The sum of counts was the antral follicle count

Ongoing pregnancy by natural conception. An ongoing pregnancy was defined as an intra-uterine pregnancy visible at ultrasound at a gestational age of ≥ 12 weeks with fetal cardiac activity, or a pregnancy resulting in the delivery of achild. We calculated the time to the first ongoing pregnancy in months, from the date of surgery of the tubal pregnancy to the first day of the last menstrual period before the conception leading to the ongoing pregnancy. If an ongoing pregnancy did not occur in 1st six month after operation follow up ended at the last date of contact, or at the moment when either IVF or reconstructive tubal surgery was performed.

Persistent trophoblast was defined as rising or plateauing serum hCG concentrations postoperatively necessitating systemic methotrexate treatment or surgical intervention.

Repeat ectopic pregnancy was defined as any ectopic pregnancy or a persisting pregnancy of unknown location for which surgical or medical treatment with methotrexate was installed.

Statistical analysis:

Data were analyzed using Statistical Program for Social Science (SPSS) version 20.0. Quantitative data were expressed as mean± standard deviation (SD). Qualitative data were expressed as frequency and percentage.

3. Results

23 patients with Ectopic pregnancy underwent laparoscopic salpingectomy (group I) & 20 patients with Ectopic pregnancy underwent laparoscopic salpingostomy (group II) after conversion of 3 patients from salpingotomy to salpingectomy during the initial surgery.

Mean patient age was 27.74±3.88years (range, 20-34years) in group I & 27.55±4.62 (range, 20-36years) in (group II). Mean body mass index was 24.26±4.16kg/m2 (range, 17-30) in group I & 24.80±3.93 kg/m2(range, 17-29) in (group II). Mean Pre operative serum B-HCG Titr in group I was 2640.87±532.42(Iu/L) Range (1800-3500) & 2837.50±573.97(Iu/L) Range (1450-4300) in (group II). Mean Size of ectopic mass by U/S in group I was 3.15±0.49(cm) Range (2.4-3.9) & 3.03±0.39(cm) Range (2.3-3.8) in (group II). .

This study showed that no statistically significant difference between both groups As regard (Demographic Data) **Table.1.**

This study showed that statistically significant increase of serum FSH in post operative 6th cycle of group I in comparison with pre operative serum FSH and post operative 1st cycle and statistically significant increase of serum FSH in post operative 6th cycle of group I in comparison with group II *p-value* 0.014. **Table 2.**

This study showed that no statistically significant difference between Pre operative and post operative Serum LH in both groups **Table 3.** and no statistically significant difference between Pre operative and post operative OV in both groups **Table.4.**

This study showed that statistically significant difference between Pre operative and post operative

1st cycle with post operative 6th cycle according to antral follicle count of operating side in group I as there is significant reduction of AFC in post operative 6th cycle p-value 0.039. with no statistically significant difference between both side in group II **Table 5.**

Table (1): Comparison between groups according to demographic data.

Demographic Data	Group I (Laparoscopic Salpingectomy) (N=23)	Group II (Laparoscopic Salpingostomy) (N=20)	t-test	p-value
Age (years) Mean±SD Range	 27.74±3.88 20-34	 27.55±4.62 20-36	0.021	0.885
Parity Multiparous Nulliparous	 13 (56.5%) 10 (43.5%)	 12 (60%) 8 (40%)	0.053	0.818
BMI [wt/(ht)2] Mean±SD Range	 24.26±4.16 17-30	 24.80±3.93 17-29	0.189	0.666
Pre operative serum B-HCG (Iu/L) Mean±SD Range	 2640.87±532.42 1800-3500	 2837.50±573.97 1450-4300	1.357	0.251
Size of ectopic mass by U/S (cm) Mean±SD Range	 3.15±0.49 2.4-3.9	 3.03±0.39 2.3-3.8	0.878	0.354

Table (2): Comparison between groups according to serum FSH.

