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Original Article

Surgical Precision — Laparoscopy's Edge in Ectopic Pregnancy Treatment

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ABSTRACT

Introduction: *There is a widespread belief that salpingostomy is the treatment of choice for ectopic pregnancy. The ability to treat most ectopic pregnancies via a laparoscopic approach has been a major advance in gynecological surgery. Although it is clear that laparoscopic treatments are preferable to laparotomy there is no consensus on whether salpingectomy or salpingostomy should be performed, despite over 40 years of research since the introduction of conservative tubal treatment.* ***Methods and Materials:*** *This retrospective single-center clinical study was conducted in a private Hospital, Cumilla, Bangladesh, from January 2022 to June 2023.* ***Results:*** *This minimally invasive technique demonstrated exceptional efficacy and safety in the cohort of 17 patients, aged 18-38, with suspected ectopic pregnancies. The consistent success of laparoscopic salpingectomy, regardless of pregnancy history or ectopic site is noteworthy. The advantages of laparoscopy were evident in the absence of major complications or wound infections. Furthermore, the prompt recovery, as evidenced by the timely removal of the drain tube and stitches, underscores the benefits of this approach. The remarkable outcome of two patients conceiving post-salpingectomy adds an additional layer of significance to the laparoscopic technique.* ***Conclusion:*** *Our study reaffirms that laparoscopy stands as the superior approach in the treatment of ectopic pregnancies. Its minimally invasive nature, coupled with its precision and excellent postoperative outcomes, position it as the gold standard for this critical condition.*

Keywords: *Ectopic pregnancy, laparoscopy, laparotomy, salpingectomy, gynecology*

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INTRODUCTION

Ectopic pregnancy is a potentially life-threatening condition in which a fertilized egg implants itself outside the uterus, usually in a fallopian tube. Prompt and effective treatment is crucial to safeguard the health and well-being of the mother [1]. One of the most advanced and precise methods for managing ectopic pregnancies is laparoscopic surgery. This minimally invasive technique has revolutionized the field of gynecology and provides a safer, quicker, and more precise approach to ectopic pregnancy treatment [2]. Before delving into the merits of laparoscopy, it is important to grasp the severity and implications of ectopic pregnancies [3]. According to the American College of Obstetricians and Gynecologists (ACOG), ectopic pregnancies occur in about 1 out of every 50 pregnancies [4]. They pose a significant risk to the mother as the fertilized egg cannot develop normally outside the uterus and can lead to life-threatening complications like internal bleeding. Historically, the standard method for treating ectopic pregnancies was through an open abdominal surgery known as a laparotomy [5]. This involved making a large incision in the abdominal wall, providing direct access to the reproductive organs. While effective, laparotomies are associated with longer hospital stays, increased post-operative pain, and extended recovery times [6]. Laparoscopic surgery, often referred to as minimally invasive surgery, represents a paradigm shift in gynecological procedures. It involves making small incisions through which specialized instruments and a camera-equipped laparoscope are inserted. The laparoscope transmits high-definition images to a monitor, allowing the surgeon to navigate and perform the procedure with precision [7]. One of the primary advantages of laparoscopy is the minimal trauma it inflicts on the patient's body. Unlike laparotomies, which require a large incision, laparoscopic surgery involves small, strategically placed incisions. This reduces blood loss, post-operative pain, and the risk of infection. Additionally, smaller incisions lead to less scarring, enhancing both the aesthetic outcome and the patient's psychological well-being [8]. Due to the reduced trauma and smaller incisions, patients who undergo laparoscopic ectopic pregnancy treatment typically experience shorter hospital stays and quicker recovery times compared to those who undergo laparotomies [9]. This means that individuals can return to their normal activities sooner, including caring for their families and resuming work. The laparoscope provides surgeons with a magnified, three-dimensional view of the reproductive organs [10]. This unparalleled visualization allows for precise identification and removal of the ectopic pregnancy. The surgeon can maneuver with great accuracy, minimizing the risk of damage to surrounding tissues. With laparoscopy, the risk of complications such as infection, adhesions, and hernias is significantly lower compared to open surgeries. This is because the procedure involves smaller incisions, which are less prone to infection, and reduced tissue handling [11]. In laparoscopic surgery, the specialized instruments used are designed to minimize bleeding. Additionally, the enhanced visualization provided by the laparoscope allows the surgeon to identify and control bleeding more effectively [12]. As a result, laparoscopy is associated with lower intraoperative and postoperative

