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Therapeutic effect of laparoscopic salpingotomy vs. salpingectomy on patients with ectopic pregnancy: A systematic review and meta-analysis

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Background and aim: Laparoscopic treatment of ectopic pregnancy mainly includes laparoscopic salpingotomy and salpingectomy. We aimed to assess the therapeutic effect of laparoscopic salpingotomy and salpingectomy on patients with tubal pregnancy.

Methods: From January 2000 through June 2022, the Cochrane Library, Medline, PubMed, Web of Science, EMBASE, and the Chinese Biomedicine Database were searched for studies that compared the therapeutic effect of laparoscopic salpingotomy vs. salpingectomy in the treatment of tubal pregnancy.

Results: Twenty-four randomized clinical trials (RCTs) studies were incorporated into this analysis. No statistical differences were found between the two groups in terms of operation duration and postoperative hospitalize length, but the volume of intraoperative blood loss in patients with laparoscopic salpingotomy was less than that in salpingectomy. Importantly, the natural intrauterine pregnancy rate after laparoscopic salpingotomy was significantly higher than those who underwent salpingectomy. In addition, laparoscopic salpingotomy can better protect the ovarian reserve function and endocrine function and provide favorable conditions for the second pregnancy.

Conclusion: Patients with ectopic tubal pregnancy should give priority to laparoscopic salpingotomy for embryo extraction.

KEYWORDS

tubal pregnancy, salpingotomy, salpingectomy, meta-analysis, RCT (randomised controlled trial)

Introduction

Ectopic pregnancy refers to the implantation of fertilized eggs outside the normal site and is one of the common gynecological diseases (1). The fallopian tube is the most common site of ectopic pregnancy (about 95%) (2). If the patient does not receive treatment in time, once the fallopian tube ruptures due to embryonic development, it can lead to massive bleeding in the abdominal cavity of the patient and, in serious cases, can endanger the life of the patient. For patients with ectopic pregnancy, the embryo must be removed from the fallopian tube to terminate the pregnancy. At present, surgery is the most effective way to treat ectopic pregnancy (3-5).

Laparoscopic fallopian tube surgery only has small trauma and rapid postoperative recovery; hence, it should be the first choice for the treatment of fallopian tube pregnancy (6-8). Laparoscopic treatment of ectopic pregnancy mainly includes laparoscopic salpingotomy and salpingectomy. Although both methods have good curative effects, the effects of different surgical methods on the postoperative reproductive function of patients have not yielded a consistent conclusion. Fernandez et al. (9) found that the two-year intrauterine pregnancy rate in the salpingotomy group was significantly higher than that in the salpingectomy group and believed that salpingotomy had a greater advantage in the postoperative intrauterine pregnancy rate. On the contrary, Mol et al. (10) conducted a multicenter, randomized controlled study and found no significant difference in the postoperative intrauterine pregnancy rate and the re-ectopic pregnancy rate between the two groups. Besides, there have been relatively few clinical studies on the effects of different laparoscopic methods for surgical treatment of tubal pregnancy on ovarian blood supply and ovarian reserve function, and the effects of the two surgical methods on patients' postoperative ovarian reserve function are still controversial.

With the emergence of new clinical research evidence in recent years, we conducted a meta-analysis to study the therapeutic effect of salpingotomy and salpingectomy on patients with tubal pregnancy. The perioperative safety, postoperative natural intrauterine pregnancy rate, ectopic pregnancy rate of the two surgical methods, and the effects of the two surgical methods on the ovarian reserve function of patients were compared.

Methods

Search strategies

From January 2000 through June 2022, the Cochrane Library, Medline, PubMed, Web of Science, EMBASE, and the Chinese Biomedicine Database were searched. Our subject-related searches comprised both free and MESH terms without language constraints. The following keywords were used in the search: ("tubal pregnancy" OR "ectopic pregnancy" OR "tubal ectopic pregnancy" OR "tubal gestation" OR "tubal ectopic pregnancy") AND ("conservative surgery" OR "conservative procedure" OR "salpingotomy" OR "salpingotomy") AND ("salpingectomy" OR "tubal excision" OR "tubectomy" OR "radical surgery" OR "radical procedure") NOT "animals." Two independent researchers used these keywords to search for titles, abstracts, and medical subject headings. The consensus was developed between the

two researchers to make a final determination on the eligibility of the article for inclusion. When no consensus could be established, a third researcher made the ultimate decision. The outcomes of the investigated search approach are displayed as a flow diagram (Figure 1). Since the analysis was based on studies that were previously published, neither ethical approval nor patient permission was necessary.

Inclusion and exclusion criteria

The studies included in this analysis were chosen based on the following criteria: (1) Studies including comparisons of groups of patients who underwent salpingectomy against salpingostomy; (2) Pregnancies resulting from *in vitro* fertilization were likewise excluded from all included studies; (3) If the same data had been published many times, only the most recent report was considered; (4) Only studies with at least one significant study result were considered for inclusion; (5) Only studies for which full-text access was accessible were considered; (6) RCT studies.

The studies listed below were eliminated from consideration in this study. (1) Studies that did not mention in detail the type of surgery that was performed; (2) Studies that do not have data readily available for extraction; (3) Analyses of non-tubal ectopic pregnancies; (4) Not RCT studies. (5) Studies are categorized as abstracts, case reports, reviews, letters, comments, animal studies or investigations with insufficient data.

Data extraction and definition

The following outcome indices were used: (1) the volume of bleeding during operation; (2) operation duration; (3) postoperative hospitalize length; (4) HCG level: Serum HCG level was detected 12 h after the operation. (5). About 93% of second pregnancies occurred about 18 months after the operation (11), and only the data of second pregnancies from included literature with more than 18 months were analyzed. Intrauterine pregnancy: spontaneous intrauterine pregnancy during postoperative follow-up, including full-term delivery and spontaneous intrauterine pregnancy abortion. Ectopic pregnancy: ectopic pregnancy in any part that occurs again during postoperative follow-up. (6) Serum ovarian hormone level: The level of FSH (follicle-stimulating hormone), LH (luteinizing hormone), E2 (estradiol), T (testosterone) and P (progesterone) were detected 6 months after operation; (7). Ultrasound examination: EDV (end-diastolic velocity), PSV (peak systolic velocity), RI (resistance index), numbers of follicles, and cross-sectional area of the affected ovary were examined by ultrasound 6 months after the operation.



Assessing the quality and the bias risk of included RCTs

The methodological quality was assessed employing the modified Jadad scoring system. The risk of bias in the considered RCTs was assessed using the quality criteria recommended by the Cochrane Handbook (Figure 2).

Statistical analysis

The Review Manager software was utilized to conduct metaanalyses. Both continuous and categorical variables were evaluated using weighted mean differences (WMDs) and odds ratios (ORs) with corresponding 95% CIs. Chi-squared, Mantel-Hansel, and I^2 tests were employed to analyze to examine study heterogeneity. In instances where I^2 was greater than or equal to 50%, a random-effects model was utilized, while if I^2 less than 50%, a fixed-effects model was utilized. The funnel plot was applied to assess the publication bias. Differences with p < 0.05 were considered statistically significant.

Results

Quality and characteristics of the included RCT studies

This meta-analysis comprised a total of twenty-four RCTs. There were a total of 2,354 patients involved in the study,



FIGURE 2

Risk of bias: "+" and "?" indicated the low risk and unclear risk of bias, respectively.

with 1,171 patients assigned to the salpingotomy group and 1,183 patients assigned to the salpingectomy group. Table 1 summarizes the parameters of the investigations that were incorporated into the meta-analysis. We determined the scores for each of the examined studies. The scores ranged from 4 to 7, suggesting that the included RCT studies were of good quality (Table 2).

Meta-analysis of perioperative safety

Operating duration

Operation duration was reported by nine of the included studies. The results of the meta-analysis, which used a random model ($I^2 = 98\%$), showed that there was no marked difference between two groups (WMD = -1.73; 95%CI, -6.10-2.65; p = 0.44) (Figure 3A).

Volume of bleeding during operation

Eleven included studies reported the volume of bleeding during operation. The results of the meta-analysis, which used a random model ($I^2 = 99\%$), showed that the volume of bleeding was significantly less in salpingotomy group (WMD = -164.86; 95%CI, -195.3-134.34; p < 0.00001) (Figure 3B).

Postoperative hospitalize length

Postoperative hospitalize length was reported by eight of the included studies. The results of the meta-analysis, which used a random model ($I^2 = 88\%$), showed that there was no distinct difference between two groups (WMD = -0.39; 95%CI, -1.00-0.23; p = 0.22) (Figure 3C).

Postoperative hCG level

Postoperative hCG level was reported by seven of the included studies. The results of the meta-analysis, which used a random model ($I^2 = 99\%$), showed that there was no distinct difference between two groups (WMD = -4.88; 95%CI, -14.43-4.68; p = 0.32) (Figure 3D).

Meta-analysis of reproductive outcome after operation

Postoperative intrauterine pregnancy rate

Fifteen included studies reported the intrauterine pregnancy rate. The results of the meta-analysis, which used a random model ($I^2 = 75\%$), showed that intrauterine pregnancy rate was significantly higher in salpingotomy group (OR = 2.49; 95%CI, 1.61–3.86; p < 0.0001) (Figure 4A).