Serum FSH (mIu/mL)	Group I (Laparoscopic Salpingectomy) (N=23)	Group II (Laparoscopic Salpingostomy) (N=20)	t-test	p-value
Pre operative Mean±SD Range	 6.36±1.30a 3.9-8.5	 6.35±1.43a 4.1-8.8	0.001	0.970
Post operative 1st cycle Mean±SD Range	 6.19±1.15a 4.2-7.8	 6.06±1.34a 4.2-7.9	0.114	0.737
Post operative 6th cycle Mean±SD Range	 7.03±1.14a 4.5-8.3	 5.69±1.44a 3.9-7.5	6.985	0.014

Table (3): Comparison between groups according to serum LH

Serum LH (mIu/mL)	Group I (Laparoscopic Salpingectomy) (N=23)	Group II (Laparoscopic Salpingostomy) (N=20)	t-test	p-value
Pre operative Mean±SD Range	 5.43±1.28a 3.4-7.3	 5.30±1.07a 3.5-6.9	0.129	0.722
Post operative 1st cycle Mean±SD Range	 4.89±1.25a 2.9-6.9	 4.99±0.84a 3.7-6.5	0.089	0.767
Post operative 6th cycle Mean±SD Range	 5.47±1.17a 3.5-6.8	 5.01±0.99a 3.5-6.6	0.941	0.341

Table (4): Comparison between groups according to ovarian volume.

Ovarian volume (cm3)	Group I (Laparoscopic Salpingectomy) (N=23)	Group II (Laparoscopic Salpingostomy) (N=20)	t-test	p-value
Pre operative				
Operating side Mean±SD Range	6.35±0.90 4.7-8.1	6.27±0.75 4.5-7.2	0.093	0.762
Non operating Mean±SD Range	5.82±0.80 4.5-7.5	5.65±0.75 4.5-6.9	0.548	0.463
Post operative 1st cycle				
Operating side Mean±SD Range	6.18±0.85 4.8-7.9	5.97±0.75 5.2-7.5	0.634	0.431
Non operating Mean±SD Range	6.07±1.11 4-8.1	6.27±0.80 4.9-8.1	0.337	0.565
Post operative 6th cycle				
Operating side Mean±SD Range	5.93±0.83 4.9-7.5	5.99±0.38 5.5-6.5	0.040	0.844
Non operating Mean±SD Range	6.14±0.70 5.1-7.9	5.94±0.99 5.1-7.9	0.358	0.555

Table (5): Comparison between groups according to antral follicle count.

Antral follicle count	Group I (Laparoscopic Salpingectomy) (N=23)	Group II (Laparoscopic Salpingostomy) (N=20)	t-test	p-value
Pre operative				
Operating side Mean±SD Range	7.52±2.06 4-12	6.95±1.54 4-10	1.010	0.321
Non operating Mean±SD Range	7.86±1.04 6-10	7.15±0.93 6-9	5.452	0.025
Post operative 1st cycle				
Operating side Mean±SD Range	7.68±1.70 4-11	6.56±1.71 4-9	3.990	0.053
Non operating Mean±SD Range	7.14±1.70 4-10	6.69±1.08 5-8	0.861	0.360
Post operative 6th cycle				
Operating side Mean±SD Range	5.60±1.64 4-9	6.22±1.20 4-8	4.763	0.039
Non operating Mean±SD Range	5.90±1.41 4-9	5.78±0.83 5-7	0.058	0.812

Table (6): Comparison between groups according to on going preg.

On going preg.	Group I (Laparoscopic Salpingectomy) (N=23)		Group II (Laparoscopic Salpingostomy) (N=20)		Chi-square test	
	No.	%	No.	%	x2	p-value
Yes	3	13%	5	25%	3.221	0.078
No	20	87%	15	75%		

Table (7): Comparison between groups according to persistent trophoblast, ipislateral and contralateral.

