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ORIGINAL ARTICLE.

Laparoscopic Salpingectomy versus Methotrexate for Treatment of Undisturbed Tubal Ectopic Pregnancy

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ABSTRACT

Background: Laparoscopic salpingostomy is a well-established treatment for patients with tubal pregnancy who desire to retain fertility. Another approach that preserves the fallopian tube is medical treatment. This study aimed to evaluate the safety and efficacy of laparoscopic versus MTX treatment of well-selected cases of undisturbed ectopic pregnancy.

Methods: patients were divided into first group; 30 cases of undisturbed tubal pregnancy treated by MXT therapy. (25cases) by single dose and (5cases) by second dose: single dose regimen (MTX 50mg /m² IM) and second dose regimen. (MTX 50mg /m²IM) on 7th day. Second group; 30 cases of undisturbed tubal pregnancy treated by laparoscopic salpingostomy. Tubal patency tested after 8 weeks for all cases by hysterosalpingography. Outcome measures were treatment success, tubal preservation, homolateral tubal patency, and fertility potential after each treatment protocol.

Results: There was a statistically significant higher frequency of tubal patency in methotrexate group compared to laparoscopic salpingostomy group, with p-value (p=0.007).

Conclusions: Methotrexate is better than laparoscopic salpingostomy in treating undisturbed tubal pregnancy.

Keywords: Laparoscopy ,Methotrexate, Tubal pregnancy, Laparoscopic salpingostomy

INTRODUCTION

The annual incidence of ectopic pregnancy has increased over the past 30 years [1].Although advances in diagnostic methods have allowed for earlier diagnosis, it still remains a lifethreatening condition. Approximately, 75% of deaths in the first trimester and 9 % of all pregnancy-related deaths are due to EP [2].

By the 1920s, laparotomy and ligation of the bleeding vessels with removal of the affected tube had become the standard of care, and it remained so until the late 1970s, when operative laparoscopy and salpingostomy replaced laparotomy and salpingectomy. In the 1980s and 1990s, medical therapy for ectopic pregnancy was implemented; it has now replaced surgical therapy in many cases. Thus, in less than 3 decades, management of undisturbed ectopic pregnancy has evolved from emergency surgical treatment to conservative medical treatment [3].

Extra uterine pregnancy can often be diagnosed before the patient's condition is deteriorated, so changed into a more benign condition. Diagnostic integrating transvaginal ultrasound and level of human chorionic gonadotrophin (hCG) measurement are the cornerstone of a timely diagnosis**.** Timely diagnosis allows us to consider the full range of treatment option. This is important not only in focused on immediate therapeutic management success which is a narrow aim but also retaining optimal fertility for those women desiring future pregnancy [2].

Nowadays, treatment options for EP patients are surgery, medical treatment or expectant management. In surgery, laparoscopy is now the accepted approach for making salpingostomy or salpingectomy. Laparoscopic salpingotomy is a

well-established treatment modality in patients with tubal pregnancy who desire to retain fertility. This procedure preserves the fallopian tube, thereby maintaining reproductive capacity.An advantage of salpingotomy was the predictable and consistent decline of circulating β-HCG, and consequently a reduced need for reintervention.Administration of MTX has gained an acceptance in selected patients.Systemic medical therapy has advantage over surgical treatment is the avoidance of surgical trauma to the tube. Selection criteria for MTX treatment varied. Although all studies limited recruitment to hemodynamically stable patients with unruptured ectopic pregnancy, in some series large ectopic pregnancies (>3.5 cm), fetal cardiac activity, and serum β-HCG concentrations above 10 000 IU/l were classified as contraindications to systemic MTX treatment.Expectant management has been advocated based on the knowledge that the course of many early EP is a self-limiting process, ultimately resulting in tubal abortion or re-absorption [1].

A well-recognized hazard after systemic MTX treatment and expectant management is persistent trophoblast, abortion or reabsorption. Persistent trophoblast may lead to recurrence of clinical symptoms and is an indication for additional treatment. Serum β-HCG monitoring enables the timely detection of inadequately declining serum β-HCG concentrations after treatment [2].

Future fertility after ectopic pregnancy is dependent on several factors, including age, history of infertility, history of previous EP, tubal rupture, and contralateral tubal lesion. Thus, it seems reasonable to assess tubal patency following a treatment of an ectopic pregnancy in those women who are willing to have future pregnancy [4].

We aimed to evaluate the safety and efficacy of laparoscopic versus MTX treatment of well-selected cases of undisturbed ectopic pregnancy.

METHODS

This prospective study was conducted on sixty cases of undisturbed ectopic pregnancy that were divided into 2 group (laparoscopic group and MTX group) in the period between February to August2022. After obtaining approval form ethical committee.IRB approval # 9347.

Patients with unruptured ectopic pregnancy, hemodynamically stable, serum quantitative β-HCG ≤ 5000 IU/L, size of ectopic mass <3.5cm and no embryonic cardiac motion, minimal to moderate free fluid, normal liver function, kidney functions & electrolytes, and complete blood count and patient available for regular follow up (average period about 35 days) were included in the study.

Patients who were clinically unstable, with severe or persistent abdominal pain or evidence of significant hemoperitoneum on ultrasound scan, serum quantitative β-HCG > 5000 IU/L, ectopic mass >3.5 cm, the presence of cardiac activity, coexistent viable intrauterine pregnancy (heterotopic pregnancy), non-compliant patient / patient living far away from the hospital, clinically significant renal, hepatic or hematological impairment, known hypersensitivity to methotrexate, breast feeding and patients with immunodeficiency/concurrent use of corticosteroids were excluded from the study.

The patients randomly divided into 2 main groups; First group: 30 cases of undisturbed tubal pregnancy treated by MXT therapy. (25cases) by single dose and (5cases) by second dose: single dose regimen (MTX 50mg /m² IM) and second dose regimen. (MTX 50mg /m²IM) on 7th day. Second group: 30 cases of undisturbed tubal pregnancy treated by laparoscopic salpingostomy. Tubal patency tested after 8 weeks for all cases by hysterosalpingography.