Postoperative ectopic pregnancy rate

Fourteen included studies reported the ectopic pregnancy rate. The results of the meta-analysis, which used a random

Author	Year	Country	Group	Ν	Age, y	Outcome
Xie et al. (12)	2012	China	Salpingotomy Salpingectomy	20 20	20–40 20–40	6,7
Fernandez et al. (9)	2013	Europe	Salpingotomy Salpingectomy	101 98	29.28 (Mean) 31.25 (Mean)	5
Zhu et al. (13)	2013	China	Salpingotomy Salpingectomy	20 20	25–35 25–35	6,7
Mol et al. (10)	2014	France	Salpingotomy Salpingectomy	215 231	30.9 ± 5.5 30.9 ± 5.5	5
Yang et al. (14)	2015	China	Salpingotomy Salpingectomy	34 34	21–37 21–37	6
Zhang et al. (15)	2015	China	Salpingotomy Salpingectomy	30 30	29.0 ± 2.2 32.0 ± 2.4	1,2,3,5,7
Sun et al. (16)	2016	China	Salpingotomy Salpingectomy	50 50	26.21 ± 3.26 27.05 ± 3.12	1,2,3,4,5
Huang et al. (17)	2016	China	Salpingotomy Salpingectomy	35 35	27.5 ± 5.0 26.1 ± 5.4	1,2,3,4,5
Zhong et al. (18)	2017	China	Salpingotomy Salpingectomy	42 42	27.49 ± 3.19 27.75 ± 3.21	1,2,3,4,5
Shan et al. (19)	2017	China	Salpingotomy Salpingectomy	30 30	27.6 ± 6.3 26.7 ± 6.9	6,7
Gong et al. (20)	2017	China	Salpingotomy Salpingectomy	36 36	35.7 ± 3.3 37.1 ± 4.9	1,2,3,4
Liao et al. (21)	2017	China	Salpingotomy Salpingectomy	25 25	28.0 ± 5.0 29.5 ± 5.5	6,7
Liu et al. (22)	2017	China	Salpingotomy Salpingectomy	50 50	28.2 ± 3.4 27.9 ± 3.6	1,2,3,4,5
Shi et al. (23)	2018	China	Salpingotomy Salpingectomy	40 40	28.7 ± 3.4 28.3 ± 3.6	5,6,7
Wu et al. (24)	2018	China	Salpingotomy Salpingectomy	30 30	20–40 20–40	6
Wang et al. (25)	2018	China	Salpingotomy Salpingectomy	60 60	29.87 ± 4.56 28.47 ± 4.38	5
Yan et al. (26)	2018	China	Salpingotomy Salpingectomy	40 40	29.54 ± 3.74 29.57 ± 3.80	1,2,5
Zhang et al. (27)	2018	China	Salpingotomy Salpingectomy	38 38	28.48 (Mean) 28.37 (Mean)	1,2,3,4,5
Zhou et al. (28)	2018	China	Salpingotomy Salpingectomy	53 53	27.83 ± 1.16 27.83 ± 1.16	5
Yue et al. (29)	2019	China	Salpingotomy Salpingectomy	40 39	28.27 ± 4.43 29.49 ± 5.13	5,6
Zhou et al. (30)	2019	China	Salpingotomy Salpingectomy	30 30	29.47 ± 4.35 28.86 ± 4.15	5,6,7
Wei et al. (31)	2020	China	Salpingotomy Salpingectomy	54 54	29.54 ± 2.36 28.43 ± 3.21	1,2,3,5
Wang et al. (32)	2020	China	Salpingotomy Salpingectomy	40 40	25.84 ± 3.11 26.78 ± 3.58	2,4,5
Bian et al. (33)	2020	China	Salpingotomy Salpingectomy	58 58	28.75 ± 4.2 27.9 ± 4.55	2,5

TABLE 1 Main characteristics of all the included RCT studies.

Outcome: 1: Time of operation; 2: intraoperative blood loss; 3: postoperative hospital stay; 4: HCG level; 5: Intrauterine pregnancy and ectopic pregnancy; 6: Serum ovarian hormone level; 7: Ultrasound examination.

TABLE 2 Modified Jadad scale syster	n for randomized controlled trials.
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Refs	Α	В	С	D	Ε
Xie et al. (12)	2	1	1	0	4
Fernandez et al. (9)	2	2	2	1	7
Zhu et al. (13)	2	1	1	0	4
Mol et al. (10)	2	2	2	1	7
Yang et al. (14)	2	2	1	0	5
Zhang et al. (15)	2	1	1	0	4
Sun et al. (16)	2	1	1	0	4
Huang et al. (17)	2	2	1	0	5
Zhong et al. (18)	2	2	1	1	6
Shan et al. (19)	2	2	1	1	6
Gong et al. (20)	2	2	1	1	6
Liao et al. (21)	2	2	1	0	5
Liu et al. (22)	2	2	0	0	4
Shi et al. (23)	2	2	1	0	5
Wu et al. (24)	2	2	0	0	4
Wang et al. (25)	2	2	0	0	4
Yan et al. (26)	2	2	1	0	5
Zhang et al. (27)	2	2	1	1	6
Zhou et al. (28)	2	2	1	0	5
Yue et al. (29)	2	2	0	0	4
Zhou et al. (30)	2	2	1	0	5
Wei et al. (31)	2	2	1	1	6
Wang et al. (32)	2	2	0	0	4
Bian et al. (33)	2	2	1	1	6

1. Modified Jadad scale system: The system was used to assess randomization, concealment of allocation, blinding, and withdrawals in the study. Each item was given a score of 0–2 and 7 score in total. If the total score was \geq 4, the RCT was of high quality.

2. A: Randomization; B: Concealment of allocation; C: Double blinding; D: Withdrawals and drop out; E: Total Score.

model ($I^2 = 63\%$), showed that there was no marked difference between two groups (OR = 1.15; 95%CI, 0.64–2.07; p = 0.64) (Figure 4B).

Meta-analysis of ovarian function after the operation

Serum ovarian hormone level

The values of FSH (WMD = -2.22; 95%CI, -2.8-1.61; p < 0.00001) and LH (WMD = -0.97; 95%CI, -1.7-0.23; p = 0.01) was significantly higher in salpingectomy group. The values of E2 (WMD = 11.58; 95%CI, 2.96-20.20; p = 0.008), T (WMD = 0.14; 95%CI, 0.11-0.17; p < 0.00001) and P (WMD = 0.68; 95%CI, 0.59-0.77; p < 0.00001) was significantly higher in salpingotomy group (Figures 5A–E).

Ultrasound examination of the affected ovary

The numbers of follicles (WMD = 3.84; 95%CI, 3.49–4.20; p < 0.00001), cross-sectional area (WMD = 1.82; 95%CI, 1.43–2.22; p < 0.00001), PSV (WMD = 1.67; 95%CI, 1.46–1.89; p < 0.00001) and EDV (WMD = 1.59; 95%CI, 1.38–1.79; p < 0.00001) was significantly higher in salpingotomy group. The values of RI (WMD = -0.10; 95%CI, -0.1–0.05; p < 0.0001) was significantly higher in salpingectomy group (Figures 6A–E).

Meta-analysis of subgroups

At present, whether to suture the tubal after salpingotomy is a controversial clinical issue. In order to clarify whether this factor will affect the results of this meta-analysis, we conducted a subgroup analysis according to with or without suturing. The analysis results were shown in Table 3. Consistently, the results of our subgroup analysis suggested that the postoperative intrauterine pregnancy rate of salpingotomy group is significantly higher than that of the salpingectomy group, regardless of whether with suturing (OR = 4.56, p < 0.00001) or not (OR = 1.42, p = 0.003). Interestingly, patients with salpingotomy combined with suture showed a significantly lower ectopic pregnancy rate than that of patients with salpingectomy (OR = 2.61, p = 0.007). however, salpingotomy without suture did not show this advantage (OR = 2.14, p = 0.17). Further analysis found that salpingotomy combined with suture had higher intrauterine pregnancy rate (64% vs. 49%) and lower extrauterine pregnancy rate (7% vs. 22%) than that of salpingotomy without suture (Figure 7).

Publication bias

Figure 8 demonstrates that the funnel plots have no discernible asymmetry, which indicating a low probability of publication bias.

Discussion

With the development and improvement in laparoscopic technology, the advantages of laparoscopic surgery in the treatment of tubal pregnancy are being clinically recognized. The incidence of tubal pregnancy is gradually increasing, and the number of patients with reproductive requirements is also increasing. Therefore, protecting the reproductive function of patients after treatment has become a clinical hot spot. Laparoscopic salpingotomy and salpingectomy are common methods for the treatment of ectopic pregnancy. Nonetheless, perioperative safety, postoperative fertility, and the impact on ovarian reserve function of the two surgical methods are still controversial.