blood loss compared to traditional open surgeries. A comparative study conducted by the American Journal of Obstetrics and Gynecology followed 300 patients diagnosed with ectopic pregnancies [13-14]. Half of the patients underwent laparoscopic surgery, while the other half underwent laparotomies. The laparoscopic group had an average hospital stay of 1.8 days, compared to 3.5 days for the laparotomy group. Besides, post-operative pain scores were significantly lower in the laparoscopic group. The laparoscopy group returned to normal activities, including work, in an average of 10 days, while the laparotomy group took an average of 21 days.

METHODS & MATERIALS

This retrospective single center clinical study was conducted in a private hospital in Cumilla, Bangladesh, from January 2022 to June 2023.

Inclusion criteria:

Patients with age 18-45 years old, failed medical management, confirmed ectopic pregnancy on ultrasound, giving consent and having signed the consent form for study and educational purpose.

Exclusion criteria:

Patients with co-morbidities, e.g. hypertension, heart disease, peptic ulcer etc., heterotopic pregnancy.

The study group consisted of 17 women who underwent laparoscopic surgery due to ectopic pregnancy. The diagnosis was based on the patient's history, gynecological examination, transvaginal ultrasound findings and β hCG concentration. Laparoscopy was performed typically in general anesthesia with Halothane and Nitrous oxide. The independent Ethics Committee of this institute approved the study, and a predesigned data collection form collected all data.

RESULTS

17 patients, aged 18–38 (average 28 age), hospitalized due to ectopic pregnancy suspicion, were included in the study**.** 12 patients were with history of previous LSCS and 4 patients had their previous delivery in the vaginal route. Only one patient was in the first pregnancy case.

Table I: Demographic and previous pregnancy history of the patients (n=17)

Patients No	Patient's Age	Para	Gravida
1	18	nil	primi
2	20	1+0 (LSCS)	2nd
3	20	1+0 (LSCS)	2nd
4	20	1+0 (LSCS)	2nd
5	22	P - 1+0 (LSCS)	2nd
6	22	1+0 (LSCS)	2nd
7	22	1+0 (VD)	2nd
8	22	1+0 (VD)	2nd
9	23	2+0 (VD)	3rd
10	23	2+0 (LSCS)	3rd
11	23	2+0 (LSCS)	3rd
12	25	1+0 (LSCS)	2nd

13	25	2+0 (LSCS)	3rd
14	25	2+0 (2 LSCS)	3rd
15	27	1+0 (LSCS)	2nd
16	35	3+0 (VD)	4th
17	38	2+0 (LSCS)	3rd

We found 5 patients with left sided tubal ectopic pregnancy whereas, 10 patients were diagnosed with the right sided tubal ectopic pregnancy.

Table II: Diagnosis outcomes of the patients (n=17)

Diagnosis information			
Left-sided tubal ectopic pregnancy (LTEP)		Right-sided tubal ectopic pregnancy (RTEP)	
Left sided rupture TEP	3p	Right sided TEP	5p
Left sided rupture TEP (Chronic)	1p	Right sided rupture TEP	5p
Left sided chronic TEP	1p	Right sided chronic TEP	2p

**p=patient, TEP= tubal ectopic pregnancy*

Laparoscopic salpingectomy was done for all the patients and 2 patients subsequently conceived after salpingectomy.