All studied patients was subjected to full history taking, general examination; (pulse, temperature, blood pressure, weight and height), local examinations, laboratory investigations (β-HCG, Renal, liver function, Rh, ABO and CBC) and Ultrasound Scan (abdominal and vaginal).

Data collection:

Women who diagnosed as having undisturbed ectopic pregnancy, the increase in HCG progressed only slowly, with a doubling time exceeding 2.2 days. The doubling time of β- HCG is a useful diagnostic aid in cases where transvaginal ultrasound has (yet) given a definite answer regarding the presence of an intra-uterine pregnancy

A tubal pregnancy should be suspected if discriminatory β -HCG zone with no intrauterine gestational sac transabdominal ultrasound with β -HCG titer between 6000mIU/ml 6500mIU /ml or by transvaginal ultrasound β-HCG titer 1500mIU/ml. or ultrasonography reveals gestational tissue in the adnexal area without any evidence of an intrauterine pregnancy. If a yolk sac or embryo is seen in the ectopic gestational tissue, the diagnosis of ectopic pregnancy is definitively confirmed**.**

MTX administration and assessment according to:

Single Dose Protocol

At day 0: β-HCG, liver, renal functions, CBC. Rh (ABO), coagulation profile. At day 1: MTX 50mg/m² I.M. at Day 4: β -HCG level. At day7: β-HCG level decrease by ≥15% follow up weekly

until resolution. At 14 day: If HCG decrease > 15 % day 7-14, repeat HCG weekly 3rd dose of Methotrexate 50mg/m2 if HCG decrease < 15% day 7-14.Monitoring: The HCG is followed weekly until the level is <10 IU/L. Laparoscopy**:** If 3 doses have been given and there is a <15% HCG decline from day 14 to 21.If severe abdominal pain or signs suggestive of tubal rupture [5].

Follow up:

for abdominal pain vital signs, ultrasound scan at day 4th or 7th.

Laparoscopic Procedure:

Under general anesthesia was used in all patients. The patient is placed in a dorsolithotomy position with the buttocks extended over the end of the table. The thighs should be flexed (120°) to allow good instrument manipulation sterilization, foley's catheter is placed in the bladder. Povidone iodine applied to the abdominal wall and vagina extending from the nipple line to the knee. A skin incision of about 1 cm may be made using a number 11-scalpel blade at the umbilical region the trocar 10 mm was inserted**.** After confirmation of diagnosis 5 mm puncture made in the left or right lower quadrant using direct visualization.

Laparoscopic Technique:

Tubal ectopic pregnancy once diagnosed, first we check the healthy tube then treat the diseased one if the pregnancy is in the mid-ampullary segment a solution of vasopressin (20 IU/100Ml. a 5-7 mL dilute of NS) is used. This is injected with a laparoscopic needle into the mesosalpinx just below the pregnancy and over the anti-mesenteric surface of the segment containing the gestation. Using the spatula attached to unipolar to do incision in the antimesenteric border is made over the pregnancy approximately 1-2 cm in length. As one makes this incision the contents of the pregnancy usually begin to extrude. This can be completed by hydro dissection or using gentle traction with laparoscopic forceps. In some cases, more forceful irrigation in the salpingostomy incision may be required to dislodge the pregnancy from its implantation site., coagulation is used to secure hemostasis by bipolar. Copious irrigation is used to dislodge trophoblastic tissue and remove blood from the peritoneal cavity. The tubal opening is left to heal by secondary intention, unless the defect is wide and the edges do not come together spontaneously. For such cases, the edges may be approximated with a single 4-0 absorbable suture. No cases needed salpingectomy. Abdominal drain should being insert[4].

Follow up:

First 24 hours by vital signs blood pressure, pulse rate urine output, temperature and respiratory rate. β-HCG done weekly until reach to zero. 8weeks tubal patency for all cases was evaluated by hysterosalpingography.

Administrative Design:

Clear explanation of the study was made to all patients and written informed consent was taken. The study was approved from Institutional Research Board.

Statistical analysis:

Recorded data were analyzed using the statistical package for social sciences, version 23.0 (SPSS Inc., Chicago, Illinois, USA). The following tests were done: Independent-samples t-test, Mann Whitney U test, Paired sample t-test, Wilcoxon Signed-Rank Sum test, and chi-square (x^2) test of significance was used in order to compare proportions between qualitative parameters.

RESULTS:

Table 1; showed that there was no statistically significant difference between groups according to demographic data, with p-value (p>0.05).

Table 2; showed that there was a no statistically significant β-HCG (1st day "mIU/mL") in Laparoscopic salpingostomy group compared to methotrexate group, with p-value (p0.44); while the rest have insignificant difference between groups, with p-value (p>0.05).

Table 3; showed that there was a highly statistically significant higher β-HCG (4th day and 7th day "mIU/mL") in methotrexate group compared to Laparoscopic salpingostomy group, with p-value (p<0.001).

Table 4; showed that there was a highly statistically significant higher frequency ≥15% decrease at 4th day in Laparoscopic salpingostomy group compared to methotrexate group, with p-value (p<0.001); while 7th day insignificant difference between groups, with p-value (p>0.05).

Table 5; showed that there was no statistically significant difference between groups according to Persistence ectopic, with p-value (p>0.05).

Table 6; showed that there was no statistically significant difference between baseline and 7th day according to laboratory investigations, with p-value (p>0.05).

Table 7; showed that there was statistically significant higher frequency of tubal patency in methotrexate group compared to laparoscopic salpingostomy group, with p-value(p=0.007)

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

Demographic data	Methotrexate group *(n=30)*	Laparoscopic salpingostomy group *(n=30)*	Test value	p-value
Age (year)	27.57±4.71	25.67±3.53	t:1.769	0.082
Body mass index "BMI" (kg/m^2)	27.51±2.43	26.57±2.49	t:1.483	0.144
Gestational age(wks)	7.37±1.43	7.13±1.55	t:0.607	0.546
Gravidity	7 (23.3%)	14 (46.7%)	x^2:3.590	0.058
Parity	1 (0-2)	1 (1-1)	Z:-0.844	0.398
Abortion	8 (26.7%)	9 (30.0%)	x^2:0.082	0.774
History of infertility	9 (30.0%)	14 (46.7%)	x^2:1.763	0.184
Surgical history	14 (46.7%)	19 (63.3%)	x^2:1.684	0.194

Using: t-Independent Sample t-test; Z-Mann-Whitney test; x^2: Chi-square test;

Table (2): Comparison between two studied groups according to laboratory investigations.