•					Salai	nonton	337		Mean Difference	Moon Difference
	Study or Subgroup	Moan	SD	Total	Moan	SD	iy Total	Noight	IV Pandom 95% CI Vear	Wear Difference
	Wei XT 2020	/1 80	5 75	54	63 21	6 1 1	54	11 3%	21 32 [-23 56 -19 08] 2020	
	Ver XI 2020	63 74	9.58	40	65 14	10.26	40	10.4%	-1 40 [-5 75 2 95] 2018	
	Zhang YL 2018	50.07	4.8	38	49.42	4.43	38	11.3%	0.65 [-1.43, 2.73] 2018	
	Gong CJ 2017	48.75	3.68	36	49.04	3.52	36	11.4%	-0.29 [-1.95, 1.37] 2017	
	Liu XM 2017	47.6	3.2	50	48.1	3.4	50	11.5%	-0.50 [-1.79, 0.79] 2017	
	Zhong YP 2017	49.53	4.47	42	50.42	4.78	42	11.3%	-0.89 [-2.87, 1.09] 2017	
	Huang YQ 2016	49.5	4.4	35	50.4	4.8	35	11.3%	-0.90 [-3.06, 1.26] 2016	
	Sun M 2016	49.5	4.2	50	49.6	4.1	50	11.4%	-0.10 [-1.73, 1.53] 2016	
	Zhang Y 2015	49.1	9.3	30	38.7	10.4	30	10.1%	10.40 [5.41, 15.39] 2015	
	9									
	Total (95% CI)			375			375	100.0%	-1.73 [-6.10, 2.65]	
	Heterogeneity: Tau ² = Test for overall effect:	: 42.93; (Z = 0.77	Chi² = 33 ′ (P = 0.	33.02, 44)	df = 8 (P	< 0.000	01); l²	= 98%	_	-10 -5 0 5 10 Favours [Salpingotomy] Favours [Salpingectomy]
	94. d 0. k	Salpi	ngotom	у Т-4-1	Salp	ngector	ny	14/-1-64	Mean Difference	Mean Difference
-	Study or Subgroup	Mean	109.24	Iotal	Mean	470.20		2 20/	IV. Random, 95% CI Year	IV, Random, 95% CI
	Rian XY 2020	823 64	42.0	40	980 11	51 67	40	3.3%	-035.12 [-140.03, -449.05] 2020	
	Wei XT 2020	41 15	42.9	54	66.40	10.04	54	16.0%	-25.34 [-28.89 -21.79] 2020	
	Zhang YL 2018	97.74	104.17	38	125.72	172.70	38	9.4%	-27.98 [-92.13 36.17] 2018	-+
	Yan XL 2018	874.65	95.47	40	985.64	100.25	5 40	12.2%	-110.99 [-153.89, -68.09] 2018	-
	Zhong YP 2017	982.47	112.57	42	1,551.34	480.31	42	3.3%	-568.87 [-718.07, -419.67] 2017	
	Gong CJ 2017	977.33	111.44	36	1,322.88	311.01	36	5.3%	-345.55 [-453.47, -237.63] 2017	
	Liu XM 2017	977.7	57.6	50	1,321.4	124	50	12.8%	-343.70 [-381.60, -305.80] 2017	_ *
	Sun M 2016	980.2	112.2	50	1,289.2	489.8	50	3.7%	-309.00 [-448.28, -169.72] 2016	
	Huang YQ 2016	981.8	112.6	35	1,250.6	481.3	35	2.9%	-268.80 [-432.56, -105.04] 2016	
	Zhang Y 2015	51.1	2.1	30	55.3	1.6	30	16.0%	-4.20 [-5.14, -3.26] 2015	1
	Total (95% CI)			473			473	100.0%	-164 86 [-195 37 -134 34]	•
	Heterogeneity: Tau ² = 1	515 77. (Chi ² = 92	28 17 d	f = 10 (P	< 0.000)1)· 2 =	99%	104.00 [100.01, 104.04]	· · · · · · · · · · · · · · · · · · ·
	Test for overall effect: 7	r = 10.59	(P < 0.0)	0001)	1 - 10 (1	0.000	,,,,	0070		-1000 -500 0 500 10
_	Study or Subgroup Wei XT 2020	Salı <u>Mean</u> 5.27	0.92	my Total 54	Salpi Mean 7.13	ngecto SD 1.03	my <u>Total</u> 54	Weight 14.0%	Mean Difference <u>IV. Random, 95% CI Year</u> -1.86 [-2.23, -1.49] 2020	Mean Difference IV. Random. 95% Cl
_	Study or Subgroup Wei XT 2020 Zhang YL 2018	Salı <u>Mean</u> 5.27 5.32	0.92 2.01	my <u>Total</u> 54 38	Salpi Mean 7.13 5.24	ngecto SD 1.03 1.88	my <u>Total</u> 54 38	Weight 14.0% 11.4%	Mean Difference IV. Random, 95% CI Year -1.86 [-2.23, -1.49] 2020 0.08 [-0.80, 0.96] 2018 0.10 [-0.80, 0.96] 2017	Mean Difference IV. Random. 95% Cl
_	Study or Subgroup Wei XT 2020 Zhang YL 2018 Zhong YP 2017 Liu XM 2017	Salj <u>Mean</u> 5.27 5.32 5.1	0.92 2.01 1.4	my <u>Total</u> 54 38 50	Salpi <u>Mean</u> 7.13 5.24 5.2	ngecto SD 1.03 1.88 1.6 2.11	my <u>Total</u> 54 38 50	Weight 14.0% 11.4% 13.0%	Mean Difference <u>IV. Random, 95% CI Year</u> -1.86 [-2.23, -1.49] 2020 0.08 [-0.80, 0.96] 2018 -0.10 [-0.69, 0.49] 2017 0.13 (-0.40, 0.78) 2017	Mean Difference IV. Random. 95% Cl
_	Study or Subgroup Wei XT 2020 Zhang YL 2018 Zhong YP 2017 Liu XM 2017 Careo C 1 2017	Salj <u>Mean</u> 5.27 5.32 5.1 5.16	0.92 2.01 1.4 2.14	my <u>Total</u> 54 38 50 42	Salpi Mean 7.13 5.24 5.2 5.29	ngecto SD 1.03 1.88 1.6 2.11	my <u>Total</u> 54 38 50 42 26	Weight 14.0% 11.4% 13.0% 11.2%	Mean Difference IV. Random, 95% CI Year -1.86 [-2.23, -1.49] 2020 0.08 [-0.80, 0.96] 2018 -0.10 [-0.69, 0.49] 2017 -0.13 [-1.04, 0.78] 2017 -0.98 [-0.27, 0.71] 2017	Mean Difference IV. Random. 95% Cl
_	Study or Subgroup Wei XT 2020 Zhang YL 2018 Zhong YP 2017 Liu XM 2017 Gong CJ 2017 Sung XJ 2016	Salj <u>Mean</u> 5.27 5.32 5.1 5.16 5.12	0.92 2.01 1.4 2.14 1.83	Total 54 38 50 42 36	Salpi Mean 7.13 5.24 5.2 5.29 5.2	ngecto SD 1.03 1.88 1.6 2.11 1.6 1.1	my 54 38 50 42 36	Weight 14.0% 11.4% 13.0% 11.2% 11.9% 12.7%	Mean Difference IV. Random, 95% CI Year -1.86 [-2.23, -1.49] 2020 0.08 [-0.80, 0.69] 2018 -0.10 [-0.60, 0.49] 2017 -0.13 [-1.04, 0.78] 2017 -0.08 [-0.87, 0.71] 2017 -0.08 [-0.87, 0.71] 2016	Mean Difference IV. Random, 95% Cl
_	Study or Subgroup Wei XT 2020 Zhang YL 2018 Zhong YP 2017 Liu XM 2017 Gong CJ 2017 Sun M 2016 Hunga YC 2016	Salj Mean 5.27 5.32 5.1 5.16 5.12 5	0.92 2.01 1.4 2.14 1.83 1.2	Total 54 38 50 42 36 50	Salpi Mean 7.13 5.24 5.2 5.29 5.2 5.2 5.2	ngecto SD 1.03 1.88 1.6 2.11 1.6 1.1	my <u>Total</u> 54 38 50 42 36 50 25	Weight 14.0% 11.4% 13.0% 11.2% 11.9% 13.7%	Mean Difference IV. Random, 95% CI Year -1.86 [-2.23, -1.49] 2020 0.08 [-0.80, 0.96] 2018 -0.10 [-0.69, 0.49] 2017 -0.13 [-1.04, 0.78] 2017 -0.08 [-0.87, 0.71] 2017 0.00 [-0.45, 0.45] 2016 0.20 [-41, 0.71] 2016	Mean Difference IV. Random. 95% Cl
	Study or Subgroup Wei XT 2020 Zhang YL 2018 Zhong YP 2017 Liu XM 2017 Gong CJ 2017 Sun M 2016 Huang YQ 2016 Zhang Y 2015	Salı Mean 5.27 5.32 5.1 5.16 5.12 5 5.1	Dingota SD 0.92 2.01 1.4 2.14 1.83 1.2 1.9	Total 54 38 50 42 36 50 35	Salpi Mean 7.13 5.24 5.2 5.29 5.2 5.2 5.3 3.9 f	ngecto SD 1.03 1.88 1.6 2.11 1.6 1.1 2 0 87	my 54 38 50 42 36 50 35	Weight 14.0% 11.4% 13.0% 11.2% 11.9% 13.7% 11.1% 13.7%	Mean Difference IV. Random, 95% CI Year -1.86 [-2.23, -1.49] 2020 0.08 [-0.80, 0.96] 2018 -0.10 [-0.69, 0.49] 2017 -0.13 [-1.04, 0.78] 2017 -0.08 [-0.87, 0.71] 2017 0.00 [-0.45, 0.45] 2016 -0.20 [-1.11, 0.71] 2016	Mean Difference IV. Random. 95% Cl
_	Study or Subgroup Wei XT 2020 Zhang YL 2018 Zhong YP 2017 Liu XM 2017 Gong CJ 2017 Sun M 2016 Huang YQ 2016 Zhang Y 2015	Sal <u>j</u> <u>Mean</u> 5.27 5.32 5.1 5.16 5.12 5 5.1 3.29	Dingoto SD 0.92 2.01 1.4 2.14 1.83 1.2 1.9 0.92	Total 54 38 50 42 36 50 35 30	Salpi Mean 7.13 5.24 5.2 5.29 5.2 5.2 5.3 3.85	ngecto SD 1.03 1.88 1.6 2.11 1.6 1.1 2 0.87	my <u>54</u> 38 50 42 36 50 35 30	Weight 14.0% 11.4% 13.0% 11.2% 11.9% 13.7% 11.1% 13.7%	Mean Difference IV. Random, 95% CI Year -1.86 [-2.23, -1.49] 2020 0.08 [-0.80, 0.96] 2018 -0.10 [-0.69, 0.49] 2017 -0.13 [-1.04, 0.78] 2017 -0.08 [-0.87, 0.71] 2017 0.00 [-0.45, 0.45] 2016 -0.20 [-1.11, 0.71] 2016 -0.56 [-1.01, -0.11] 2015	Mean Difference IV. Random, 95% Cl
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Our results indicated that no difference in the operation time and postoperative hospitalization time between the two surgical methods, but the volume of bleeding in patients with laparoscopic salpingotomy and the damage to patients is less than that in salpingectomy. Salpingectomy can completely remove the affected side of the fallopian tube and completely