	Group I (Laparoscopic Salpingectomy) (N=23)		Group II (Laparoscopic Salpingostomy) (N=20)		Chi-square test	
	No.	%	No.	%	x2	p-value
Persistent trophoblast	0	0.0%	3	15.0%	3.890	0.216
Repeated Ectopic	0	0.0%	3	15.0%	3.890	0.216

This study showed that no statistically significant difference between both groups as regard on going pregnancy by natural conception in 1st six months after operation about 13% in Group I (Laparoscopic Salpingectomy) & 25% in Group II (Laparoscopic Salpingostomy) p-value 0.078 **Table 6.**

Table (7) show that Persistent trophoblast occurred more often in the salpingostomy (15.0%) group than in the salpingectomy group (0%) **p-value** 0.216. The 6-months cumulative recurrent EP rates were found to be 15.0%for salpingostomy, 0% for salpingectomy group. **p-value** 0.216.

4. Discussion

Theoretically, a surgical approach to the fallopian tubes can affect ovarian arterial supply, which can in turn disrupt normal steroidal production and follicular development **(Chan et al. 2003).** Adequate ovarian blood flow, providing normal ovarian function and follicle development, is necessary for the transportation of the paracrine and endocrine factors. Changes in the ovarian blood flow and ovarian functions after the treatment of ectopic pregnancy have not yet been clearly elucidated The majority of studies that have investigated the impact of salpingectomy on ovarian function are related to patients with hydrosalpinx before the *in vitro* fertilisation cycle. **Almog et al. (2011)** evaluated the cycle characteristics of patients who underwent salpingectomy for ectopic pregnancy or hydrosalpinx they reported that salpingectomy did not affect ovarian response in controlled ovarian hyperstimulation.

. **Lass et al. (1998)** found that salpingectomy had no adverse effect on the outcome of IVF embryo transfer (ET), but the number of oocytes on the operated side had reduced. **Chan et al. (2003)** evaluated the effect of salpingectomy on ovarian function in patients who were treated by laparoscopy or laparotomy for ectopic pregnancy, and they reported that the operated side showed significantly decreased AFC and impaired ovarian blood flow in the laparoscopy group but not in the laparotomy group.

Goynumer et al. (2009) evaluated the effects on ovarian reserve in patients who underwent tubal sterilization via electrocoagulation and mechanical clips. The FSH, LH, oestradiol, inhibin B and anti-Müllerian hormone (AMH) levels; ovarian volume and AFC at the preoperative measurement and at 10 months postoperatively were compared. The AFC and ovarian volume had significantly decreased at 10 months postoperatively in the electrocoagulation group.

Our study showed that no statistically significant difference between Pre operative and post operative Serum FSH & LH level in group II **&** no statistically significant difference between operating and non operating side as regard Ovarian volume in salpingostomy group & no statistically significant difference between operating and non operating side as regard AFC compared between the preoperative and postoperative values in salpingostomy group.

These results are consistent with the study performed by **U. Keskin., et al 2013** who found that no significant differences were found in the AFC ovarian volume compared between the preoperative and postoperative values of the study group (obtained 3 or 4 months after the surgery).

In salpingectomy, tubal and ovarian branches of uterine arteries are often excised alongside the mesosalpynx and, hence, it is believed that disruption to blood supply to ovaries may lead to reduction of ovarian reserve.

Oybek Rustamov (2016) show that no appreciable association between salpingectomy and any of the biomarkers of ovarian reserve suggesting this surgery does not affect ovarian reserve. These findings are supported by a longitudinal study that

assessed the effect of tubal dissection to AMH, AFC and FSH.

Ercan CM et al., (2013). There were no differences between preoperative and 3- month postoperative measurements with median AMH (1.5vs. 1.4; p = 0.07), AFC (8.4 ± 3.7 vs. 7.9 ± 4.1; p = 0.09), FSH (7.6 ± 2.1 vs. 7.7 ± 2.1; p = 0.10).

Our study show that significant reduction in AFC in post operative 6th cycle in salpingectomy group**.** and also significant increase in serum FSH level in post operative 6th cycle in salpingectomy group. in comparison with pre operative serum FSH and post operative 1st cycle *p-value* 0.035 but with in normal range.