Laboratory Investigations	Methotrexate group *(n=30)*	Laparoscopic salpingostomy group *(n=30)*	Test value	p-value
Hemoglobin (g/dl)	10.56 ± 0.89	10.67 ± 0.71	t:-0.529	0.599
WBCs (10^3/mm^3)	7.05 ± 0.96	6.62 ± 1.88	t:1.125	0.267
Platelet count(10^3/mm^3)	190.07 ± 68.44	215.8 ± 42.56	t:-1.749	0.087
INR	1.02 ± 0.12	1.03 ± 0.06	t:-0.337	0.438
Creatinine (mg/dl)	0.77 ± 0.28	0.79 ± 0.22	t:-0.303	0.763
Direct bilirubin	0.38 ± 0.08	0.38 ± 0.12	t:-0.253	0.801
Uric acid	3.45 ± 0.54	3.52 ± 0.49	t:-0.5	0.619
SGOT	54 (7 – 320)	22 (15 – 113)	t:-1.756	0.079
SGPT	23 (5 – 270)	15 (6 – 85)	t:-1.955	0.051
Pre-treatment β-HCG (1st day "mIU/mL")	4848 (1139-5739)	5200 (4829-6618)	Z:4.983	0.44

Using: t-Independent Sample t-test; Z-Mann-Whitney test

Table (3): Comparison between two studied groups according to HCG level (mIU/mL) post treatment.

HCG (mIU/mL)	Methotrexate group *(n=30)*	Laparoscopic salpingostomy group *(n=30)*	z-Test value	p-value
4th day	4710(2966-5678)	2183 (1137-3700)	-3.866	<0.001**
7th day	2340 (988-639)	435(231-639)	-4.259	<0.001**

Using: Z-Mann-Whitney test

Table (4): Comparison between two studied groups according to percent change in β-HCG subunit in 4th and 7th day.

Percent change	Methotrexate group *(n=30)*	Laparoscopic salpingostomy group *(n=30)*	x^2	p-value
4th day				
Increase	22 (73.3%)	1 (3.3%)	39.660	<0.001**
<15% decrease	5 (16.7%)	2 (6.7%)		
≥15% decrease	3 (10.0%)	27 (90.0%)		
7th day				
Increase	2 (6.7%)	2 (6.7%)	1.077	0.584
<15% decrease	3 (10.0%)	1 (3.3%)		

≥15% decrease	25 (83.3%)	27 (90.0%)		

Using: x^2: Chi-square test; p-value >0.05 is insignificant;

Table (5): Comparison between two studied groups regarding to persistence ectopic post treatment.

Parameter	Methotrexate group (n=30)	Laparoscopic salpingostomy group (n=30)	Test value	p-value
Persistence ectopic	5 (16.7%)	3 (10.0%)	x^2:0.572	0.449

Using: Z-Mann-Whitney test; x^2: Chi-square test;

Table (6): Laboratory investigations baseline and on follow up among methotrexate group.

Parameter	Methotrexate group		p
	Baseline	7th day	
	Mean ± SD	Mean ± SD	
Hemoglobin (g/dl)	10.56 ± 0.89	10.6 ± 0.87	0.326
WBCs (10^3/mm^3)	7.05 ± 0.96	7.08 ± 1.0	0.326
Platelet count(10^3/mm^3)	190.07 ± 68.44	182.93 ± 69.63	0.266
INR	1.022 ± 0.12	1.019 ± 0.119	0.326
Creatinine (mg/dl)	0.77 ± 0.28	0.75 ± 0.27	0.326
Direct bilirubin	0.38 ± 0.08	0.38 ± 0.08	0.999
Uric acid	3.45 ± 0.54	3.43 ± 0.55	0.326
Serum albumin (g/dl)	3.94 ± 0.44	3.57 ± 0.81	0.056
SGOT	54 (7 – 320)	38.5 (7 – 320)	0.317§
SGPT	23 (5 – 270)	23 (5 – 270)	0.317§

Using: Paired sample t test and §Wilcoxon signed rank test

Table (7): Comparison between two studied groups according to the patency ofipsilateral tube by HSGafter 8 weeks:

Tube patency	Methotrexate group *(n=30)*	Laparoscopic salpingostomy group *(n=30)*	Test value	p-value
Blocked	6 (20%)	16 (53.3%)	7.177	0.007*
Patent	24 (80%)	14 (46.7%)		

Using: x^2: Chi-square test;