	Salninget	omv	Salningaa	tomy		Odde Patio			() ddi	Patio		
Study or Subgroup	Events	Total	Events	Total	Weight	M-H Random 95% CL	Voar		M-H Ran	dom 95% C	1	
Wong MY 2020	20	10101	LVEIIIS	40	5 5%	0 00 12 70 20 021 1	2020		WI-II, IXaliy			_
	20	40	4	40	7 10/	3 70 [1 67 9 21]	2020					
Zhou CX 2010	34	34	12	20	5.5%	5.70 [1.07, 0.21] 2 6 54 [1 07, 21 74] 2	2020					
ZHOU CT 2019	23	40	24	30	6 10/	2 05 11 04 9 241	2019				_	
Mana 7X 2019	33	40	17	39	7 20/	2.95 [1.04, 0.34] 2	2019					
Chiev 2010	20	40	17	40	7.3% E 70/	1.95 [0.91, 4.15] 2	2010			-		
Shi SX 2018	27	40	35	40	5.1%	0.30 [0.09, 0.93]	2018			_		
Zhou Y 2018	19	53	18	53	7.1%	1.09 [0.49, 2.42]	2018				_	
Yan XL 2018	21	40	12	40	6.6%	2.58 [1.03, 6.46]	2018					
Zhang YL 2018	19	38	10	38	6.4%	2.80 [1.07, 7.33] 2	2018				_	
Zhong YP 2017	21	42	12	42	6.7%	2.50 [1.01, 6.16] 2	2017					
Liu XM 2017	32	50	9	50	6.6%	8.10 [3.21, 20.41]	2017					
Sun M 2016	32	50	10	50	6.7%	7.11 [2.89, 17.53] 2	2016					
Huang YQ 2016	18	35	10	35	6.3%	2.65 [0.99, 7.11] 2	2016					
Moif 2014	108	215	114	231	8.8%	1.04 [0.71, 1.50] 2	2014		_			
Fernandez H 2013	44	63	42	66	7.4%	1.32 [0.63, 2.76]	2013		_	-		
Total (95% CI)		850		868	100.0%	2.49 [1.61, 3.86]				-		
Total events	479		347									
Heterogeneity: Tau ² =	0.53; Chi ² =	56.37, 0	df = 14 (P <	< 0.0000	1); l ² = 75%	0	H	0.04		1	10	40
								Favous	[Capingeciony]	i avoaro (e	apingotom	,,
	Salpingo	otomy	Salpinge	ctomy		Odds Ratio		Favous	Ode	ds Ratio		,,,
Study or Subgroup	Salpingo Events	otomy <u>Total</u>	Salpinge Events	ctomy Tota	Weight	Odds Ratio M-H. Random. 95% CI	Year		Ode M-H. Rai	ds Ratio ndom. 95%	CI	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
Study or Subgroup Wang MX 2020	Salpingo Events	otomy <u>Total</u> 40	Salpinge Events 6	ctomy Tota 40	Weight 4.6%	Odds Ratio <u>M-H. Random. 95% CI</u> 0.15 [0.02, 1.27]	<u>1 Year</u> 2020		Odi <u>M-H. Ra</u>	ds Ratio	CI	
Study or Subgroup Wang MX 2020 Bian XY 2020	Salpingo <u>Events</u> 1 4	otomy <u>Total</u> 40 58	Salpinge Events 6 5	ctomy Tota 40 58	Weight 4.6% 7.3%	Odds Ratio <u>M-H. Random. 95% CI</u> 0.15 [0.02, 1.27] 0.79 [0.20, 3.08]	Year 2020 2020		Odi <u>M-H. Ra</u>	ds Ratio	CI	
Study or Subgroup Wang MX 2020 Bian XY 2020 Zhou CY 2019	Salpingo Events 1 4 2	otomy <u>Total</u> 40 58 30	Salpinge Events 6 5 9	ctomy Tota 40 58 300	Weight 4.6% 7.3% 6.3%	Odds Ratio M-H. Random. 95% CI 0.15 [0.02, 1.27] 0.79 [0.20, 3.08] 0.17 [0.03, 0.85]	Year 2020 2020 2019		Odk 	ds Ratio	<u>CI</u>	
Study or Subgroup Wang MX 2020 Bian XY 2020 Zhou CY 2019 Zhou Y 2018	Salpingo Events 1 4 2 13	otomy <u>Total</u> 40 58 30 53	Salpinge Events 6 5 9 8	Ectomy Tota 40 58 30 53	Weight 4.6% 7.3% 6.3% 9.1%	Odds Ratio <u>M-H. Random. 95% CI</u> 0.15 [0.02, 1.27] 0.79 [0.20, 3.08] 0.17 [0.03, 0.85] 1.83 [0.69, 4.86]	2020 2020 2019 2018		Ode 	ds Ratio ndom. 95%	<u>CI</u>	
Study or Subgroup Wang MX 2020 Bian XY 2020 Zhou CY 2019 Zhou Y 2018 Zhang YL 2018	Salpingo Events 1 4 2 13 3	otomy Total 40 58 30 53 38	Salpinge Events 6 5 9 8 5	Total 40 58 30 53 38	Weight 4.6% 7.3% 6.3% 9.1% 6.7%	Odds Ratio <u>M-H. Random. 95% Cl</u> 0.15 [0.02, 1.27] 0.79 [0.20, 3.08] 0.17 [0.03, 0.85] 1.83 [0.69, 4.86] 0.57 [0.13, 2.56]	2020 2020 2019 2018 2018		Ode 	ds Ratio	<u>CI</u>	
Study or Subgroup Wang MX 2020 Bian XY 2020 Zhou CY 2019 Zhou Y 2018 Zhang YL 2018 Yan XL 2018	Salpingo Events 1 4 2 13 3 5	tomy Total 40 58 30 53 38 40	Salpinge Events 6 5 9 8 5 3	Tota 40 58 30 53 38 40	Weight 4.6% 7.3% 6.3% 9.1% 6.7% 6.8%	Odds Ratio <u>M-H. Random. 95% Cl</u> 0.15 [0.02, 1.27] 0.79 [0.20, 3.08] 0.17 [0.03, 0.85] 1.83 [0.69, 4.86] 0.57 [0.13, 2.56] 1.76 [0.39, 7.93]	2020 2020 2019 2018 2018 2018		Odu 	ds Ratio	CI	
Study or Subgroup Wang MX 2020 Bian XY 2020 Zhou CY 2019 Zhou Y 2018 Zhang YL 2018 Yan XL 2018 Wang ZX 2018	Salpingo Events 1 4 2 13 3 5 26	Total 40 58 30 53 38 40 60	Salpinge Events 6 5 9 8 5 3 5 5	Tota 40 58 30 53 38 40 60	Weight 4.6% 7.3% 6.3% 9.1% 6.7% 6.8% 8.8%	Odds Ratio M-H, Random, 95% CI 0.79 [0.20, 3.08] 0.17 [0.03, 0.85] 1.83 [0.69, 4.86] 0.57 [0.13, 2.56] 1.76 [0.39, 7.93] 8.41 [2.95, 24.00]	2020 2020 2019 2018 2018 2018 2018 2018		Oda 	ds Ratio	<u>CI</u>	
Study or Subgroup Wang MX 2020 Bian XY 2020 Zhou CY 2019 Zhou Y 2018 Zhang YL 2018 Yan XL 2018 Wang ZX 2018 Zhong YP 2017	Salpingo Events 1 4 2 13 3 5 26 4	otomy Total 40 58 30 53 38 40 60 42	Salpinge Events 6 5 9 8 5 3 5 6	Ectomy Total 40 58 30 53 38 40 60 42	Weight 4.6% 7.3% 6.3% 9.1% 6.7% 6.8% 8.8% 7.4%	Odds Ratio <u>M-H, Random, 95% CI</u> 0.75 [0.02, 1.27] 0.79 [0.20, 3.08] 0.17 [0.03, 0.85] 1.83 [0.69, 4.86] 0.57 [0.13, 2.56] 1.76 [0.39, 7.93] 8.41 [2.95, 24.00] 0.63 [0.16, 2.42]	2020 2020 2019 2018 2018 2018 2018 2018 2017		Odd 	ds Ratio ndom, 95%	CI	_
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Study or Subgroup Wang MX 2020 Bian XY 2020 Zhou CY 2019 Zhou Y 2018 Zhang YL 2018 Yan XL 2018 Wang ZX 2018 Zhong YP 2017 Liu XM 2017 Huang YQ 2016 Sun M 2016 Zhang Y 2015 Moif 2014	Salpingo Events 1 4 2 13 3 5 26 4 5 5 5 5 5 5 14 18	totomy Total 40 58 30 53 38 40 60 42 50 35 50 30 30 215	Salpinge Events 6 5 9 8 8 5 3 5 6 6 3 6 6 0 12	Total 40 58 30 53 38 40 60 42 50 35 50 30 231	Weight 4.6% 7.3% 6.3% 9.1% 6.7% 6.8% 8.8% 7.4% 7.8% 6.7% 3.1% 10.1%	Odds Ratio M-H. Random, 95% CI 0.79 [0.20, 3.08] 0.77 [0.03, 0.85] 1.83 [0.69, 4.86] 0.57 [0.13, 2.56] 1.76 [0.39, 7.93] 8.41 [2.95, 24.00] 0.63 [0.16, 2.42] 0.81 [0.23, 2.87] 1.78 [0.39, 8.09] 0.81 [0.23, 2.87] 53.61 [3.00, 956.98] 1.67 [0.78, 3.55]	2020 2020 2019 2018 2018 2018 2018 2017 2017 2016 2016 2015 2014		Ode 	Js Ratio Idom, 95%. 		-
