

# Conservative surgical management of ectopic pregnancy and its role in preservation of future fertility



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## ABSTRACT

**Background:** Maternal Mortality is one of the most important issues in our country. Ectopic Gestation is one of the few reasons which contribute to it. The first successful surgical management of a tubal ruptured ectopic pregnancy occurred in 1883. In those times mortality was approximately 60%. Since then lot of development in management of ectopic pregnancy has taken place which has resulted in reduction of related mortality. But still it remains as one of the important topics as now due to more infections (i.e PID) and resulting ectopic gestations and further operative salpingectomies, there is a reduced chance of patient to conceive naturally afterwards. Hence role of conservative surgeries comes to the front.

**Aims and Objectives:** Role of Conservative Surgical Management of Ectopic pregnancy and its relation to future fertility. **Materials and Methods:** This Study was undertaken at GICE Clinic, Cure Hospital, Kalyani, West Bengal India from January, 2008 to January 2019. During this period 64 patients were diagnosed and operated for Ectopic pregnancy.

**Results:** Forty (62.5%) cases were in between 20-30 years of age. Forty-four (68.7%) cases had no issue. Forty-eight (75.0%) cases were from low socio-economic group. Sixty patients (93.7%) had the history of amenorrhea. It was also observed that history of induced abortion was in 20 (31.2%) cases, PID in 12 (18.7%) cases, appendectomy – 6 (9.4%) cases and history of previous IUCD insertion - 4 (6.3%) were found to be common amongst ectopic gestation cases. Twenty-four (37.5%) cases underwent linear salpingostomy, 8 (12.5%) cases had segmental resection with end to end anastomosis whereas 16 (25.0%) cases had salpingectomy and 16 (25.0%) cases had salpingo-opherectomy with tubectomy [opposite tube] were advocated. In 4(6.3%) cases of linear salpingostomy and 4 (6.3%) cases of segmental resection, the cases had to be re-operated again for unstable haemodynamic condition within 24 hours and were subsequently advocated to salpingectomy.

**Conclusion:** Linear Salpingostomy was found to be a better option for women who desire to become future mother, than that of segmental resection and salpingectomy on affected tube (although pregnancy was reported as opposite tube)

**Key words:** Ectopic pregnancy; Conservative surgery; Infertility

## INTRODUCTION

Ectopic gestation is one of the very important cause of maternal mortality. But due to improved standard of early diagnosis and treatment, maternal mortality from ectopic gestation has declined dramatically, but the prognosis for subsequent fertility has not been improved

so far. Recent improvement of diagnostic modalities<sup>1</sup> and micro- surgical technique has enabled a widespread use of conservative surgical approach to preserve the child bearing ability of women who deserve it. A conservative therapeutic approach should be attempted in every woman with an isthmic or ampullary tubal gestation who desires future fertility and is haemodynamically stable at time of

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admission.<sup>2</sup> The main goal to treat ectopic gestation by conservative surgical approach is to remove the product of conception while inflicting as little damage to the involved tube as possible.<sup>3</sup>

## MATERIALS AND METHODS

This study was undertaken at GICE clinic & Cure Hospital, Kalyani, West Bengal, India from January, 2008 to January 2019. During this period 64 patients were diagnosed and operated for Ectopic pregnancy.

### Pre-operative

In addition to history, a thorough clinical examination was performed to find out whether the patient is haemodynamically stable or unstable along with other important clinical parameters of patient to decide future course of action.

### Inclusion criteria

- Hemodynamically stable patients
- Isthmic or ampullary location of ectopic sac.

### Exclusion criteria

- Any other location of ectopic sac
- Any associated comorbidities
- Haemodynamically unstable patient.

### Notable findings

Choice of surgical techniques will depend upon by various factors to decide the type of operation –

- Condition of tube (ruptured or unruptured)
- location of the gestation sac within the tube (cornual, isthmus, ampulla)
- size of the gestation sac (< 4 cm, > 4 cm)
- condition of other tube
- presence of any adhesions
- presence or absence of uncontrollable bleeding
- Presence or absence of associated pelvic pathology.

### Choice of operation

Depending upon findings following procedures are advocated.