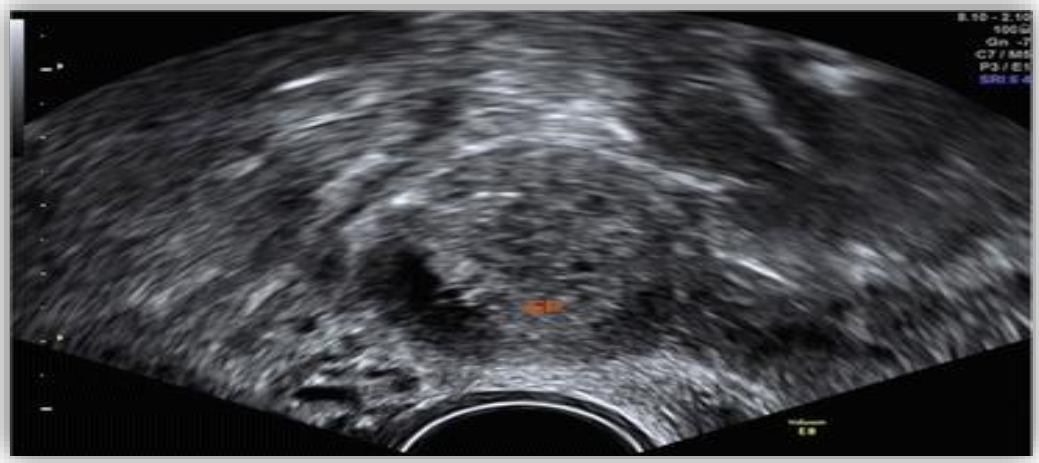

Figure (1):TVS: Tubal ectopic pregnancy. An Inhomogeneous mass

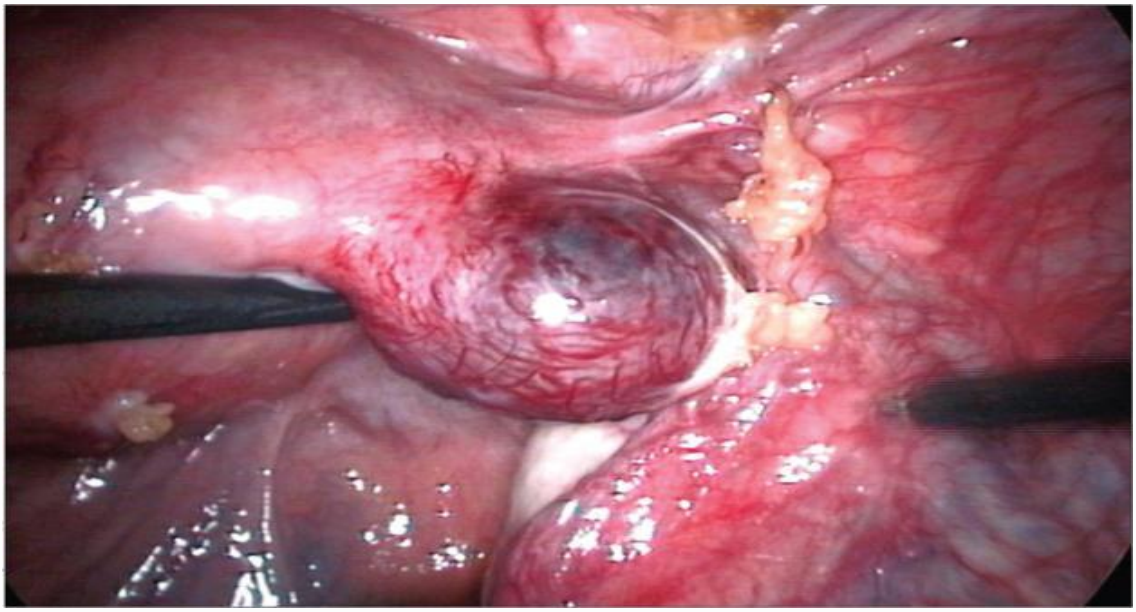

Figure (2): Laparoscopic view of undisturbed Tubal ectopic pregnancy.

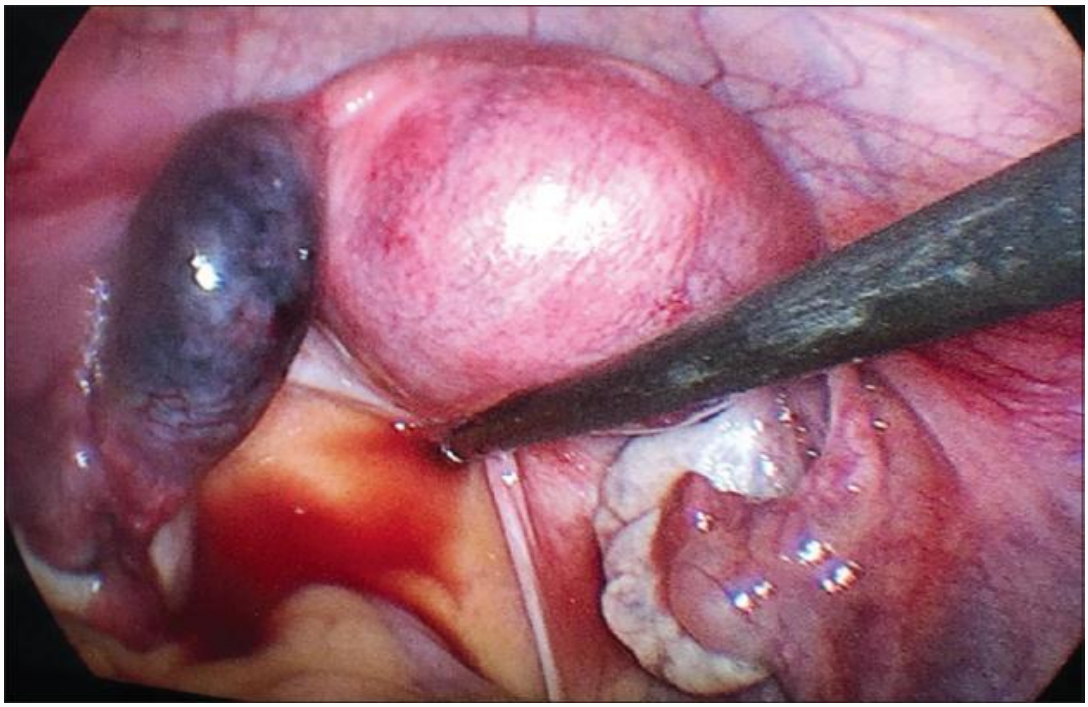

Figure (3): Laparoscopic view of undisturbed Tubal ectopic pregnancy.