Study or Subgroup Wang MX 2020 Bian XY 2020 Zhou CY 2019 Zhou Y 2018 Zhang YL 2018 Wang ZX 2018 Wang ZX 2018 Zhong YP 2017 Liu XM 2017 Huang YQ 2016 Zhang Y 2015 Moif 2014 Fernandez H 2013	Salpingo Events 1 4 2 13 3 5 26 4 5 5 5 5 5 14 18 4	tomy Total 40 58 30 53 38 40 60 42 50 355 50 30 215 63	Salpinge Events 6 5 9 8 8 5 3 3 5 6 6 6 6 3 6 6 6 3 0 0 12 6	Total 40 58 30 53 38 40 60 42 50 35 50 30 30 231 66	Weight 4.6% 7.3% 6.3% 9.1% 6.7% 8.8% 7.4% 7.8% 3.1% 10.1% 7.5%	Odds Ratio M-H, Random, 95% CI 0.15 [0.02, 1.27] 0.79 [0.20, 3.08] 1.83 [0.69, 4.86] 0.57 [0.13, 2.56] 1.76 [0.39, 7.93] 8.41 [2.95, 24.00] 0.63 [0.16, 2.42] 0.81 [0.23, 2.87] 1.78 [0.39, 8.09] 0.81 [0.23, 2.87] 53.61 [3.00, 956.98] 1.67 [0.78, 3.55] 0.68 [0.18, 2.53]	2020 2020 2019 2018 2018 2018 2018 2017 2017 2017 2016 2015 2014 2013		Odd 	ds Ratio ndom. 95%.		-
Study or Subgroup Wang MX 2020 Bian XY 2020 Zhou CY 2019 Zhou Y 2018 Zhang YL 2018 Yan XL 2018 Wang ZX 2018 Zhong YP 2017 Liu XM 2017 Huang YQ 2016 Zhang Y 2015 Moif 2014 Fernandez H 2013 Total (95% CI)	Salpingo Events 1 4 2 13 3 5 26 4 5 5 26 4 5 5 5 14 14 18 4	tomy Total 40 58 30 53 38 40 60 42 50 35 50 30 215 63 804	Salpinge Events 6 5 9 8 5 3 3 5 6 6 6 6 3 6 6 0 12 6	Total Total Total 58 300 533 388 400 600 422 500 355 500 300 2311 666 823	Weight 4.6% 7.3% 6.3% 9.1% 6.7% 8.8% 7.4% 7.8% 6.7% 3.1% 10.1% 7.5% 100.0%	Odds Ratio M-H, Random, 95% CI 0.15 [0.02, 1.27] 0.79 [0.20, 3.08] 0.17 [0.03, 0.85] 1.83 [0.69, 4.86] 0.57 [0.13, 2.56] 1.76 [0.39, 7.93] 8.41 [2.95, 24.00] 0.63 [0.16, 2.42] 0.81 [0.23, 2.87] 1.78 [0.39, 8.09] 0.81 [0.23, 2.87] 53.61 [3.00, 956.98] 1.67 [0.78, 3.55] 0.68 [0.18, 2.53] 1.15 [0.64, 2.07]	2020 2020 2018 2018 2018 2018 2018 2018		Odd 	ds Ratio ndom. 95%	CI	
Study or Subgroup Wang MX 2020 Bian XY 2020 Zhou CY 2019 Zhou Y 2018 Zhang YL 2018 Yan XL 2018 Wang ZX 2018 Zhong YP 2017 Liu XM 2017 Huang YQ 2016 Sun M 2016 Zhang Y 2015 Moif 2014 Fernandez H 2013 Total (95% CI) Total events	Salpingo Events 1 4 2 13 3 5 26 4 5 5 5 5 5 5 5 14 18 4 109	Total 40 53 30 53 38 40 60 42 50 35 50 30 215 63 80 4	Salpinge Events 6 5 9 8 8 5 3 3 5 6 6 6 3 6 6 0 12 6 80	Tota Tota 40 58 300 53 38 40 60 42 500 35 500 30 231 66 823	Weight 4.6% 7.3% 6.3% 9.1% 6.7% 8.8% 7.4% 7.8% 6.7% 10.1% 7.5% 100.0%	Odds Ratio M-H, Random, 95% CI 0.15 [0.02, 1.27] 0.79 [0.20, 3.08] 1.83 [0.69, 4.86] 0.57 [0.13, 2.56] 1.76 [0.39, 7.93] 8.41 [2.95, 24.00] 0.63 [0.16, 2.42] 0.81 [0.23, 2.87] 1.78 [0.39, 8.09] 0.81 [0.23, 2.87] 1.78 [0.39, 8.09] 0.81 [0.23, 2.87] 53.61 [3.00, 956.98] 1.67 [0.78, 3.55] 0.68 [0.18, 2.53] 1.15 [0.64, 2.07]	2020 2020 2019 2018 2018 2018 2017 2016 2016 2015 2014 2013		Odd 	ds Ratio		-
Study or Subgroup Wang MX 2020 Bian XY 2020 Zhou CY 2019 Zhou Y 2018 Zhang YL 2018 Wang ZX 2018 Wang ZX 2018 Zhong YP 2017 Liu XM 2017 Huang YQ 2016 Sun M 2016 Zhang Y 2015 Moif 2014 Fernandez H 2013 Total (95% CI) Total events Heterogeneity: Tau ²	Salpinge Events 1 4 2 13 3 5 26 4 5 5 5 5 14 18 4 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	Dotomy Total 400 58 300 53 388 40 600 42 500 355 500 300 2115 63 804 = 34.93,	Salpinge Events 6 5 9 8 5 3 3 5 6 6 3 3 5 6 6 3 3 6 0 12 6 80 , df = 13 (P	Total Total 50 53 38 40 60 42 50 30 231 66 823 = 0.000	Weight 4.6% 7.3% 6.3% 9.1% 6.7% 6.8% 8.8% 7.4% 7.8% 3.1% 10.1% 7.5% 100.0% 9); I² = 63%	Odds Ratio M-H, Random, 95% CI 0.15 [0.02, 1.27] 0.79 [0.20, 3.08] 0.17 [0.03, 0.85] 1.83 [0.69, 4.86] 0.57 [0.13, 2.56] 1.76 [0.39, 7.93] 8.41 [2.95, 24.00] 0.63 [0.16, 2.42] 0.81 [0.23, 2.87] 1.78 [0.39, 8.09] 0.81 [0.23, 2.87] 53.61 [3.00, 956.98] 1.67 [0.78, 3.55] 0.68 [0.18, 2.53] 1.15 [0.64, 2.07]	Year 2020 2019 2018 2018 2018 2018 2018 2017 2017 2016 2016 2015 2014 2013		Odd 	ds Ratio ndom, 95%	CI	
Study or Subgroup Wang MX 2020 Bian XY 2020 Zhou CY 2019 Zhou Y 2018 Zhang YL 2018 Yan XL 2018 Wang ZX 2018 Zhong YP 2017 Liu XM 2017 Huang YQ 2016 Sun M 2016 Zhang Y 2015 Moif 2014 Fernandez H 2013 Total (95% CI) Total events Heterogeneity: Tau ² Test for overall effect	Salpingo Events 1 4 2 13 3 5 26 4 5 5 5 4 5 5 5 14 18 4 109 = 0.73; Chi ² t: Z = 0.47 (F	Total 400 58 300 533 38 400 42 500 300 215 63 804 = 34.93, 32 = 34.93, 32	Salpinge Events 6 5 9 8 8 5 6 6 6 6 3 5 6 6 6 0 12 6 80 12 6 80 9 9 80 9 80 9 80 9 80 9 9 8 8 9 8 8 9 8 8 9 8 8 5 9 8 8 8 5 9 8 8 8 5 8 8 8 5 9 8 8 5 9 8 8 5 9 8 8 5 9 8 8 5 9 8 8 5 9 8 8 5 9 8 8 5 9 8 8 5 9 8 8 5 9 8 8 5 9 8 8 5 9 8 8 5 6 6 9 8 8 5 6 6 9 8 8 5 6 6 6 6 6 6 6 9 8 8 5 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	Total Total 50 50 50 60 42 50 35 500 231 66 823 = 0.000	Weight 4.6% 7.3% 6.3% 9.1% 6.7% 8.8% 7.4% 7.8% 3.1% 10.1% 7.5% 100.0% 9); I² = 63%	Odds Ratio M-H. Random. 95% CI 0.15 [0.02, 1.27] 0.79 [0.20, 3.08] 1.83 [0.69, 4.86] 0.57 [0.13, 2.56] 1.76 [0.39, 7.93] 8.41 [2.95, 24.00] 0.63 [0.16, 2.42] 0.81 [0.23, 2.87] 1.78 [0.39, 8.09] 0.81 [0.23, 2.87] 53.61 [3.00, 956.88] 1.67 [0.78, 3.55] 0.68 [0.18, 2.53] 1.15 [0.64, 2.07]	2020 2021 2019 2018 2018 2018 2018 2018 2017 2016 2015 2014 2013		Odd 	ds Ratio ndom. 95%.	CI	- - 50 500my]