- Linear Salpingostomy- is performed for small (<4 cm), unruptured, isthmic or ampullary gestations.
- Segmental Resection- is done for a ruptured isthmic or ampullary gestation, but also has been recommended for unruptured isthmic and ampullary > 4 cm. size gestation sac or uncontrolled bleeding following linear salpingostomy.
- Salpingectomy- for rupture isthmic and ampullary gestation with uncontrolled bleeding.
- Salpinogo-Oophorectomy along with tubectomy on unaffected side- is usually advised for unruptured or

ruptured tube with severe adhesion or undiagnosed ovarian pregnancy in a multiparous woman.

### Post-operative

Patients who were undergone linear Salpingostomy, Segmental resection, and Salpingectomy cases were advised for oral contraceptives or a barrier method for 6 months. After 6 months when the patient had regular cycle and no other absolute contra- indication for pregnancy, were advised for future pregnancy, H. S. G. and/ or laparoscopy was advocated to see tubal patency in operative and non-operative site. Prospective Cohort Study was undertaken to find out the subsequent conception rate between linear salpingostomy and segmental resection in operative site.

## RESULTS

Table 1 shows that 40 (62.5%) cases were in between 20-30 years of age. Forty-four (68.7%) had no issue. Forty-eight (75.0%) cases were from low socio- economic group.

Sixty (93.7%) had the history of amenorrhea (Table 2). It is also observed that history of induced abortion 20 (31.2%), PID – 12 (18.7%), appendectomy – 6 (9.4%) and history of previous I. U. C. D. insertion – 4 (6.3%) were found to be common amongst ectopic gestation cases.

The laparotomy findings shown in Table 3, observed 30 (46.9%) patients had ruptured tube against 34 (53.1%) patients with unruptured tube. In regards to the position of sac, Ampullary 32(50.0%) and Isthmus 30(46.9%) region were the main position of ectopic gestation sac, while 2(3.1%) in corneal position was also seen. Size of gestation sac could not be ascertained in case of ruptured sac, whereas size of gestation sac (less than 4 cm) was found in 24(37.5%) patients and the size more than 4cm was noted in 10 (15.6%) patients of unruptured gestation sac.

**Table 1: Age, Parity and Socio-Economic Status (n=64)**

	Number	Percentage
Age		
< 20 years	4	6.3%
20 – 30 years	40	62.5%
>30 years	20	31.2%
Parity		
Nil	44	68.7%
1	12	18.7%
2	4	6.3%
3	4	6.3%
Socio-Economic Status		
Low	48	75.0%
Medium	12	18.7%
Higher	4	6.3%

**Table 2: Past Menstrual, Obstetrical, Gynaecological, Surgical and family planning history (n=64)**

History	Number	Percentage
1. Menstrual		
Amenorrhoea	60	93.7%
Irregular period	4	6.3%
2. Obstetrical		
Spontaneous Abortion	8	12.5%
Induced Abortion	20	31.2%
Post Cesarean Section	4	6.3%
3. Gynecological		
Pelvic inflammatory disease	12	18.7%
Genital Tuberculosis	4	6.3%
4. Surgical		
Appendectomy	6	9.4%
5. Family Planning		
I. U. C. D. insertion	4	6.3%
OCP	4	6.3%

**Table 3: Laparotomy findings (n=64)**

	Number	Percentage
A. Condition of the tube		
Ruptured	30	46.9%
Un- ruptured	34	53.1%
B. Position of Gestation sac		
Cornual	2	3.1%
Isthmus	30	46.9%
Ampulla	32	50.0%
C. Size of Gestation		
Unruptured		
< 4 cm	24	37.5%
>4 cm	10	15.6%
D. Uncontrollable bleeding		
Present	30	46.9%
Absent	34	53.1%
E. Presence of Adhesions		
On Affected Tube		
Yes	4	6.3%
No	64	93.7%
F. Condition of other tube		
Normal	58	90.6%
T. Omass	2	3.1%
Adhesion	4	6.3%
G. Associated Pelvic pathology		
Normal	60	93.7%
Uterine fibroid	4	6.3%

Uncontrollable bleeding was seen in 30(46.9%) cases while 34(53.1%) had absence of bleeding. Adhesion in 4(6.3%) cases on other tube and associated uterine fibroid in 4(6.3%) cases were also observed during laparotomy.