These results are consistent with the study performed by **C.C.W. Chan et al.** who found that Evaluation of ovarian stromal blood flow using 3D power Doppler ultrasonography in patients who had had unilateral salpingectomy for >3 months. Two other markers of ovarian function, the antral follicle count and the ovarian volume, were evaluated at the same time. There was no difference in all these markers on the ipsilateral side of salpingectomy when compared to the non-operated side. However, when only those with laparoscopic salpingectomy were analysed, the antral follicle count and the ovarian blood flow were significantly reduced. Our findings were in fact similar to those of **Sumiala et al. (1995).**

In this study we found that salpingotomy did not improve cumulative ongoing pregnancy rates by natural conception in women with a tubal pregnancy and a normal contralateral tube, but was associated with an increased risk of persistent trophoblast and a higher though not statistically significant, repeat ectopic pregnancy rate.

Our study showed that no statistically significant difference between both groups as regard on going pregnancy by natural conception in 1st six months after operation about 13% in Group I (Laparoscopic Salpingectomy) & 25% in Group II (Laparoscopic Salpingostomy) p-value 0.078.

Our study shows that Persistent trophoblast occurred more often in the salpingostomy (15.0%) group than in the salpingectomy group (0%) **p-value** 0.216. The 6-months cumulative recurrent EP rates were found to be 15.0%for salpingostomy, 0% for salpingectomy group. **p-value** 0.216.

These results are consistent with the study performed by **F. Mol 2013 (ESEP trial):** This ESEP trial is the largest study to date that compares salpingotomy with salpingectomy in women with a normal contralateral tube. **The cumulative ongoing pregnancy** rate by natural conception was 60.7% after salpingotomy and 56.2% after salpingectomy within a time horizon of 36 months, **Persistent trophoblast** occurred more frequent in the salpingotomy group than in the salpingectomy group (14 (6.5%) versus1(0.4%). **Repeat ectopic pregnancy** occurred in 18 women (8.4%) in the salpingotomy group versus 12 (5.2%) in the salpingectomy group.

Recently, another randomised controlled trial performed by **(Fernandez H et al.,2013) (DEMETER**) was published with a similar result on cumulative ongoing pregnancy rates. A meta-analysis of this trial including 649 women showed no significant difference in cumulative ongoing pregnancy rates between salpingostomy and salpingectomy with higher rate of Repeat ectopic pregnancy, Persistent trophoblast after salpingostomy.

De Bennetot et al. analyzed 1,064 patients with ectopic pregnancy in a prospective, population based-study. The crude 2-year cumulative rate of IUP was lower after a radical treatment (67%) compared with a conservative treatment (76%). However, a univariate analysis indicated that the pregnancy rate in the radical surgery group was lower than that in the conservative surgery group.

Bangsgaard et al. The cumulative intrauterine pregnancy rate was significantly higher after slpingostomy (88%) than after salpingectomy (66%). No difference was found in the recurrence rate of ectopic pregnancy between the treatments (16% vs 17%). The rate of persistent ectopic pregnancy was 8%.

Our results warrant the conclusion that salpingectomy is the preferred treatment in terms of efficacy. This conclusion is supported by the results of a previous patient preference study that showed a strong preference of women towards salpingectomy **(van Mello et al., 2010).** Instead of future pregnancy prospects being the most important decisive factor, women preferred to reduce the risk of repeat ectopic pregnancy. the surgical treatment of choice in women with a tubal pregnancy and a normal contralateral tube is salpingectomy.

In conclusion, The effect of salpingectomy on ovarian reserve and ovarian function is still a controversial issue, and more investigations are needed. during the operation, care should be undertaken not to disrupt the blood vessels in the mesosalpinx as far as possible. laparoscopic salpingostomy does not affect ovarian function. Further studies are required to determine the impact of laparoscopic salpingostomy on ovarian function.

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