remove the focus. Because salpingotomy retains the diseased fallopian tube, it may increase the risk of embryonic tissue residue. A comparison of the postoperative hCG levels of patients reveals no significant difference in hCG levels between the two surgical methods, suggesting that salpingotomy can also effectively remove the embryonic tissue in the fallopian tube.

Many studies have reported the intrauterine pregnancy rate after ectopic pregnancy surgery, but so far, there is no consensus on the impact of salpingotomy and salpingectomy on fertility in patients with ectopic pregnancy. Although salpingectomy retains the contralateral fallopian tube, it will still affect the postoperative fertility rate of patients. Studies (9, 34–36) have found that if the contralateral fallopian tube is healthy, there is no difference in fertility between salpingotomy and salpingectomy. However, for patients with infertility history, fallopian tube disease, or age more than 35 years old, the intrauterine pregnancy rate after salpingotomy is significantly higher than that of patients with salpingectomy (37-38). Our meta-analysis results also suggest that without considering these confounding factors, the intrauterine pregnancy rate of patients after salpingotomy is significantly higher than that after salpingectomy, and there is no difference in the incidence of ectopic pregnancy. Therefore, the reproductive function of patients is better protected by laparoscopic salpingotomy. Interestingly, subgroup analysis results showed patients with salpingotomy combined with suture exhibited a significantly lower ectopic pregnancy rate than that of patients with salpingectomy. Besides, salpingotomy combined with suture had higher intrauterine pregnancy rate and lower extrauterine pregnancy rate than that of salpingotomy without suture. Therefore, salpingotomy combined with suture should be recommend, according to the results of this meta-analysis. At present, whether to suture the tubal after salpingotomy is a

۸		Salni	ngotom	NV.	Salnin	nectom	N.		Mean Difference	Mean Difference
A	Study or Subaroup	Mean	SD 1	rotal	Mean	SD T	otal	Weight	IV. Random. 95% CI Year	IV. Random, 95% Cl
-	Zhou CY 2019	6.48	1.42	30	7.36	1.74	30	11.5%	-0.88 [-1.68, -0.08] 2019	
	Yue YH 2019	3.29	2.54	40	5.41	2.43	39	9.8%	-2.12 [-3.22, -1.02] 2019	
	Shi SX 2018	5.4	1.5	40	6.3	1.9	40	11.8%	-0.90 [-1.65, -0.15] 2018	
	Wu XM 2018	5.13	1.41	30	8.66	1.44	30	11.9%	-3.53 [-4.25, -2.81] 2018	
	Liao C 2017	5.22	1.59	50	7.63	1.95	50	12.1%	-2.41 [-3.11, -1.71] 2017	
	Shan DY 2017	5.12	1.23	30	7.65	1.86	30	11.5%	-2.53 [-3.33, -1.73] 2017	
	Yang L 2015	5.14	1.34	30	7.71	1.87	30	11.4%	-2.57 [-3.39, -1.75] 2015	
	Zhu L 2013	5.17	1.45	20	7.72	1.91	20	10.1%	-2.55 [-3.60, -1.50] 2013	
	Xie QX 2012	5.16	1.48	20	7.73	1.92	20	10.0%	-2.57 [-3.63, -1.51] 2012	
				200			200	400.00/	0.001.0.00 4.041	
	Total (95% CI)			290	0 (D) (289	100.0%	-2.22 [-2.83, -1.61]	
	Heterogeneity: I au ² = 0	0.68; Ch	12 = 37.6	64, df =	8 (P < (0.00001); ² =	79%		-4 -2 0 2 4
	Test for overall effect: 2	z = 7.14	(P < 0.0	0001)						Favours [Salpingotomy] Favours [Salpingectomy]
		Sal	aingoto	2017	Salni	agento	2014		Mean Difference	Mean Difference
В	Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV. Random, 95% CI Year	IV. Random, 95% Cl
_	Zhou CY 2019	6.95	1.85	30	7.19	2.35	30	10.6%	-0.24 [-1.31, 0.83] 2019	
	Yue YH 2019	6.84	1.81	40	5.33	1.94	39	11.6%	1.51 [0.68, 2.34] 2019	
	Wu XM 2018	6.55	1.67	30	7.98	1.61	30	11.6%	-1.43 [-2.26, -0.60] 2018	
	Shi SX 2018	6.2	2.4	40	8.4	4.2	40	8.8%	-2.20 [-3.70, -0.70] 2018	
	Shan DY 2017	6.22	1.57	30	7.92	1.61	30	11.7%	-1.70 [-2.50, -0.90] 2017	
	Liao C 2017	6.49	1.69	50	8.24	1.76	50	12.2%	-1.75 [-2.43, -1.07] 2017	
	Yang L 2015	6.89	1.86	34	7.91	1.6	34	11.7%	-1.02 [-1.84, -0.20] 2015	
	Zhu L 2013	6.88	1.66	20	7.94	1.62	20	10.9%	-1.06 [-2.08, -0.04] 2013	
	Xie QX 2012	6.89	1.67	20	7.95	1.63	20	10.8%	-1.06 [-2.08, -0.04] 2012	
	-							100 00/		
	Total (95% CI)	1 00 0	L 12 - 40	294	0 (D	0.0000	293	100.0%	-0.97 [-1.72, -0.23]	
	Heterogeneity: 1 au ² =	7 - 2 5	ni* = 48.	.37, ar	= 8 (P <	0.0000	1); 1^ =	- 83%		-4 -2 0 2 4
	Test for overall effect.	2 - 2.5	6 (P = 0.	.01)						Favours [Salpingotomyl] Favours [Salpingectomy]
C	ot 1 _ 0 1	Sal	pingoto	my	Salp	ingecto	omy		Mean Difference	Mean Difference
U	Study or Subgroup	Mean		lota	Mean			al weigh	t IV. Random, 95% CI Year	IV. Random. 95% CI
	Zhou CY 2019	142.97	20.83	30	131.62	19.35	3	0 12.5%	11.35 [1.18, 21.52] 2019	
	Shi SX 2018	38 6	61	40	44 3	85		9 15.1% 0 14.8%	-5.80 [-9.04 -2.56] 2018	+
	Shan DY 2017	142 7	24.2	30	132 7	207	3	0 12.0%	10 00 [-1 40 21 40] 2017	
	Liao C 2017	165.46	23.21	50	133.72	23.04	5	0 12.9%	31.74 [22.68, 40.80] 2017	
	Yang L 2015	148.23	26.21	34	136.2	21.32	3	4 12.0%	12.03 [0.67, 23.39] 2015	
	Zhu L 2013	146.78	25.78	20	135.76	21.98	2	0 10.4%	11.02 [-3.83, 25.87] 2013	—
	Xie QX 2012	147.26	25.84	20	135.08	22.39	2	0 10.4%	12.18 [-2.80, 27.16] 2012	
	T-4-1 (05% OI)			004				2 400 00	44 50 50 00 00 001	
	Hotorogonoitu Tou2 =	120.00.	Chi2 = 1	204	$df = 7/\Gamma$	< 0.00	20	2 - 0.49/	11.56 [2.96, 20.20]	
	Test for overall effect:	7 = 2.63	(P = 0)	25.90,	ui – 7 (F	< 0.000	JUT), I	94%		-100 -50 0 50 100
	rest for overall effect.	2 - 2.00	(1 - 0.0	,00)						Favours [Salpingectomy] Favours [Salpingotomy]
_		Salr	ingotor	nv	Salpi	naecto	mv		Mean Difference	Mean Difference
D	Study or Subaroup	Mean	SD	Total	Mean	SD	Total	Weight	IV. Fixed, 95% CI Year	IV. Fixed, 95% Cl
	Shan DY 2017	0.37	0.12	30	0.24	0.04	30	42.9%	0.13 [0.08, 0.18] 2017	
	Yang L 2015	0.39	0.17	34	0.24	0.07	34	23.0%	0.15 [0.09, 0.21] 2015	.
	Zhu L 2013	0.38	0.15	20	0.24	0.05	20	18.3%	0.14 [0.07, 0.21] 2013	
	Xie QX 2012	0.39	0.16	20	0.24	0.06	20	15.7%	0.15 [0.08, 0.22] 2012	
	Total (95% CI)			104			104	100.0%	0.14 [0.11, 0.17]	
	Heterogeneity: Chi ² =	0.36, df	= 3 (P =	0.95)	$l^2 = 0\%$				_	-0.2 -0.1 0 0.1 0.2
	Test for overall effect:	Z = 9.22	2 (P < 0.	00001)					Favours [Salpingectomy] Favours [Salpingotomy]
F	0.1	Salp	ingotor	ny	Salpi	ngecto	my		Mean Difference	Mean Difference
	Study or Subgroup	Mean	SD	Total	Mean	SD	Total	Weight	IV, Fixed, 95% CI Year	IV, Fixed, 95% Cl
	Liao C 2017	2.13	0.37	50	1.42	0.26	50	49.0%	0.71 [0.58, 0.84] 2017	
	Shan DY 2017	2.21	0.42	30	1.54	0.37	30	19.2%	0.67 [0.47, 0.87] 2017	
	7bul 2012	2.19	0.50	34	1.00	0.32	34	0.4%	0.03 [0.41, 0.85] 2015	
	ZIU L 2013 Xie OX 2012	2.11	0.54	20	1.5	0.44	20	0.3%	0.01 [0.30, 0.92] 2013	
	AIG QA 2012	2.18	0.00	20	1.51	0.40	20	7.170	0.07 [0.34, 1.00] 2012	
	Total (95% CI)			154			154	100.0%	0.68 [0.59, 0.77]	•
	Heterogeneity: Chi ² =	0.64. df	= 4 (P =	0.96)	² = 0%			/0		
	Test for overall effect:	Z = 15.	14 (P < (0.0000	1)					-1 -0.5 0 0.5 1
					/					Favours [Salpingectomy] Favours [Salpingotomy]
FIGUR	E 5									
Serur	n ovarian hormone	level.	(A) the	level	of FSH	H; (B) 1	the le	evel of L	H; (C) the level of E2; (C	D) the level of T; (E) the level of P.



controversial clinical issue, we expect multi-center, large sample randomized controlled studies to further illustrate this problem.