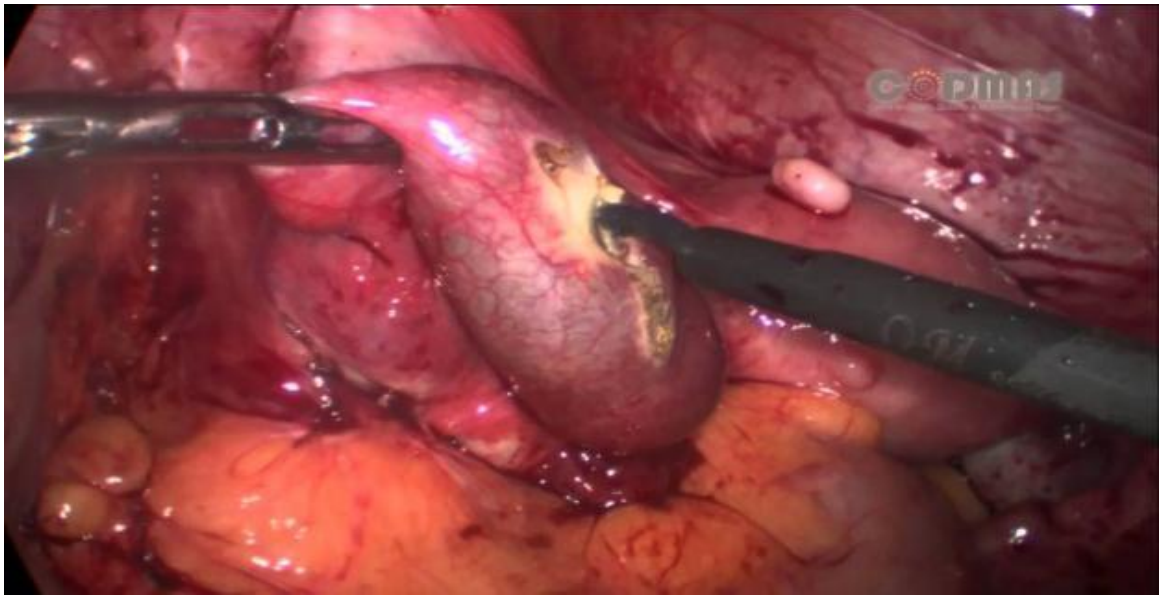

Figure (4) : laparoscopic salpingostomy for tubal ectopic pregnancy.

