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Laparoscopic Management of Ectopic Pregnancy

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Abstract: **Approach for laparoscopic surgical management of Ectopic Pregnancy(EP) is exemplary. More recent evidence suggests that laparoscopic treatment is the safest and most effective for suitably trained and experienced staff.**
Aims and objective: The objective of current study was to evaluate numerous laparoscopic methods for treatment of tubal ectopic pregnancy.
Materials and Methods: A total of 22 patients with EP were enrolled and all were treated with laparoscopic procedure.
Results: Patient's age was 27 ± 17.68 years. Out of 22 patients, 6 patients were found with EP in isthmus, 12 patients were found with EP in ampullary, 3 patients were found with EP in fimbrial and 1 patient was found with EP in ovarian. Mean post-operative hospital stay in this study was observed 3 ± 2.83 days. Reasons for ruptured EP were due to infertility in 08 patients, tubal surgery in 02 patients, intrauterine devices (Cu-T) in 01 patient, abdomen pelvic tuberculosis in 08 patients and previous ectopic in 03 patients.
Conclusion: With adequate practice and surgical experience in operative endoscopy, most patients with EP possibly treated effectively by laparoscopy regardless of gestation size, location or existence of tubal rupture.

Keywords: **Ectopic Pregnancy, Laparoscopy.**

1. INTRODUCTION

Ectopic pregnancy [EP] is a pregnancy where fertilized ovum grafts other than the endometrial lining of the uterus.[1] As per the definition, ectopic pregnancy is one in which the fertilized egg becomes implanted at sites other than usual uterine cavity – sites which are not favorable to further growth and development of the fertilized egg.

Historically, EP were diagnosed and managed surgically in symptomatic women having symptoms: pain, vaginal bleeding and a history of amenorrhoea. In present scenario, with improvements in the use of diagnostic ultrasound and the rapid immunoassay of serum human chorionic gonadotrophin, it is possible to diagnose an EP at an earlier stage prior to treatment, and even manage them non-surgically using either an expectant or medical approach.[5]

In child-bearing age women, EP presents a major health problem. All risk factors are maternal which include tubal surgery, pelvic inflammatory disease, smoking, *chlamydia trachomatis* infection, induced conception cycle, and endometriosis.[2]

EP is assuming to be of greater importance because of its increasing incidence and its impact on women fertility.[3]

EP is the main cause of maternal deaths in early pregnancy. With respect to the treatment of EP, there has been remarkable technical advances. The early diagnosis and treatment of this condition compared to past two decades has increased a definitive medical management of unruptured EP even before there were clinical symptoms in these high risk women.[3]

EP not only leads to fetal wastage but also it leads to increase maternal morbidity and mortality and in many cases significantly compromises the future fertility of the patient.[4]

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The majority (95%) of EP happen in the fallopian tube. For the diagnosis, an ectopic mass should be seen in the adnexa separate to the ovary.

Transvaginal ultrasound (TVS) is now becoming the diagnostic technique of choice. It has been reported to have an overall sensitivity of 90.9–99.0% for the recognition of EP (1–3).[6]

The following may be visualized:[5]

Tubal:

(1) An inhomogeneous adnexal mass,

(2) An empty extra-uterine sac with a hyper-echoic ring or

(3) A yolk sac and/or fetal pole with or without cardiac activity in an extra-uterine sac.

Interstitial

- Vacant endometrial cavity with products of conception situated outside of the endometrial echo, surrounded by a continuous rim of myometrium, within the interstitial area.

Cervical

- Empty endometrial cavity.
- Gestational sac present below the level of the internal os. A negative ‘‘sliding sign’’ and visible blood flow around the gestation sac using colour doppler.

Caesarean section scar

- Empty of endometrial cavity.
- Cervical canal with a gestational sac fixed within the lower anterior segment of uterine wall, with evidence of myometrial dehiscence.

In current scenario, treatment options in cases of ectopic pregnancy are:[4]

- Surgical Treatment
- Surgically administered medical treatment
- Medical treatment
- Expectant Management

As the majority of EP are now diagnosed non-surgically, there has been an increasing trend to manage suitable cases either expectantly or medically.[6]

Expectant and medical management have been shown to be safe and effective in selected cases of ectopic pregnancy.[6]

Surgery is choice of action if

- hCG >1500 IU/L OR
- Visible EP sac with fetal cardiac activity OR
- Mass of greater than 35 mm.

In suitable conditions, surgery provides rapid confirmation of the detection with shorter resolution time of the EP thus avoiding prolonged nursing. Accurate assessment of the pelvis possible by surgery which is helpful for counselling. It is preferable to demonstrate an EP sac or adnexal mass on TVS prior to surgery.[7]

A laparoscopic approach to the surgical management of EP is preferred. Woman having haemodynamic uncertainty due to intraperitoneal haemorrhage should be managed by the most expedient surgical method to gain rapid haemostasis.