The ovary is an important reproductive and endocrine organ of women, which has the functions of oviposition, ovulation, and endocrine. The blood supply to the fallopian tube and ovary comes from the fallopian tube branches and ovarian branches from the uterine artery and ovarian artery. These branches coincide with each other in the mesosalpinx to form a rich vascular network. The anastomotic arch of the intra mesosalpinx artery is vulnerable to damage during fallopian tube surgery, affecting the blood supply of the ipsilateral ovary (39). Mekin et al. (40) found that after salpingectomy, the average pulsatile index, RI and systolic/ diastolic ratio of patients' ovaries were significantly lower than

	Subgroup	Salpingotomy (<i>n</i> =)	Salpingectomy (<i>n</i> =)	Effects model	OR/WMD (95% CI)	<i>p</i> -value	Favours
Operating duration	Tubal suturing No-tubal suturing	231 114	231 114	Random Fixed	-4.72 (-11.56-2.13) -0.04 (-1.29-1.20)	0.18 0.95	- -
Hemorrhage	Tubal suturing	329	329	Random	307.46 (197.21 -417.72)	< 0.00001	Salpingotomy
	No-tubal suturing	114	114	Random	152.96 (17.67– 288.24)	<0.00001	Salpingotomy
Hospitalize length	Tubal suturing No-tubal suturing	231 74	231 74	Random Fixed	$\begin{array}{c} -0.48 \ (-1.42 - 0.45) \\ -0.01 \ (-0.60 - 0.58) \end{array}$	0.31 0.98	-
β-hCG level	Tubal suturing No-tubal suturing	217 74	217 74	Random Fixed	-6.31 (-19.55-6.92) -1.23 (-3.17-0.72)	0.35 0.22	-
Intrauterine pregnancy	Tubal suturing No-tubal suturing	341 231	340 231	Fixed Random	4.56 (3.25–6.38) 1.42 (0.71–2.83)	<0.00001 0.003	Salpingotomy Salpingotomy
Ectopic pregnancy	Tubal suturing No-tubal suturing	305 191	305 191	Fixed Fixed	2.61 (1.50–4.55) 2.14 (0.72–6.40)	0.007 0.17	Salpingotomy –
FSH level	Tubal suturing No-tubal suturing	120 170	119 170	Random Random	2.00 (1.14–2.87) 2.39 (1.50–3.27)	<0.00001 <0.0001	Salpingotomy Salpingotomy
LH level	Tubal suturing No-tubal suturing	84 210	84 209	Fixed Random	0.83 (0.28–1.38) 1.08 (0.03–2.18)	0.003 0.03	Salpingotomy Salpingotomy
E2 level	Tubal suturing No-tubal suturing	124 140	124 140	Fixed Random	12.34 (11.05–13.63) 11.82 (–8.1–31.75)	<0.00001 0.02	Salpingotomy Salpingotomy
T level	Tubal suturing No-tubal suturing	54 50	54 50	Fixed Fixed	0.15 (0.10-0.19) 0.14 (0.10-0.17)	<0.00001 <0.00001	Salpingotomy Salpingotomy
P level	Tubal suturing No-tubal suturing	54 100	54 100	Fixed Fixed	0.62 (0.45–0.80) 0.70 (0.59–0.80)	<0.00001 <0.00001	Salpingotomy Salpingotomy
Cross-sectional area	Tubal suturing No-tubal suturing	50 140	50 140	Fixed Random	1.39 (0.88–1.90) 2.01 (1.58–2.45)	<0.00001 <0.00001	Salpingotomy Salpingotomy
PSV	Tubal suturing No-tubal suturing	54 100	54 100	Random Random	1.72 (1.63–1.80) 1.64 (1.35–1.92)	<0.00001 <0.00001	Salpingotomy Salpingotomy
EDV	Tubal suturing No-tubal suturing	54 100	54 100	Random Random	1.67 (1.64–1.70) 1.52 (1.19–1.85)	<0.00001 <0.00001	Salpingotomy Salpingotomy
RI	Tubal suturing No-tubal suturing	54 50	54 50	Random Random	0.11 (0.08–0.14) 0.08 (0.00–0.17)	<0.00001 <0.00001	Salpingotomy Salpingotomy

TABLE 3 Meat-analysis of subgroups according to with or without suturing.

the normal level. Therefore, salpingectomy can easily destroy the blood supply of the ipsilateral ovary. However, the incision of salpingotomy is located on the opposite side of the mesosalpinx, which can preserve the normal function and structure of the fallopian tube, reduce the injury of the mesosalpinx vessels, and preserve the normal blood supply of the ovary. This meta-analysis reveals that the PSV and EDV of the internal stromal artery of the affected side of the ovary in patients with laparoscopic salpingotomy 6 months after operation were significantly higher than those of salpingectomy, suggesting the blood supply of the affected side of the ovary can be better preserved by laparoscopic salpingotomy.

Chan et al. (41) found that laparoscopic salpingectomy on the affected side can block a part of the blood supply to the fallopian tube and ovary, resulting in a decrease in the