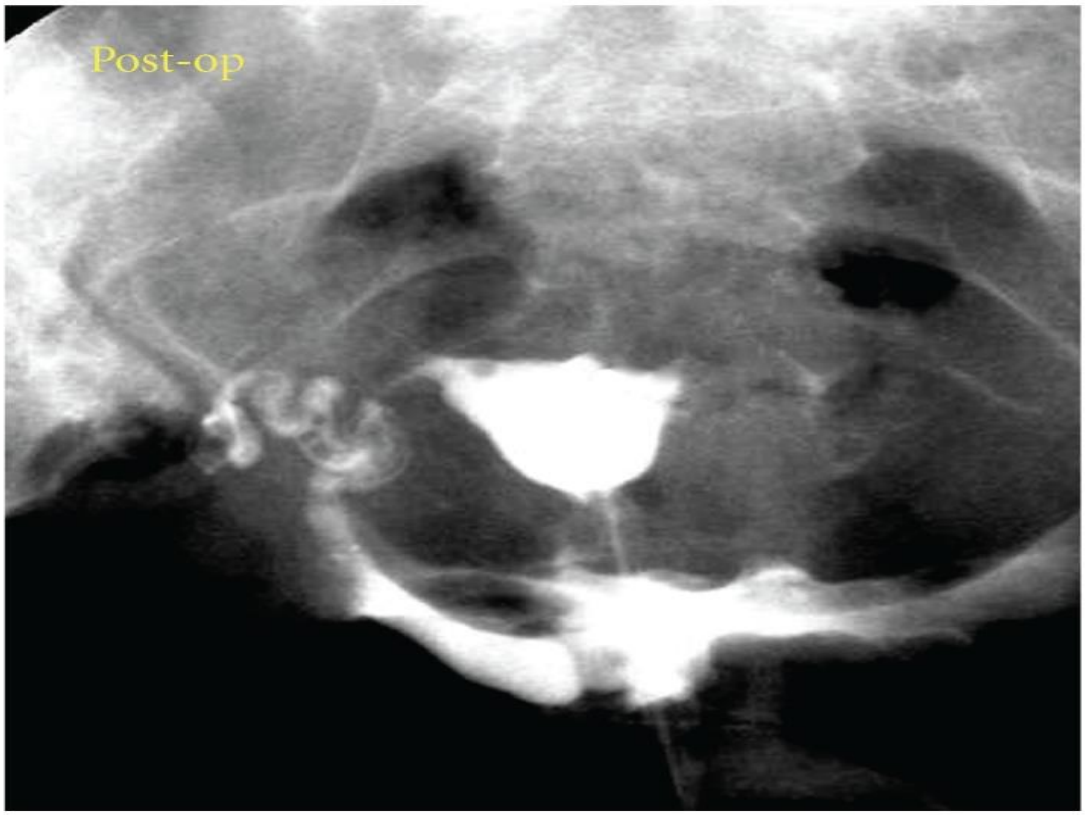

Figure (5) : normal HSG findingafter laparoscopic salpingostomy

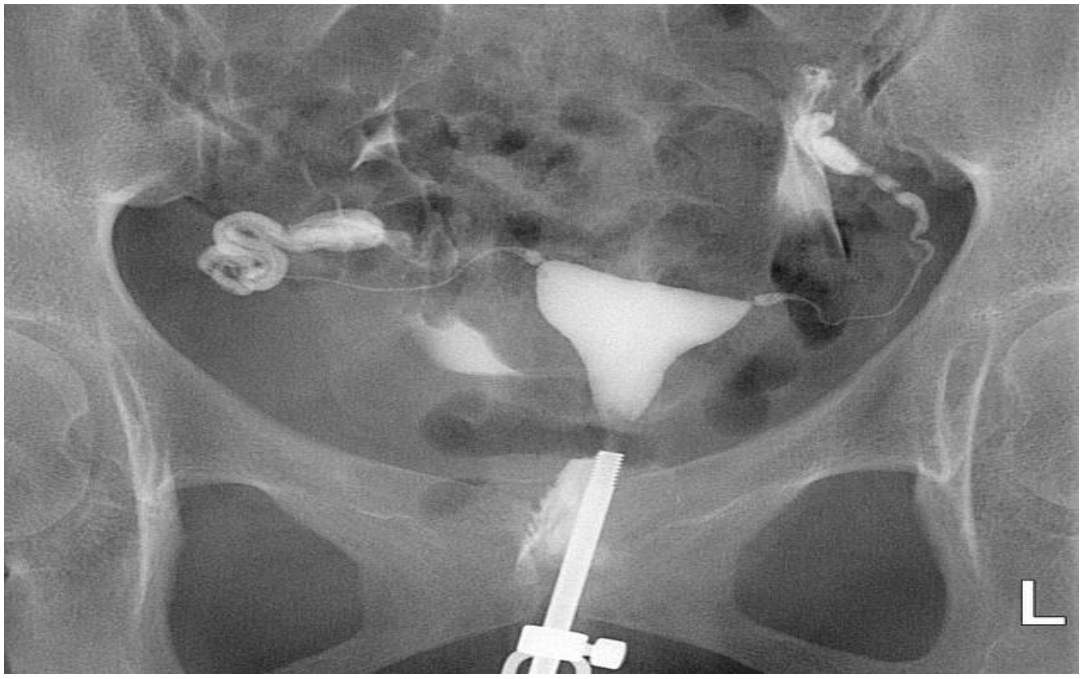

Figure (6) : normal HSG finding after laparoscopic salpingostomy

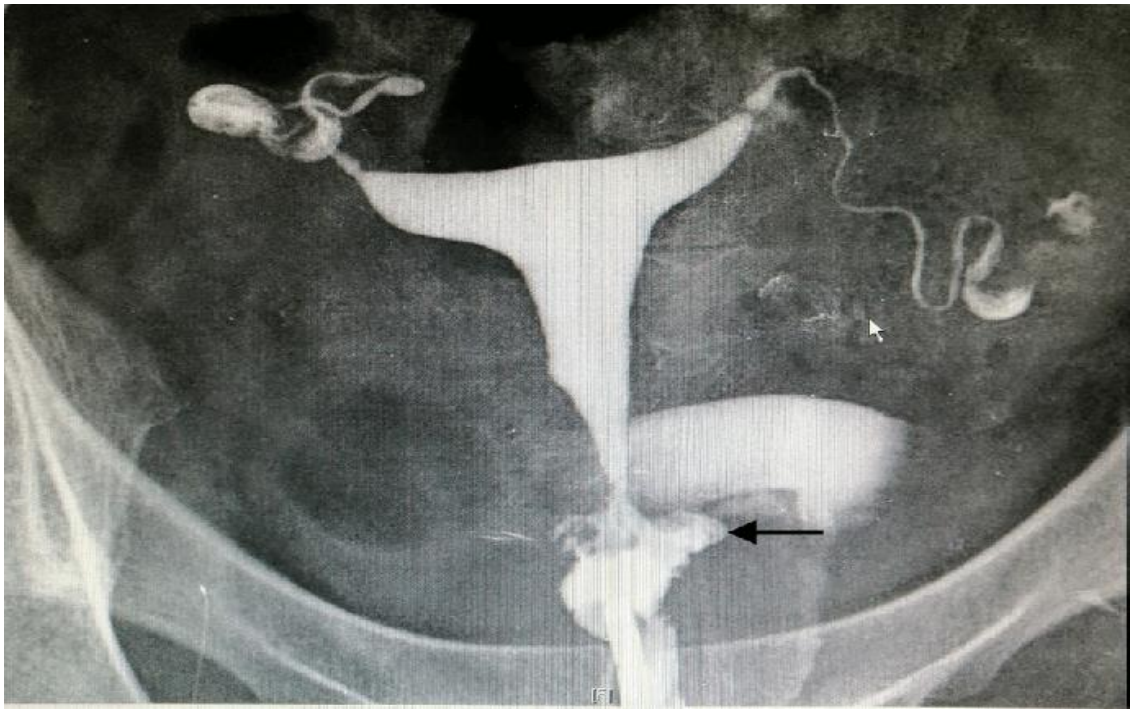

Figure (7) : post laparoscopic salpingostomy normal HSG finding

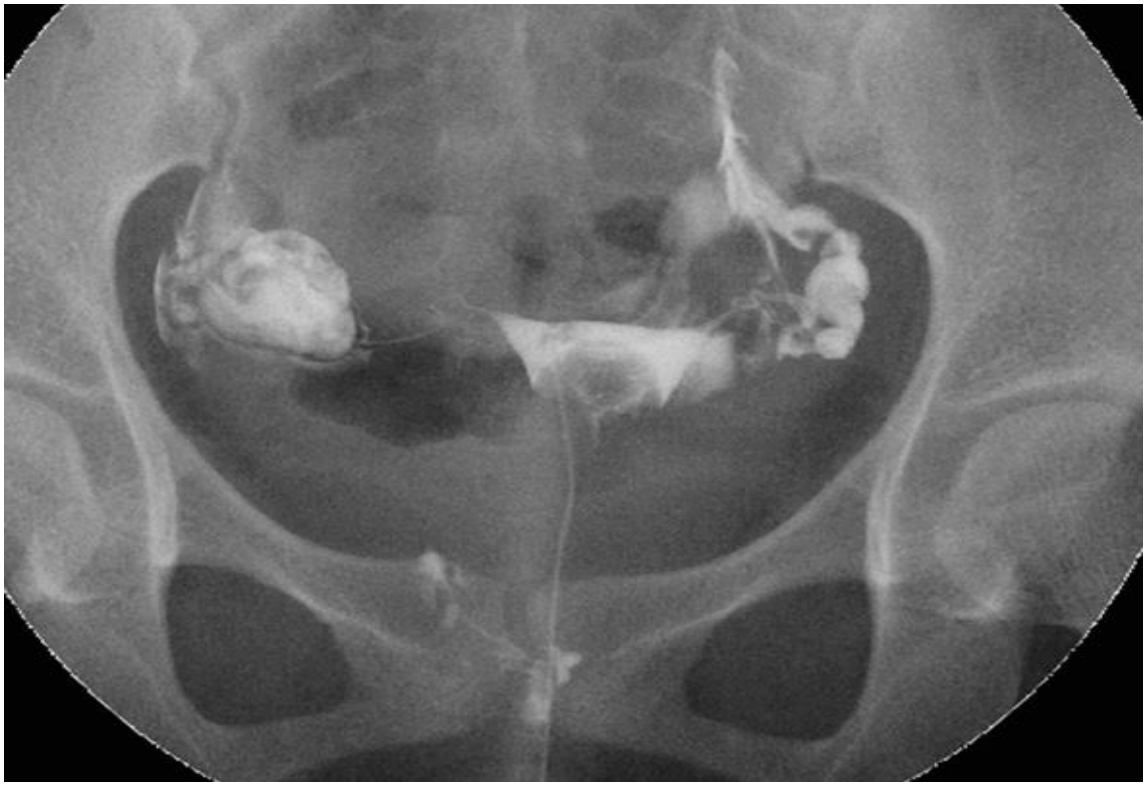

Figure (8) : normal HSG finding after laparoscopic salpingostomy

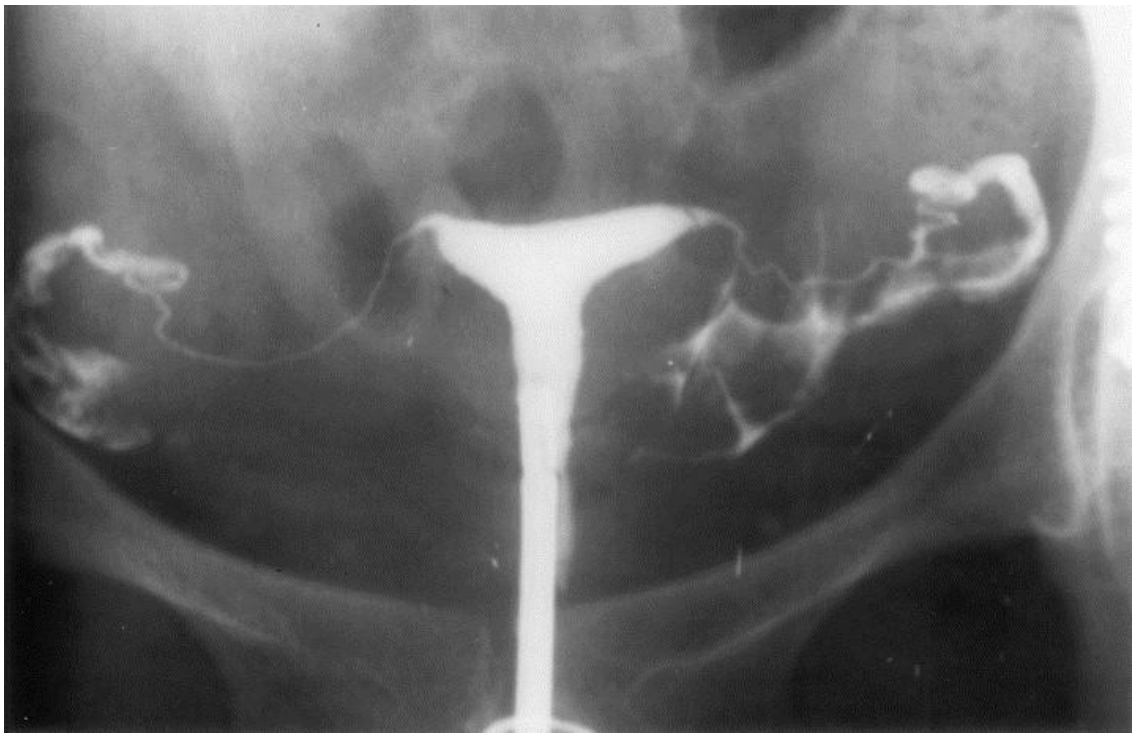

Figure (9) : normal HSG finding after methotrexate treatment

DISCUSSION

Our study reported that there was no statistically significant difference between study groups according to demographic data as age, BMI, gestational age, gravidity, parity, pain, bleeding and vital data and routine pretreatment

laboratory investigations 1st day β-HCG that was no statistically significant in laparoscopic salpingostomy group compared to methotrexate group 5200vs. 5100 mIU/m. In addition, there was a highly statistically significant higher β-HCG at 4th day and 7th day in methotrexate group compared to laparoscopic salpingostomy group 4710 vs. 2183 and 2340 vs. 435 respectively.

After treatment, there was a highly statistically significant higher frequency ≥15% decrease at 4th day in laparoscopic salpingostomy group compared to methotrexate group; while7thday insignificant difference between groups. Also, there was no statistically significant difference between groups according to ectopic persistence after day 7.

Finally, there was a statistically significant higher frequency of fallopian tubes patency in methotrexate group compared to laparoscopic salpingostomy group.

