

A Descriptive Analysis of Patients Presenting with Ectopic Pregnancy at SCB Medical College Hospital, Cuttack

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Abstract:

Background: Ectopic pregnancy is a major obstetric emergency and an important cause of first-trimester maternal morbidity and mortality, particularly in developing countries where delayed diagnosis frequently results in tubal rupture and hemodynamic instability. Early recognition of its clinical presentation and associated risk factors is essential for timely diagnosis, appropriate management, and preservation of future fertility. So this study was aimed to evaluate the incidence, clinical profile, risk factors, management strategies, and outcomes of women presenting with ectopic pregnancy at a tertiary care hospital.

Methods: A hospital-based cross-sectional observational study was conducted at SCB Medical College Hospital, Cuttack from April 2023 to March 2024. A total of 200 women with clinically, radiologically, or surgically confirmed ectopic pregnancies were included in this study. Demographic characteristics, presenting symptoms, clinical findings, laboratory investigations, ultrasonographic features, risk factors, treatment modalities, operative findings, and postoperative outcomes were analysed using SPSS version 21.0. Descriptive statistics were used to summarize the findings.

Results: Most cases (80%) were aged 20–30 years, with a mean age of 28 years, and 73% cases were multiparous. Amenorrhea (88%), abdominal pain (87%), and vaginal bleeding (58%) were the predominant presenting symptoms. Pallor (57%) and abdominal tenderness (55.5%) were the commonest clinical signs. Ultrasonography demonstrated an echogenic adnexal mass in 68%, an empty uterus in 66.5%, and free fluid in the pouch of Douglas in 50% of cases. Previous abdominal or pelvic surgery (31.5%), genital infections (28.5%), multiple sexual partners (26.5%), IUCD use (22.5%), and pelvic inflammatory disease (20%) were the leading risk factors. Ruptured ectopic pregnancy accounted for 72.5% of cases. Surgical management was performed in 99% of cases, predominantly by laparotomy, while only 1% case received medical management with methotrexate. The ampullary region was the commonest site of implantation (65%). Blood transfusion was required in 51.7% of cases, ICU admission in 3.5% cases, and maternal mortality was 1% case.

Conclusion: Ectopic pregnancy remains a significant cause of maternal morbidity due to delayed presentation and a high incidence of tubal rupture. Early diagnosis using urine pregnancy testing and ultrasonography, prompt referral, and timely intervention are essential to reduce complications, improve maternal outcomes, and facilitate fertility-preserving management whenever feasible.

Keywords: Ectopic Pregnancy, Tubal Pregnancy, Ultrasonography, Risk Factors, Laparotomy, Maternal Morbidity, Ruptured Ectopic Pregnancy, Methotrexate.

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Introduction

“Ectopic pregnancy,” derived from the Greek word Ektopos, refers to the implantation of a fertilized ovum outside the endometrial cavity of the uterus.[1] Approximately 98% of ectopic pregnancies occur within the fallopian tube, most commonly in the ampullary (79.6%), isthmic (12.3%), and fimbrial (6.2%) regions, while ovarian,

cervical, abdominal, cornual, and caesarean scar pregnancies are relatively uncommon.[2] Tubal implantation is primarily attributed to impaired transport of the developing blastocyst through the fallopian tube. The incidence of ectopic pregnancy varies globally, ranging from 0.3–0.5% of deliveries in developed countries to higher rates in low-

resource settings.[3] In India, reported incidences range from 2.46 to 5.6 per 1,000 deliveries, highlighting its continuing public health significance. [4-6] Over recent decades, the incidence has increased owing to improved diagnostic modalities, greater use of assisted reproductive techniques, and a rising prevalence of PID (Pelvic Inflammatory Disease).[7]

Ectopic pregnancy remains a major gynaecological emergency and an important cause of first-trimester maternal morbidity and mortality, particularly in developing countries where delayed presentation frequently results in tubal rupture and haemodynamic instability.[8] Although maternal mortality has declined, ectopic pregnancy still contributes substantially to pregnancy-related deaths because of delayed diagnosis and severe haemorrhage.[9]

Early diagnosis has been facilitated by transvaginal ultrasonography and quantitative serum β -hCG estimation, enabling conservative medical and fertility-preserving surgical management in selected patients.[10] However, in resource-limited settings, delayed healthcare access, limited diagnostic facilities, and lack of clinical suspicion continue to result in a high proportion of ruptured ectopic pregnancies requiring laparotomy.[11] Risk factors include previous tubal damage, pelvic inflammatory disease, prior ectopic pregnancy, infertility treatment, tubal surgery, sexually transmitted infections, and assisted reproductive technologies.[12] Nevertheless, many women present without identifiable risk factors, and the classical triad of amenorrhoea, abdominal pain, and vaginal bleeding is observed in only about half of cases, making diagnosis challenging.