Without any indication for open or laparoscopic method for a woman in shock, laparotomy has traditionally been favoured.[7]

More recent evidence suggests that laparoscopic treatment is the safest and most effective for suitably trained and experienced staff. Salpingectomy is recommended for recurrent EP in the same fallopian tube, extensive damage to the involved tube, uncontrolled bleeding or for women who have completed childbearing. Salpingotomy is preferred in mostly those women who do not have a healthy contralateral tube.

Laparoscopic surgery involves a very minor incision, a small camera, and no damage to fallopian tube. Surgeons usually prefer to use this type of method rather than doing surgery with a larger incision. But sometimes it may not possible. If tube has ruptured or been severely damaged and severe bleeding, probably needs emergency surgery with the larger incision. In these type of situations, the surgeons might remove fallopian tube.[8]

Types of Laparoscopic surgery:

- Electro coagulation,
- MTX, inj. Under laparoscopic vision,
- Milking of ectopic,
- Salphingotomy,
- Salphingectomy

The objective of current study was to evaluate various laparoscopic methods for management of tubal ectopic pregnancy.

2. MATERIALS AND METHODS

Study was conducted in the Department of surgery, St. Jude's Hospital, Jhansi, India.

Consent was obtained from patient prior to enrollment in study. Total 71 patients were enrolled from September 2005 to February 2008. Out of 71 enrolled patients; 49(69.1%) were undergone open procedure whereas 22(30.9%) were undergone laparoscopic procedure.

Out of 22 patients who undergone laparoscopic procedure, 6 patients were having ectopic gestation at isthmus, 12 patients were having ectopic gestation at ampullary, 3 patients were having ectopic gestation at fimbrial and 1 patient was having ectopic gestation at ovarian.

Out of 22 patients 3 patients were with unruptured ectopic gestation whereas 19 patients were with ruptured gestation.

Retrospective data of age, site of ectopic gestation, types of laparoscopy performed, laparoscopic management of ruptured ectopic and post-operative stay were recorded for all patient.

General anesthesia were given to patient for the surgeries.

The decision as to the specific operative procedure was made by the surgeon based on operative findings and the patient's desire for future fertility. Electro coagulation, MTX - Injection under laparoscopic vision, Milking of the ectopic, Salphingotomy and Salphingectomy were laparoscopic procedures performed. Linear salpingostomy was the choice of procedure if the patient desired future fertility and tubal damage did not preclude this procedure. Salpingectomy was performed if there was severe tubal damage. One patient was undergone Electro coagulation, one patient was undergone MTX - Injection under laparoscopic vision, two patients were undergone Milking of ectopic procedure, ten patients were undergone Salphingotomy and eight patients undergone Salphingectomy.

Laparoscopic Procedure

Laparoscopy was performed in all patients of ectopic gestation and the findings of imaging were confirmed. Whole pelvic area was inspected in patients of non-ruptured ectopic gestation. Bipolar electrocoagulation was also performed. Methotrexate was injected under laparoscopic vision in other patient of non-ruptured tubal ectopic gestation. Blood and blood clots were sucked out in patients of ruptured ectopic gestation and site of ectopic gestation evaluated haemostasis was maintained. In 2 patients of ectopic gestation at fimbriel end, the conception was squeezed out and haemostasis was

maintained. In 10 patients of ruptured tubal gestation where tubes were not much distorted and/or patients willing for further conception laparoscopic salphingotomy was performed after injecting saline with adrenaline to prevent bleeding and salphingotomy was performed monopolar cautery hook. Conception was evacuated with saline jet dissection. Haemostasis was maintained if any patient with bipolar coagulation. Those patients with distorted tubes and/or had completed her family laparoscopic, salphingectomy was performed with the help of bipolar coagulation and cutting cautery. Through lavage of peritoneal cavity was performed with cupious amount of saline in ruptured ectopic gestation. A drain was put in situ and ports were closed.

3. RESULTS AND DISCUSSION

Table 1: Patient Characteristics

Parameter	Data
Age (Years)	27 ± 17.68 (15 to 40)
Post-operative stay (Days)	3 ± 2.83 (1 to 5)
Site of Ectopic gestation	Isthmus = 6 Ampullary = 12 Fimbrial = 3 Ovarian = 1
Types of laparoscopy performed	Electro coagulation = 01, Methotrexate (MTX) - Injection under laparoscopic vision = 01, Milking of ectopic = 02, Salphingotomy = 10, Salphingectomy = 08
Laparoscopic management of ectopic gestation	Unruptured Ectopic = 03, Ruptured Ectopic = 19
Reasons of ruptured ectopic	Infertility = 08, Tubal surgery = 02, Intrauterine devices (Cu-T) = 01, Abdomen pelvic tuberculosis = 08, Previous ectopic = 03

Mean post-operative hospital stay in this study was observed 3 ± 2.83 days (1 to 5). Similar type of results were found by B. S. Duggal et al.[9] where mean hospital stay for laparotomy was 7 days whereas it was 2 to 3 days for laparoscopy. As per S. Jahan et al.[10] and C. M. Yan et al.[11] post-operative time for hospital stay was shorter for laparoscopy method as compared to laparotomy. Similar results were found by D. C. Ding et al.[12] that post operative stay for laparoscopy was 2.7±0.6 days however for laparotomy was 3.2±1.1 days. It has been found that post-operative hospital stay of patients were less for laparoscopy as compared to laparotomy.