Table III: Treatment performed towards patients' need (n=17)

Treatments performed according to patient's circumstances	
Left sided salpingectomy	Right sided salpingectomy
4	13

Maximum patients (10) required 1 unit (450 ml) blood, however, three patients required 3 units (1450ml) blood and rest four patients became fine by 2 units (900ml) blood transfusion.

Table IV: Requirement of Blood transfusion (n=17)

Blood transfusion unit (450 ml)	**Patient's count**
1 units	10
2 units	4
3 units	3

Drain tube was kept in situ before the discharge of the patient and allowed to take shower on 3rd to 4th Postoperative

day. Besides, stitch off was done on 7th Postoperative day. No major complications and wound infection was detected among the patients.

Table V: Hospital stay period after treatment (n=17)

Discharge status of the patients	
Discharged within 24 hours	15 patients
Discharged within 48 hours	2 patients

DISCUSSION

Our study evaluated the outcomes of 17 patients, with an average age of 28, who were hospitalized due to suspected ectopic pregnancy. Out of these, 12 patients were with history of previous LSCS and 4 patients had their previous delivery in the vaginal route. Notably, only one patient was experiencing her first pregnancy. In terms of ectopic pregnancy location, 5 patients were diagnosed with left-sided tubal ectopic pregnancy, while 10 patients had right-sided tubal ectopic pregnancy. All patients underwent laparoscopic salpingectomy, a procedure in which the affected fallopian tube is removed. Remarkably, two patients were able to conceive after undergoing salpingectomy. The laparoscopic approach for most cases of ectopic pregnancy and salpingectomy is preferred over salpingostomy if the contralateral tube is healthy [15]. In our study, a notable postoperative practice was the placement of a drain tube, which was retained until the patient's discharge. This is a common precautionary measure to prevent the accumulation of fluids in the surgical area. Patients were allowed to shower on the 3rd to 4th postoperative day, indicating a relatively swift recovery. Furthermore, stitch removal was performed on the 7th postoperative day, indicating that the incisions were healing well without any complications. Importantly, the study reported no major complications or wound infections among the patients, highlighting the effectiveness and safety of the procedures performed. It was almost half a century, in 1973 that Shapiro and Adler described laparoscopic management of ectopic pregnancy [16]. Since then the technical advancement in the field of minimal access surgery has greatly enhanced the possibility of both diagnosing and treating ectopic pregnancy effectively [17]. As it offers advantage over laparotomy, now it has become the standard of care in the management of ectopic pregnancy [18]. Not only is salpingectomy considered a treatment option, but surgical interventions like salpingostomy and salpingotomy which offer the advantage of preservation of the fallopian tube are gaining popularity as treatment options [19]. Our study provides valuable insights into the management of ectopic pregnancies, particularly with regards to the choice of surgical approach and the subsequent outcomes. The utilization of laparoscopic salpingectomy appears to be a successful method in this cohort, with the added benefit of enabling subsequent pregnancies in some cases. The absence of major complications and wound infections further underscores the proficiency and expertise of the surgical team. It is worth noting that the sample size of 17 patients may be considered relatively small, and further studies with larger cohorts may be beneficial in corroborating these findings. Nonetheless, this study contributes significantly to the

existing body of knowledge on ectopic pregnancy treatment. Thus, with adequate experience in laparoscopy, i.e., with an experienced laparoscopic surgeon and with proper instruments, most if not all of the patients with ectopic pregnancy can be treated successfully, whatever the gestation size or location, the number of gestations, or the presence of tubal rupture as seen in the other studies [20].

CONCLUSION

In the realm of gynecological surgery, laparoscopy has emerged as the gold standard for ectopic pregnancy treatment. Its precision, minimal invasiveness, and swift recovery times make it an invaluable tool in the hands of skilled gynecological surgeons. As advancements in laparoscopic technology continue, we can expect even greater refinement in the treatment of ectopic pregnancies, further ensuring the safety and well-being of mothers facing this critical condition.

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