Aims and Objectives: The aim of the study was to determine the incidence of ectopic pregnancy among the study population and to evaluate its clinical profile. It also aimed to describe the demographic characteristics, clinical presentation, associated risk factors, diagnostic findings, management modalities, and complications in women diagnosed with ectopic pregnancy. Furthermore, the study sought to analyse the maternal morbidity and mortality associated with ectopic pregnancy and assess the outcomes of various management approaches, thereby providing insights into the early diagnosis and effective management of this potentially life-threatening condition.

Materials and Methods

Study Design: The present study was a hospital-based cross-sectional observational study conducted in the Department of Obstetrics and Gynaecology at SCB Medical College and Hospital, Cuttack, over a period of one year from April 2023 to March 2024. The study included 200 women diagnosed with ectopic pregnancy.

Inclusion and Exclusion Criteria: The study included all women presenting with a clinical history suggestive of ectopic pregnancy in whom the diagnosis was confirmed by clinical examination, ultrasonography, and/or direct visualization during laparotomy. Women diagnosed with heterotopic pregnancy were excluded from the study.

Sample Size Calculation: Sample size was calculated by the following formula, where N=population size, Z=z score, e=margin of error, and p=standard of deviation.

Sample Size = 200 (conventional sampling method)

Sample size was calculated as follows:

$$\text{Sample size} = \frac{\frac{z^2 \times p(1-p)}{e^2}}{1 + \left(\frac{z^2 \times p(1-p)}{e^2 N} \right)}$$

N - population size, Z - confidence coefficient, e-margin error, p - standard of deviation.

Statistical Analysis: All the data were collected after informed consent taken from the patient. The collected data were entered into Microsoft Excel and analysed using the SPSS (Statistical Package for the Social Sciences) version 21.0. Quantitative variables were summarized using mean and standard deviation, while continuous variables were expressed as mean $\pm$ standard deviation or median with range, as appropriate. Comparisons of continuous variables were performed using Student's t-test. Categorical variables were presented as frequencies and percentages. A p-value of <0.05 was considered statistically significant, with the power of the study maintained at 80%. It was assumed that the data followed a normal distribution for the purpose of statistical analysis.

Results

Among all cases, most of cases (80%) were 20–30 years old and the largest gravida group was G2 (42.5%), indicating ectopic pregnancy was most common among women in the peak reproductive age (Table-I).

Table 1: Demographic Profile (Age & Gravida)

Variable	Category	Number	Percentage
Age	<20	4	2
	20-30	160	80
	31-35	26	13
	>35	10	5
Gravida	G1	54	27
	G2	85	42.5
	G3	48	24
	G4	9	4.5
	≥G5	4	2

It is observed from table-II that amenorrhoea and abdominal pain were the commonest presenting symptoms in 88% and 87% of cases respectively,