Linear Salpingostomy (Table 4) is preferably advocated in 24 cases (37.5%). Also successfully advocated when location of sac is situated at isthmus in 14(21.9%) cases and in ampullary location in 10(12.6%) cases. Segmental resection with end-to-end anastomosis was usually performed in unruptured cases i.e., 8(12.5%), in the isthmus location in 1 (3.1%) case and in ampullary region in 6(9.4%) cases.

Salpingectomy in the affected side is advocated in a ruptured gestation sac in 16 (25%) of cases, and in Isthmus i.e., 6 (9.4%) cases and ampullary in 10 (15.6%) cases specially in region of uncontrollable bleeding 16(25.0%). Linear salpingostomy, segmental resection and salpingectomy were performed in a woman who desire for a future child bearing.

In a multiparous woman who do not desire for future pregnancy, salpingo-oophorectomy on affected side and tubectomy on unaffected side was performed in ruptured gestation i.e. in 14(21.9%) of cases. Only one case (3.1%) with unruptured cornual gestation sac in absence of active bleeding had undergone such operation.

From Table 5 it appeared that 24(37.5%) cases underwent linear salpingostomy, 8(12.5%) cases had segmental resection with end to end anastomosis whereas 16 (25.0%) cases had salpingectomy and 16 (25.0%) cases had salpingo-oophorectomy with tubectomy [opposite tube] were advocated.

In 4 (6.3%) cases of linear salpingostomy and 4(6.3%) cases of segmental resection, the cases had to be re-operated again for unstable haemodynamic condition within 24 hours and were subsequently advocated to salpingectomy.

In Table 6, the rates of intrauterine pregnancy (In linear salpingostomy cases) were noted in 8(40%) cases which were found to be higher than that of segmental resection cases. It is interesting to note that in salpingectomy cases, intrauterine pregnancy was noted in 6(25%) cases and Repeat ectopic pregnancy in 4(8.3%) cases was seen also in non-operative tube. It was hence noted that more favorable reproductive outcome was observed in linear salpingostomy done for small unruptured gestations sac.

Subsequent conception rate following segmental resection were found to be absent in this study.

## DISCUSSION

The management of ectopic gestation by different surgical technique<sup>4</sup> is one of most important tasks for gynecologist to preserve child bearing ability of women who desires it.

The recent progress in diagnostic modalities like availability of ultrasound<sup>5</sup> and sensitive beta-hCG assays, has enabled early detection of ectopic gestation, when the patient is only minimally symptomatic. Because of these recent developments, treatment has shifted from an immediate lifesaving intervention, into conservative methods<sup>5</sup> of management for preserving fertility.

**Table 4: Types of Operation (n=64)**

	Linear Salpin-gostomy	Segmental resection with end-to-end Anastomosis	Salpingectomy	Salpingo- oopher-ectomy with tubec- tomy on other side
Condition of tube				
Ruptured	-	-	16 (25.0%)	14 (21.9%)
Unruptured	24 (37.5%)	8 (12.5%)	-	2 (3.1%)
Position of sac				
Cornual	-	-	-	1 (3.1%)
Isthmus	14 (21.9%)	2 (3.1%)	6 (9.4%)	8 (12.5%)
Ampulla	10 (15.6%)	6 (9.4%)	10 (15.6%)	6 (9.4%)
Size of Gestation				
<4 cm	24 (37.5%)	-	-	-
>4 cm	-	8 (12.5%)	-	-
Uncontrollable bleeding				
Present	-	-	16 (25.0%)	14 (21.9%)
Absent	24 (37.5%)	8 (12.5%)	-	2 (3.1%)

**Table 5: Immediate post-operative complication up to 72 hours (n=64)**

Types of operation	Haemodynamically stable	Haemodynamically unstable
1. Linear Salpingostomy	20 (31.2%)	4 (6.3%)
2. Segmental Resection	4 (6.3%)	4 (6.3%)
3. Saphingectomy	16 (25.0%)	-
4. Salpingo- opherectomy	16 (25.0%)	-

**Table 6: Pregnancy rates following linear Salpingostomy, Segmental resection and Salpingectomy**

	Number	Pregnancy	Ectopic
Linear Salpingostomy	20	8 (40%)	2 (10%)
Segmental Resection	4	-	-
Salpingectomy	16	6 (25%)	2 (8.3%)

In this study, patient from low socio-economic group 48(75.0%) with the history of primary infertility 44(68.7%) were the victims of such catastrophies. History of amenorrhoea in 60(93.7%) cases, induced abortion 20(31.2%) cases, P.I.D. – 12(18.7%), appendectomy 6(9.4%) and previous insertion of I.U.C.D.- 4(6.3%) were found to be common amongst ectopic gestation cases.