According to this study, 6 patients were found with EP in isthmus, 12 patients were found with EP in ampullary, 3 patients were found with EP in fimbrial and 1 patient was found with EP in ovarian. Similarly, as per C. Banz et al[13], On the right side we found 70.6% ampullary, 20.8% isthmic, and 8.6% fimbrial ectopic pregnancies. On the left side there were 61.8% ampullary, 25.5% istmic, and 12.7% fimbrial ectopic pregnancies. As per J. B. Dubuisson et al[14] EP was

located in the ampulla (124 patients, 85.5%), isthmus (17 patients, 11.7%) or the fimbrial end (four patients, 2.8%). According to all the data found from other articles as well as from this study, commonly EP located at fallopian tube, predominantly the ampullary region of the fallopian tube. Implantation (outside the fallopian tube) in the organs like abdominal cavity, ovary, myometrium, cervix, interstitial (i.e., intramuscular/proximal) portion of the fallopian tube or coincidentally with an intrauterine pregnancy occurs in less than 10 % of EPs.

As per the current study, laparoscopy was performed by electro coagulation in 01 patient, MTX - injection inder laparoscopic vision in 01 patient, milking of ectopic in 02 patients, salphingotomy in 10 patients and salphingectomy in 08 patients. In study done by B. S. Duggal et al.[9] of the 52 patients, 30 were treated laparoscopically and 22 patients underwent laparotomy. Out of these 22 patients, only 5 patients were haemodynamically not stable and an emergency laparotomy and salpingectomy was performed. One patient was on medical management with methotrexate and on second day had acute pain in abdomen and developed features of haemorrhagic shock. As per E. Kirk et al.[6], of the 11 women with failed expectant management, six were successfully treated with methotrexate, two received methotrexate but subsequently required laparoscopic salpingectomies and three underwent surgery – two laparoscopic salpingectomies and one diagnostic laparoscopy that confirmed a tubal miscarriage. According to study done by S. Mufti et al.[4] 65.78% case were treated by salpingestomy, 8.7 % cases were treated with partial salpingestomy, 21.05% cases were treated with salpingostomy, 2.63% cases were treated with milking of tube and 0.87% cases were treated with medical treatment - methotrexate. According to different studies, it has been detected that treatment options in cases of ectopic pregnancy are l Surgical Treatment, Surgically administered medical treatment, Medical treatment, and Expectant Management.

As per this study, 3 patients were found with unruptured ectopic laparoscopic management where as 19 patients were found with ruptured ectopic laparoscopic management. Similarly, as per S. Mufti et al.[4] out of 113 patients, 35.08% were found with unruptured tubal acuity of ectopic, 60.52% patients were found with ruptured tubal.

According to R. A. Gaddagi et al.[3] following cases were found:

Wills and Mohambal et al.:

Unruptured cases: 34%

Ruptured cases: 66%

Savitha Devi et al.:

Unruptured cases: 69.23%

Ruptured cases: 30.77%

Current study:

Unruptured cases: 13.64%

Ruptured cases: 86.36%

According to this study, reasons for ruptured EP were due to infertility in 08 patients, tubal surgery in 02 patients, intrauterine devices (Cu-T) in 01 patient, abdomen pelvic tuberculosis in 08 patients and previous ectopic in 03 patients. Similarly as per clinical practice guideline[7] the risk of EP increases 2-fold for infertility, 3-fold for tubal pathology and 4-fold for documented salpingitis. It has been observed that 1/3 part of the pregnancies in women who have been sterilised and ½ part of pregnancies in women with a LNG-IUS are ectopic. The risk of recurrence is approximately 10% for women with one previous EP and at least 25% for women having two or more previous EP's. Similarly in study by . Mufti et al.[4] Most of the patients i.e. 60.52% were diagnosed as ruptured ectopic and 55.32% had identifiable risk factors like previous D&C for abortion (21.05%), PID (10.01%) and infertility (8.77%). According to R. A. Gaddagi et al.[3], there is no risk factor for 37.83%; prior history of tubectomy in 16.21% cases; history of infertility (primary or secondary) in 16.21% cases; history of D and C in 18.91% cases; Cu-T each; 1 case conceived while she was on OCP, but she gives a history of missed pills; and a history of previous ectopic pregnancy and appendectomy were seen in 2.7% each. PID history and previous LSCS were also establish in 8.1% of the cases each. According to P Rana et al.[2], major track and significant cause of morbidity and mortality with associated risks of tubal rupture and intra abdominal hemorrhage in women. It can lead to substantial future reproductive morbidity, which include but not limited to subsequent ectopic

pregnancy and infertility. From above studies of different authors, it has been observed that due to many reasons listed above, patient may develop ruptured EP.

4. CONCLUSION

With adequate practice and surgical experience in operative endoscopy, most patients with ectopic pregnancies can be treated successfully by laparoscopy regardless of gestation size, location or presence of tubal rupture.

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