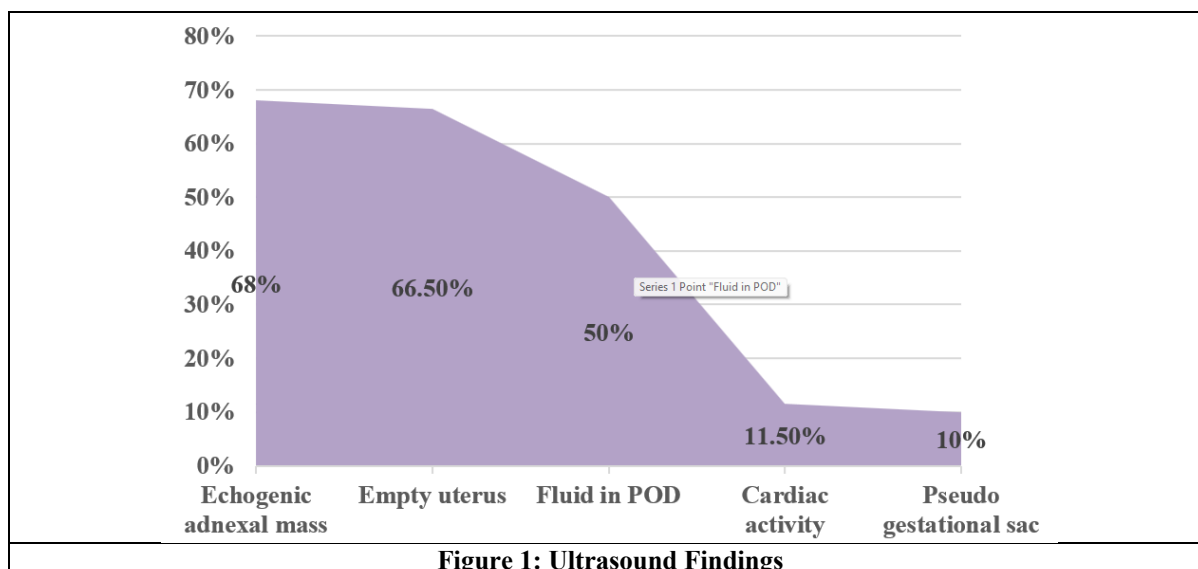
while pallor and abdominal tenderness were the predominant clinical signs in 57% and 55.5% of cases.

Table 2: Clinical Presentation

Feature	Finding	Number	Percentage
Symptoms	Amenorrhea	176	88
	Abdominal pain	174	87
	Vaginal bleeding	116	58
	Vomiting	36	18
	Fever	10	5
	Syncope	8	4
Signs	Pallor	114	57
	Abdominal tenderness	111	55.5
	Tachycardia	78	39
	Hypotension	40	20

Figure-I illustrates that an echogenic adnexal mass and empty uterus were the most frequent

ultrasonographic findings in 68% and 66.5% of cases respectively among the study population.



As seen from table-III observes that previous abdominal/pelvic surgery (31.5%) was the leading

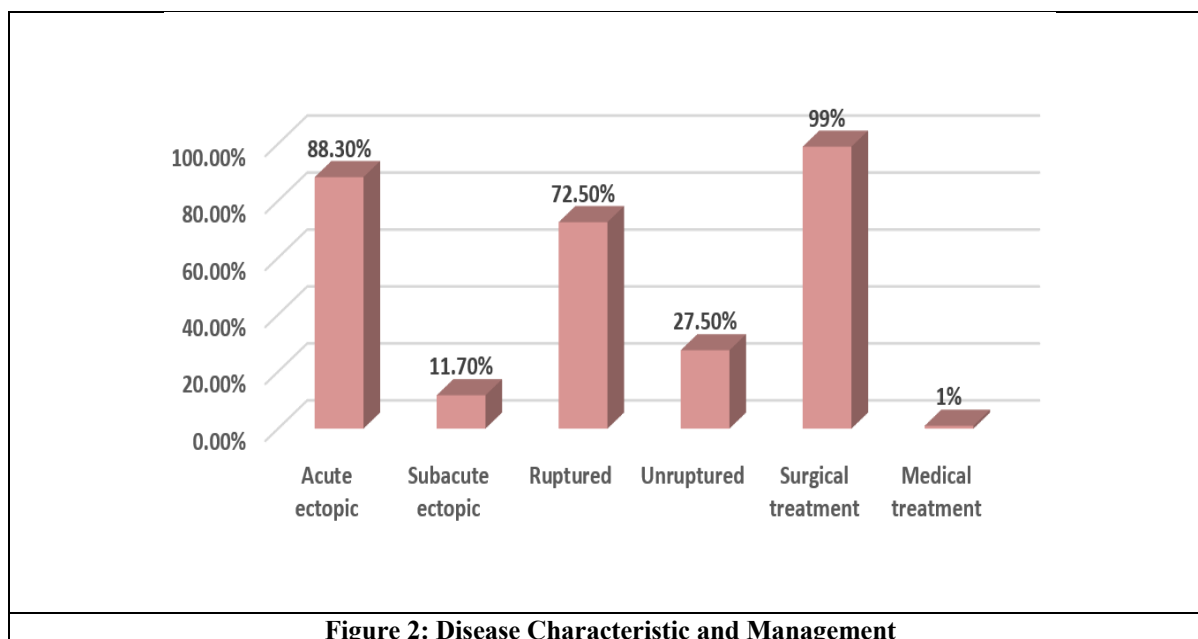
identifiable risk factor followed by genital infection (28.5%) among the cases studied.