Diagnostic laparoscopy<sup>6</sup> should always be considered when unruptured early ectopic gestation sac is suspected in addition to other diagnostic protocols. During laparotomy, the choice of surgical technique will be determined by various considerations.

In this study it has been observed that condition of tube, whether ruptured [30 (46.9%) cases] or unruptured [34(53.1%) cases] and position of Gestation Sac = Either at cornual [2(3.1%)], Isthmus or Ampullary [32(50.0%)] region was found to be very important deciding factor for future course of action.

The size of gestation sac (unruptured tube) less than 4 cm = 24(37.5%) and more than 4 cm=10(15.6%) is also helpful for future conservative surgical approach. And this conservative surgical approach<sup>7</sup> is of paramount importance to remove the product of conception, while implicating a little damage to the involved tube as much possible for retaining future fertility potential.

Presence of uncontrollable bleeding [like noted in 30 (46.9%) cases] requires immediate surgical intervention to remove whole tube, while conservative approach is advocated in absence of uncontrollable bleeding that was noted in 34(53.1%) cases. Of course, other factors like presence of adhesion- 4(6.3%) on the affected tube, condition of other tube and associated pelvic pathology are also important decision-making factors before adopting different types of surgical management.

Linear salpingostomy is advocated in unruptured (24 [37.5%] cases) tube involving isthmus (14 [21.9%] cases) and ampullary region (10 [15.6%] cases) having gestation sac with less than 4 cm size in absence of uncontrolled bleeding.

Segmental resection with end-to-end anastomosis was performed in an unruptured (8 [12.5%] cases) tube involving isthmus (2 [3.1%] cases) and ampullary region with more than 4 cm gestation sac size (8 [12.5%] cases) in absence uncontrolled bleeding (8 [12.5%] cases).

Total salpingectomy on the affected size is usually done for ruptured tube (16 [25%] cases) having uncontrolled bleeding (16 [25%] cases) arising from isthmus 6 [9.4%] and ampullary 10 [15.6%] region of affected tube whereas salpingo-oophorectomy on the affected side along with tubectomy in an unaffected side.

Only 2 [3.1%] unruptured cornual gestation sac was operated by salpingo-oophorectomy along with tubectomy

in an unaffected side because of high risk of uncontrolled bleeding.<sup>8</sup>

Utmost precaution during conservative surgery is to be undertaken to control any sorts of active bleeding from operative site. In spite of adequate precaution, it was seen that in 4 cases of linear salpingostomy and 4 cases of segmental resection, were re-operated again in presence of un-controlled bleeding and had subsequently undergone salpingectomy.

All the patients who underwent conservative tubal surgery for an ectopic gestation will be allowed further pregnancy after 6 months of initial surgery when all others parameters were normal.<sup>9,10</sup>

It was found that subsequent pregnancy rate was found to be different in different groups. The rate of intrauterine pregnancy 8 [40%] following linear salpingostomy were found to be higher than that of segmental resection with end-to-end anastomosis and in total salpingectomy where pregnancy rate of 25% (i.e in 6 cases) and ectopic pregnancy in 8.3% of cases were observed in opposite tube.

The advantage of linear salpingostomy over segmental resection and salpingectomy becomes more significant when treating ectopic gestations in solitary tubes. Serial beta-HCG measurements along with other diagnostic modalities following conservative surgery is mandatory to rule out persistence of trophoblastic tissue.

## CONCLUSION

Linear Salpingostomy was found to be a better option for women who desires to become future mother, than that of segmental resection and salpingectomy on affected tube (although pregnancy was reported as opposite tube).

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### Author's contribution:

**ID-** Concept and Design of the study; Prepared draft of manuscript; reviewed results; **DKD-** Concept and design of study, Interpreted the results; review of literature, Statistical analysis **RBD-** Reviewed results, Statistical analysis

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