Khani et al. conducted a clinical trial study on 112 women, who were divided into 3 populated groups of laparoscopic salpingostomy, laparotomy and MTX. In Laparotomy surgery, a 10–15 mm incision was created at the antimesenteric margin on the EP after opening abdominal layers and ovarian expose. Pregnancy product often is removed from the incision site. Pregnancy products can be removed precisely or they can be removed using high pressure washing system, which causes more complete removal of trophoblastic tissue. Small bleeding sites were controlled by electro-coagulation of needle and incision site was left without stitching so that it recovered through secondary healing. They disagreed with us and stated that tubal patency had higher frequency in laparoscopy group compared with laparotomy and MTX, although, the difference was not statistically significant (P = 0.595) [6].

Eryılmaz et al. disagreed with us and stated that 1st day β-HCG was statistically significant higher in laparoscopic salpingostomy group compared to methotrexate group 5511.3±7293.0 vs. 670.5±1027.5 mIU/m. Also agreed with the decrease in β-HCG at discharge was higher in laparoscopic salpingostomy group compared to methotrexate group 869.7±599.1 vs. 352.3±627.0. In this study, 64 patients with ectopic pregnancy who had been administered an MTX therapy were compared with another 64 patients with matching ages who had undergone a laparoscopic salpingostomy. They found that MTX used as a medical treatment in ectopic pregnancy was as successful as a laparoscopic salpingostomy [7].

Mol et al. evaluated the effectiveness of surgery, medical treatment and expectant management of tubal ectopic pregnancy (EP) in terms of treatment success (i.e. complete elimination of trophoblast tissue), financial costs and future fertility. They agreed with us and stated that with systemic MTX in a fixed multiple dose i.m. regimen the likelihood of treatment success was higher than with laparoscopic salpingostomy (RR 1.15, 95% CI 0.93–1.43), but the difference was not significant. Subsequent fertility did not differ between the interventions studied[8].