Table 3: Risk Factors

Risk Factor	Number	Percentage
Previous abdominal/pelvic surgery	63	31.5
Previous genital infection	56	28.5
Multiple sexual partners	53	26.5
IUCD	45	22.5
PID	40	20
Previous sterilization	31	15.5
Infertility	17	8.5

Figure-II illustrates that most of the cases (88.3%) presented with acute ruptured ectopic pregnancy and

almost all cases (99%) required surgical management.

**Figure 2: Disease Characteristic and Management**

The partial salpingectomy was the commonest procedure in 46.5% of cases and the ampullary

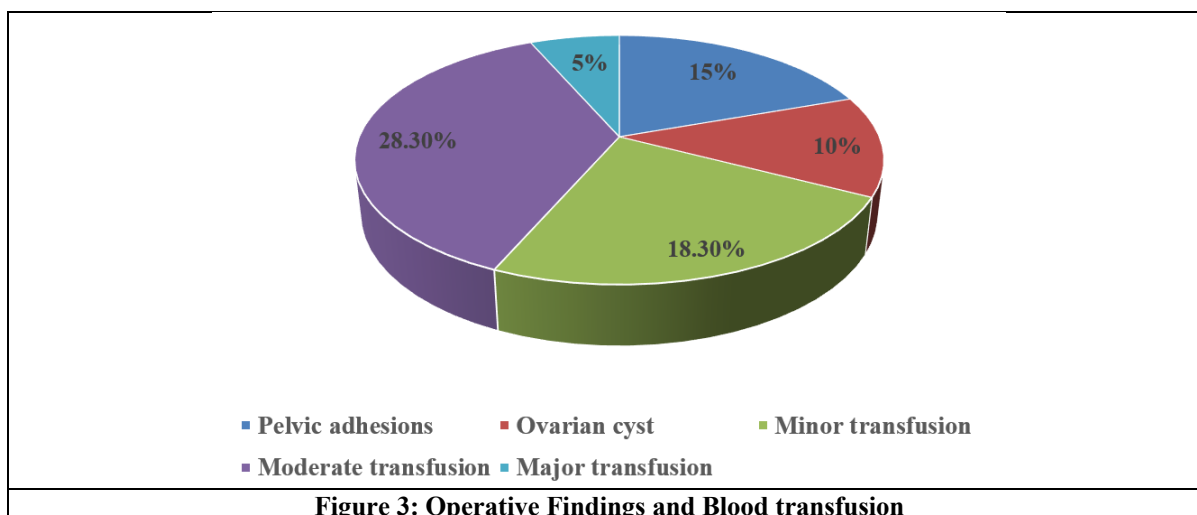
region was the predominant site of ectopic pregnancy in 65% of cases (table-IV).

Table 4: Surgery & Location

Variable	Category	Number	Percentage
Surgery	Partial salpingectomy	93	46.5
	Complete salpingectomy	19	9.5
	Linear salpingotomy	10	5
	Wedge resection	15	7.5
Location	Ampullary	130	65
	Fimbrial	33	16.5
	Cornual	21	10.5