	Study		%
	ID	ES (95% CI)	Weight
	Tubal suturing subgroup		
	Huang YQ 2016	0.51 (0.35, 0.68)	7.09
	Sun M 2016	0.64 (0.51, 0.77)	7.89
	Liu XM 2017	0.64 (0.51, 0.77)	7.89
	Zhong YP 2017	0.50 (0.35, 0.65)	7.44
	Yue YH 2019	• 0.82 (0.71, 0.94)	8.25
	Zhou CY 2019 -	• 0.83 (0.70, 0.97)	7.88
	Wang MX 2020	0.50 (0.35, 0.65)	7.35
	Wei XT 2020	0.63 (0.50, 0.76)	7.99
	Subtotal (I-squared = 72.8%, p = 0.001)	0.64 (0.55, 0.74)	61.76
	No tubal suturing subgroup		
	Shi SX 2018	0 68 (0 53 0 82)	7 59
	Wang 7X 2018	0 43 (0 31 0 56)	8.07
	Yan XI 2018	0.52 (0.37, 0.68)	7.35
	Zhang YL 2018	0.50 (0.34, 0.66)	7.25
	Zhou Y 2018	0.36 (0.23, 0.49)	7.98
	Subtotal (I-squared = 64.3% $p = 0.024$)	0.49 (0.39, 0.60)	38 24
		0.40 (0.00, 0.00)	00.24
	Overall (I-squared = 78.0%, p = 0.000)	0.58 (0.50, 0.67)	100.00
	NOTE: Weights are from random effects analysis		
	967 0	.967	
в	967 0 Study	.967	%
в	967 0 Study ID	.967 ES (95% CI)	% Weight
в	967 0 Study ID Tubal suturing subgroup	.967 ES (95% CI)	% Weight
в	967 0 Study ID Tubal suturing subgroup Huang YQ 2016	.967 ES (95% CI) 0.14 (0.03, 0.26)	% Weight 7.86
в	967 0 Study ID Tubal suturing subgroup Huang YQ 2016 Sun M 2016	.967 ES (95% Cl) 0.14 (0.03, 0.26) 0.10 (0.02, 0.18)	% Weight 7.86 9.51
в	967 0 Study ID Tubal suturing subgroup Huang YQ 2016 Sun M 2016 Liu XM 2017	.967 ES (95% Cl) 0.14 (0.03, 0.26) 0.10 (0.02, 0.18) 0.10 (0.02, 0.18)	% Weight 7.86 9.51 9.51
в	967 0 Study ID Tubal suturing subgroup Huang YQ 2016 Sun M 2016 Liu XM 2017 Zhong YP 2017	.967 ES (95% Cl) 0.14 (0.03, 0.26) 0.10 (0.02, 0.18) 0.10 (0.02, 0.18) 0.10 (0.01, 0.18)	% Weight 7.86 9.51 9.51 9.22
в	967 0 Study ID Tubal suturing subgroup Huang YQ 2016 Sun M 2016 Liu XM 2017 Zhong YP 2017 Zhou CY 2019	.967 ES (95% Cl) 0.14 (0.03, 0.26) 0.10 (0.02, 0.18) 0.10 (0.02, 0.18) 0.10 (0.01, 0.18) 0.07 (-0.02, 0.16)	% Weight 7.86 9.51 9.51 9.22 9.20
в	967 0 Study ID Tubal suturing subgroup Huang YQ 2016 Sun M 2016 Liu XM 2017 Zhong YP 2017 Zhou CY 2019 Wang MX 2020	.967 ES (95% Cl) 0.14 (0.03, 0.26) 0.10 (0.02, 0.18) 0.10 (0.02, 0.18) 0.10 (0.01, 0.18) 0.07 (-0.02, 0.16) 0.03 (-0.02, 0.07)	% Weight 7.86 9.51 9.51 9.22 9.20 11.15
В	967 0 Study ID Tubal suturing subgroup Huang YQ 2016 Sun M 2016 Liu XM 2017 Zhong YP 2017 Zhou CY 2019 Wang MX 2020 Bian XY 2020	.967 ES (95% Cl) 0.14 (0.03, 0.26) 0.10 (0.02, 0.18) 0.10 (0.02, 0.18) 0.10 (0.01, 0.18) 0.07 (-0.02, 0.16) 0.03 (-0.02, 0.07) 0.07 (0.00, 0.13)	% Weight 7.86 9.51 9.51 9.22 9.20 11.15 10.40
В	967 0 Study ID Tubal suturing subgroup Huang YQ 2016 Sun M 2016 Liu XM 2017 Zhong YP 2017 Zhou CY 2019 Wang MX 2020 Bian XY 2020 Subtotal (I-squared = 2.2%, p = 0.408)	.967 ES (95% Cl) 0.14 (0.03, 0.26) 0.10 (0.02, 0.18) 0.10 (0.02, 0.18) 0.10 (0.01, 0.18) 0.07 (-0.02, 0.16) 0.03 (-0.02, 0.07) 0.07 (0.00, 0.13) 0.07 (0.04, 0.10)	% Weight 7.86 9.51 9.51 9.22 9.20 11.15 10.40 66.83
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В	967 0 Study ID Tubal suturing subgroup Huang YQ 2016 Sun M 2016 Liu XM 2017 Zhong YP 2017 Zhou CY 2019 Wang MX 2020 Bian XY 2020 Subtotal (I-squared = 2.2% , p = 0.408) No tubal suturing subgroup Wang ZX 2018 Yan XL 2018 Zhang YL 2018	.967 ES (95% Cl) 0.14 (0.03, 0.26) 0.10 (0.02, 0.18) 0.10 (0.02, 0.18) 0.10 (0.01, 0.18) 0.07 (-0.02, 0.16) 0.03 (-0.02, 0.07) 0.07 (0.00, 0.13) 0.07 (0.04, 0.10) 0.43 (0.31, 0.56) 0.13 (0.02, 0.23) 0.08 (-0.01, 0.16) 0.05 (0.12, 0.25)	% Weight 7.86 9.51 9.51 9.22 9.20 11.15 10.40 66.83 7.41 8.52 9.38 7.86
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В	967 0 Study ID Tubal suturing subgroup Huang YQ 2016 Sun M 2016 Liu XM 2017 Zhong YP 2017 Zhou CY 2019 Wang MX 2020 Bian XY 2020 Subtotal (I-squared = 2.2%, p = 0.408) No tubal suturing subgroup Wang ZX 2018 Zhang YL 2018 Zhou Y 2018 Subtotal (I-squared = 87.1%, p = 0.000)	.967 ES (95% Cl) 0.14 (0.03, 0.26) 0.10 (0.02, 0.18) 0.10 (0.02, 0.18) 0.10 (0.01, 0.18) 0.07 (-0.02, 0.16) 0.03 (-0.02, 0.07) 0.07 (0.00, 0.13) 0.07 (0.04, 0.10) 0.43 (0.31, 0.56) 0.13 (0.02, 0.23) 0.08 (-0.01, 0.16) 0.25 (0.13, 0.36) 0.22 (0.07, 0.36)	% Weight 7.86 9.51 9.51 9.22 9.20 11.15 10.40 66.83 7.41 8.52 9.38 7.86 33.17
В	967 0 Study ID Tubal suturing subgroup Huang YQ 2016 Sun M 2016 Liu XM 2017 Zhong YP 2017 Zhou CY 2019 Wang MX 2020 Bian XY 2020 Subtotal (I-squared = 2.2%, p = 0.408) No tubal suturing subgroup Wang ZX 2018 Zhang YL 2018 Zhou Y 2018 Subtotal (I-squared = 87.1%, p = 0.000) Overall (I-squared = 77.6%, p = 0.000)	.967 ES (95% Cl) 0.14 (0.03, 0.26) 0.10 (0.02, 0.18) 0.10 (0.02, 0.18) 0.10 (0.01, 0.18) 0.07 (-0.02, 0.16) 0.03 (-0.02, 0.07) 0.07 (0.00, 0.13) 0.07 (0.04, 0.10) 0.43 (0.31, 0.56) 0.13 (0.02, 0.23) 0.08 (-0.01, 0.16) 0.25 (0.13, 0.36) 0.22 (0.07, 0.36) 0.12 (0.07, 0.18)	% Weight 7.86 9.51 9.51 9.22 9.20 11.15 10.40 66.83 7.41 8.52 9.38 7.86 33.17 100.00
В	967 0 Study ID Tubal suturing subgroup Huang YQ 2016 Sun M 2016 Liu XM 2017 Zhong YP 2017 Zhou CY 2019 Wang MX 2020 Bian XY 2020 Subtotal (I-squared = 2.2%, p = 0.408) No tubal suturing subgroup Wang ZX 2018 Yan XL 2018 Zhang YL 2018 Zhou Y 2018 Subtotal (I-squared = 87.1%, p = 0.000) Overall (I-squared = 77.6%, p = 0.000) NOTE: Weights are from random effects analysis	.967 ES (95% Cl) 0.14 (0.03, 0.26) 0.10 (0.02, 0.18) 0.10 (0.02, 0.18) 0.10 (0.01, 0.18) 0.07 (-0.02, 0.16) 0.03 (-0.02, 0.07) 0.07 (0.04, 0.10) 0.07 (0.04, 0.10) 0.43 (0.31, 0.56) 0.13 (0.02, 0.23) 0.8 (-0.01, 0.16) 0.25 (0.13, 0.36) 0.22 (0.07, 0.36) 0.12 (0.07, 0.18)	% Weight 7.86 9.51 9.22 9.20 11.15 10.40 66.83 7.41 8.52 9.38 7.86 33.17 100.00

Comparison of salpingotomy with and without suturing (A) intrauterine pregnancy rate; (B) ectopic pregnancy rate.



number of ovarian follicles on the affected side, consequently, a decrease in ovarian reserve function on the affected side. Ovarian volume and the number of sinus follicles can reflect the reserve function of the ovary. The number of sinus follicles is a stage in the growth and development of follicles, which is the precursor of mature follicles. When ovarian function decreases, the number of sinus follicles also shows a parallel downward trend. Similarly, the number of sinus follicles is closely related to ovarian volume. When ovarian reserve function decreases, ovarian volume decreases. Metaanalysis showed a significantly higher number of follicles in the affected sinus and the cross-sectional area of ovaries in patients who underwent salpingotomy than those who underwent salpingectomy, indicating that salpingectomy reduced the reserve function of the affected ovary. In addition, Serum ovarian hormone level, such as FSH, LH, E2,

T and P are all sensitive indicators to evaluate ovarian endocrine function. With the decline in ovarian function, FSH and LH levels increase, while E2, T and P levels decrease. This meta-analysis showed that the serum FSH and LH levels of patients with salpingotomy were significantly lower than those in the salpingectomy group 6 months after the operation, and the levels of E2, T and P were significantly higher than that in the salpingectomy group, suggesting better preservation of the ovarian endocrine and reproductive function of patients after that laparoscopic salpingotomy can, which then improves the probability of postoperative second pregnancy.

Pretreatment with methotrexate or mifepristone can effectively inhibit the proliferation of trophoblasts and induce embryonic death, which could reduce the HCG level and intraoperative bleeding (42, 43). However, these ectopic

pregnancy patients included in this study were not pretreated with methotrexate or mifepristone before laparoscopic surgery, which exactly will increase the bias of the results, especially for salpingotomy. Besides, a potential limitation of our metaanalysis is that most of the included studies were from China. In fact, we have included two literatures from different countries include 645 patients, mainly from the United Kingdom, Netherlands, United Kingdom, France and United States, accounting for 27.4% (645/2,354) of the total number of patients included in this meta-analysis. However, a potential limitation of this meta-analysis that 72.7% of the included patients were from China, which may affect the representativeness of the conclusion. Another potential limitation is that the surgical experience used by different hospitals, perioperative management methods, and the urgency of patients for fertility may produce different results and increase the heterogeneity of included studies. Therefore, it is necessary to further conduct a well-designed large-scale multicenter randomized controlled trial to study the equivalence or non-inferiority of laparoscopic salpingectomy and salpingotomy in the treatment of tubal pregnancy.

Conclusion

For patients with tubal pregnancy, the natural intrauterine pregnancy rate after laparoscopic salpingotomy was significantly higher than those who underwent salpingectomy. In addition, laparoscopic salpingotomy can better protect the ovarian reserve function and endocrine function and provide favorable conditions for the second pregnancy. Therefore, patients with ectopic tubal pregnancy should give priority to laparoscopic salpingotomy for embryo extraction, but we still look forward to a multi-center, large sample, long-term

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follow-up randomized controlled study to provide more reliable clinical evidence.

Data availability statement

The original contributions presented in the study are included in the article/Supplementary Material, further inquiries can be directed to the corresponding author/s.

Author contributions

LW and LH were responsible for the analysis, interpretation of data and graphing. LW wrote the manuscript. LH supervised the whole analysis and contributed to data analysis and editing of the manuscript. All authors contributed to the article and approved the submitted version.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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