Mohammed conducted a prospective study to evaluate the safety and efficacy of laparoscope versus MTX of well-selected cases of undisturbed ectopic pregnancy. Forty patients of undisturbed EPs were divided randomly into two groups (20 for each group), the first group included women undergoing laparoscopic salpingostomy and the second group included women undergoing MTX. They agreed with us regarding success rate and persistence of ectopic and stated that it was 70% in MTX group compared with 85% in laparoscopic group with no significant difference[2].

Hajenius et al. disagreed with us and stated that there was no difference between systemic methotrexate and laparoscopic salpingostomy regarding tubal patency. 100 patients were included in the trial. Of 51 patients allocated systemic methotrexate, 42 (82%) were successfully treated with one course; two (4%) patients needed a second course for persistent trophoblast. Surgical intervention was needed in seven (14%) patients; salpingectomy was necessary in five of these patients for tubal rupture. Of the 49 patients allocated laparoscopic salpingostomy, 35 (72%) were successfully treated by laparoscopic salpingostomy alone; salpingectomy was needed in four (8%) patients, and ten (20%) needed methotrexate for persistent trophoblast. The tube was preserved in 46 (90%) patients in the methotrexate group versus 45 (92%) in the salpingostomy group). Homolateral tubal patency could be assessed in 81 patients: the tube was patent in 23 (55%) of 42 patients in the methotrexate group and in 23 (59%) of 39 patients in the salpingostomy group[9].

Aboelroose et al. disagreed with us and stated that methotrexate provided successful fertility-preserving treatment for women with unruptured

ectopic pregnancy, yet associated with tubal block. It was a prospective cohort study conducted on fifty- six patients with unruptured tubal pregnancy. All patients were managed with medical treatment, methotrexate therapy. After confirmation of successful medical treatment, hysterosalpingography was done three months after treatment for the evaluation of tubal patency. The present study revealed that 71.4% of patients (40 cases) had patent tubes, and 28.6% had blocked tubes. Moreover, 21.4% of patients have ipsilateral tubal block only, 3.6% have a contralateral tubal block, and 3.6% have a bilateral tubal block[10] **.**

deBennetot et al. and colleagues agreed with us stated that conservative approach using either MTX or salpingostomy should be taken to preserve a woman's fertility without increasing her risk for recurrence. They showed that salpingectomy may result in lower fertility when compared with salpingostomy and MTX, with a spontaneous conception rate of 67% versus 76% and 76%, respectively[11].

Mol et al. When comparing laparoscopic salpingostomy versus MTX, a meta-analysis showed that systemic MTX is more cost-effective, with less hospitalization, faster recovery, and no significant difference in subsequent spontaneous conception rate or recurrent ectopic pregnancies[8]**.**

Oriol et al. Specifically within the infertility population, MTX has not been found to negatively impact ovarian reserve or performance during ovarian stimulation. Therefore, MTX therapy has become the treatment of choice for many physicians in the nonruptured hemodynamically stable ectopic pregnancy patient[12]**.**

Tawfik et al. compared between tubal patency after methotrexate & laparoscopic salpingostomy. The study included 72 patients equally divided into 2 main groups. First group included 36 cases treated by MXT therapy single or multiple doses. Second group included 36 cases treated by laparoscopic salpingostomy. They agreed with us and stated that methotrexate is better than laparoscopic salpingostomy in treating undisturbed tubal pregnancy. As regard to tubal patency, of 31 cases (86.1%) from 36 cases that treated by MTX were patent and 5 cases (13.9 %) were blocked. On the other side 21 cases (58.3 %) from 36 cases that treated by laparoscopic salpingostomy were patent and 15 cases (41.7 %) were blocked[4]

Soliman and Salem conducted a prospective randomized clinical trial to compare systemic methotrexate and laparoscopic salpingotomy in the treatment of undisturbed tubal ectopic pregnancy. One hundred patients were included in the trial. They disagreed with us and proved that, in hemodynamically stable patients with undisturbed tubal pregnancy, systemic methotrexate and laparoscopic salpingotomy were successful in treating the majority of cases. When fertility is of concern, laparoscopic salpingotomy is superior to methotrexate in the preservation of future fertility because laparoscopy performed for treatment of ectopic pregnancy enables better evaluation and correction of pelvic anatomy and avoidance of possible distortion of pelvic anatomy as it sometimes complicates methotrexate treatment (pelvic adhesions due to pelvic hematoma). Whenever future fertility is not the main concern, methotrexate is a good alternative to laparoscopy with the advantages of being noninvasive, free of surgical and anesthetic risks, cheap, and easy[13].

Finally, Baggio et al. compared fertility and reproductive outcome after surgical, medical, and expectant management for tubal ectopic pregnancy (EP). 133 of 228 patients, who were managed for a tubal EP, tried to conceive immediately after treatment: 86 out of 173 (49.7%) underwent surgical treatment; 38 (21.9%) were treated with methotrexate (MTX), and 49 (28.3%) had expectant management. They agreed with us and stated that women successfully managed by expectation appear to have better reproductive outcomes compared to women who underwent surgery, with the shortest time to achieve a subsequent intrauterine intrauterine clinical pregnancy (CP). Therefore, if safely applicable the expectant management should be considered in the case of tubal EP. The CI of intrauterine CP starting from 12 months after the EP was 65.3% for the expectant management, 55.3% for the MTX group, and 39.5% for surgery. Post-hoc analysis showed expectant management having higher intrauterine CP and live birth (LB), and shorter time between treatment and first intrauterine CP compared to surgery. The CI of recurrent EP was comparable between the 3 groups[14].

Conclusion: In cases of undisturbed ectopic pregnancy, conservative medical treatment with MTX is effective, safe, and less invasive with no significant adverse events compared with surgical interventions especially in selected

cases depending mainly on β-HCG low levels pre-therapeutic and follow up. In addition, whenever future fertility is the main concern, MTX is associated with better post treatment outcomes than laparoscopic salpingostomy regarding tubal patency.

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