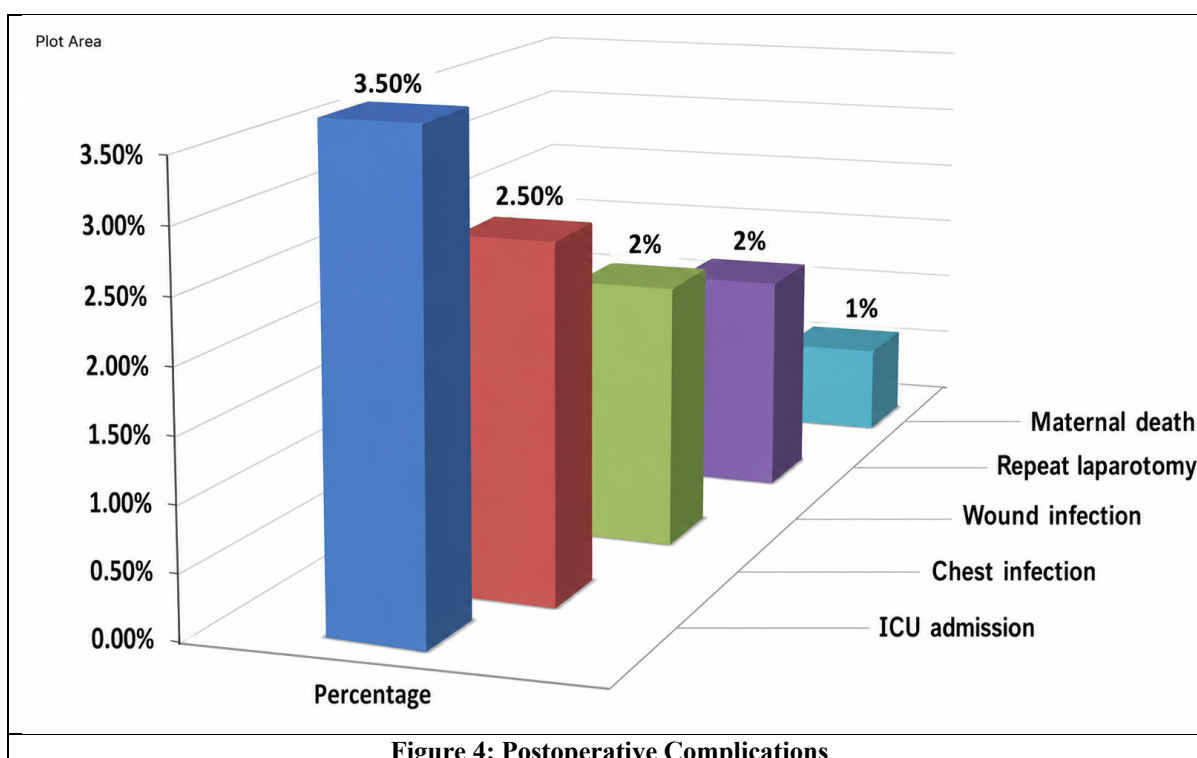
Figure-III illustrates that pelvic adhesions (15%) were the most frequent intraoperative finding, and

moderate blood transfusion (28.3%) was the commonest transfusion category.



As seen from figure-IV, the postoperative complications were infrequent, with ICU admission

being the most common complication in 3.5% of cases.



Discussion

Ectopic pregnancy remains one of the leading causes of maternal morbidity during the first trimester despite significant advances in diagnosis and management. In the present study, amenorrhoea, abdominal pain, and vaginal bleeding constituted the most common presenting symptoms. Tay et al.,[13] reported that abdominal pain and amenorrhoea were the predominant presenting complaints among women with ectopic pregnancy, while Gharoro and Igbafe[14] similarly observed that abdominal pain, amenorrhoea, and irregular vaginal bleeding were the common clinical manifestations. The findings of

the present study are therefore consistent with previous literature, emphasizing that early recognition of these symptoms is essential for timely diagnosis.

In the present study, previous LSCS, tubal surgery, pelvic inflammatory disease, previous ectopic pregnancy, infertility, and previous abortions were the predominant risk factors. Majhi et al.[15] similarly reported tubal pathology and previous pelvic surgery as important determinants of ectopic pregnancy, while Rashmi et al.,[5] also observed pelvic inflammatory disease and infertility to be significant risk factors. These findings reinforce the

role of tubal damage and previous pelvic infections in the pathogenesis of ectopic pregnancy.

The present study also demonstrated that post-sterilisation ectopic pregnancy accounted for 15.5% of cases, with concurrent and puerperal sterilisation being the most common antecedent procedures. Majhi et al.,[15] likewise reported that women conceiving after tubal sterilisation remain at considerable risk of ectopic implantation, particularly several years after the sterilisation procedure. This highlights the need for clinicians to maintain a high index of suspicion for ectopic pregnancy in women presenting with pregnancy following sterilisation.

Urine pregnancy testing showed excellent diagnostic sensitivity, while ultrasonography demonstrating an empty uterine cavity, adnexal mass, and free pelvic fluid was highly suggestive of ectopic pregnancy. Barnhart et al.,[16] have similarly emphasized that the combined use of serum β -hCG estimation and transvaginal ultrasonography significantly improves the early diagnosis of ectopic pregnancy. These findings support the routine use of both biochemical and imaging modalities for prompt diagnosis before tubal rupture occurs. Although medical management with methotrexate was feasible in selected patients, only a small proportion of women in the present study received conservative treatment because many preferred definitive surgical managements. Hajenius et al.,[17] also reported that methotrexate is an effective option for carefully selected haemodynamically stable women with unruptured ectopic pregnancy, whereas delayed presentation frequently necessitates surgical intervention. This reflects the continuing challenge of implementing conservative management in developing countries.

In the present study, laparotomy with salpingectomy remained the most frequently performed surgical procedure because the majority of patients presented with ruptured ectopic pregnancy. Samiya Mufti et al.,[18] similarly reported that open surgery was the preferred treatment modality in all patients owing to delayed presentation. Likewise, Majhi et al.,[15] Rashmi et al.,[5] and Samiya Mufti et al.,[18] observed that ruptured ectopic pregnancy continues to predominate in developing countries because of delayed diagnosis and referral. These findings indicate that improving early diagnosis may increase the feasibility of conservative surgical and medical management.

The present study found that ampullary pregnancy (65%) was the most common site of ectopic implantation. Comparable findings were reported by Rashmi et al.,[5] and Rose et al.,[19] who also identified the ampulla as the predominant site of tubal ectopic pregnancy. This similarity reflects the anatomical predisposition of the ampullary segment

to implantation following delayed ovum transport. During surgery, several associated pelvic pathologies including adhesions, ovarian cysts, corpus luteal cysts, endometriosis, hydrosalpinx, and hematosalpinx were identified. Similar intraoperative findings have been reported by Majhi et al.,[15] suggesting that underlying tubal and pelvic pathology plays an important role in the development of ectopic pregnancy. In the present study, 72.5% of surgically managed patients had ruptured ectopic pregnancies, with many requiring blood transfusions because of significant hemoperitoneum. Samiya Mufti et al.,[18] similarly reported a high incidence of ruptured ectopic pregnancies managed surgically, while Majhi et al.,[15] and Rashmi et al.,[5] also observed that delayed presentation remains the principal reason for tubal rupture in developing countries. These observations emphasize the importance of prompt diagnosis and referral to reduce maternal morbidity.

A considerable proportion of women in the present study required blood transfusion, particularly those with cornual and isthmic ruptured ectopic pregnancies associated with massive hemoperitoneum. Rashmi et al. [5] also observed increased transfusion requirements among women with ruptured ectopic pregnancy. This highlights the need for early surgical intervention before haemodynamic compromise develops.

Importantly, no maternal mortality was recorded in the present study despite the high incidence of ruptured ectopic pregnancy. Rashmi et al.,[5] similarly reported favourable maternal survival following prompt surgical management. This reflects the improvements in emergency obstetric services, timely blood transfusion, and perioperative care that have substantially reduced mortality associated with ectopic pregnancy. The findings of the present study are comparable with those reported by Majhi et al.,[15] Rashmi et al.,[5] Samiya Mufti et al.,[18] and Rose et al.,[19]. The study highlights that early identification of risk factors, prompt diagnosis using urine pregnancy testing and ultrasonography, and timely surgical or medical management are essential to reduce the morbidity associated with ectopic pregnancy.

Limitations

As the study was not randomized, it was not intended to compare treatment outcomes between different management modalities. Therefore, further well-designed randomized controlled trials are recommended to assess and compare the efficacy, safety, and overall benefits of medical versus surgical management of ectopic pregnancy.

Conclusion

Early diagnosis of ectopic pregnancy requires a high index of suspicion, as clinical presentation is often

variable and amenorrhea may be absent. All women of reproductive age presenting with abdominal pain and/or vaginal bleeding should undergo pregnancy testing and ultrasonography, irrespective of menstrual history. Routine first-trimester ultrasound, availability of UPT kits and ultrasound facilities at primary healthcare centres, adequate staff training, and timely referral can significantly reduce maternal morbidity and preserve future fertility. Community awareness regarding early symptom recognition, particularly after sterilization, along with adherence to recommended sterilization techniques, is essential. Establishment of early pregnancy units and integrated surveillance systems may further improve outcomes. Additionally, well-designed randomized controlled trials are needed to compare expectant, medical, and surgical management with long-term evaluation of fertility outcomes, recurrent ectopic pregnancy, quality of life, patient preferences, and cost-effectiveness.

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