

# Clinical Spectrum of Ectopic Pregnancy: A Case Series at a Tertiary Care Centre

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## Abstract

**Background:** Ectopic pregnancy remains a leading cause of first-trimester maternal morbidity and mortality worldwide. Despite advances in imaging and biochemical diagnostics, a significant proportion of cases in low- and middle-income settings continue to present in a ruptured state, necessitating emergency surgical intervention.

**Objectives:** To evaluate the clinical presentation, risk-factor profile, anatomical distribution, and operative outcomes of patients diagnosed with ectopic pregnancy at a tertiary care teaching hospital in southern India.

**Materials and Methods:** A retrospective, observational case series was conducted in the Department of Obstetrics and Gynaecology, Subbaiah Institute of Medical Sciences, Shivamogga, over an 18-month period. Fourteen consecutive women with a confirmed diagnosis of ectopic pregnancy were included. Demographic, clinical, sonographic, and intra-operative data were extracted from case records and analysed using descriptive statistics.

**Results:** The mean age of the study cohort was in the reproductive fourth decade, with the majority (50.00%) aged 31–35 years. Four patients (28.57%) had a history of previous tubectomy. All 14 cases were tubal in location; the right fallopian tube was involved in 8 (57.14%) and the left in 6 (42.86%). The isthmic segment was the most common site of implantation (50.00%), followed by the ampulla (28.57%) and fimbria (21.43%). Most patients (57.14%) presented between 5 and 7 weeks of gestation. Intra-operative blood loss was less than 500 mL in 50.00% and exceeded 1000 mL in 7.14% of cases. All patients underwent emergency laparotomy, and no maternal mortality was recorded.

**Conclusion:** Ectopic pregnancy in this cohort predominantly affected women in the peak reproductive years, with previous tubal sterilisation representing a notable risk factor. The high proportion of ruptured cases despite the availability of tertiary care emphasises the need for improved community awareness, earlier antenatal registration, and prompt evaluation of first-trimester bleeding to reduce morbidity.

**Keywords:** Ectopic pregnancy; Tubal pregnancy; Ruptured ectopic; Laparotomy; Tubectomy failure; Case series.

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## 1. Introduction

Ectopic pregnancy is defined as the implantation of a developing blastocyst outside the endometrial lining of the uterine cavity and represents one of the most important gynaecological emergencies of the first trimester [1]. The condition contributes disproportionately to first-trimester maternal morbidity and mortality, particularly in resource-limited settings where delayed presentation is common.

Globally, ectopic pregnancy complicates approximately 1.3–2.4% of all pregnancies, and Indian data suggest an incidence in the range of 1–2% [2]. Approximately 90% of ectopic gestations implant within the fallopian tube; the remaining cases occur at less common sites including the cervix, ovary,

myometrium (interstitial), caesarean section scar, and other extrauterine locations [3]. Among tubal ectopics, the ampullary segment is classically the most frequently involved, although the distribution varies across published series.

The classical clinical triad of amenorrhoea, abdominal or pelvic pain, and vaginal bleeding is highly variable, and a significant proportion of patients present atypically. Rupture of the ectopic gestation can precipitate haemodynamic collapse and haemorrhagic shock, which continues to account for a substantial share of first-trimester maternal deaths [2]. A high index of clinical suspicion, supported by transvaginal or transabdominal ultrasonography and serial quantitative  $\beta$ -hCG estimation, remains the cornerstone of diagnosis [2].

Management strategies range from expectant observation and medical therapy with methotrexate to conservative or radical surgery, and are influenced by haemodynamic stability, site of implantation,  $\beta$ -hCG levels, ultrasonographic findings, and the woman's desire for future fertility [4]. The core therapeutic goals are the preservation of fertility wherever possible, timely and accurate diagnosis, and appropriate psychological support for the affected woman and her family [4].

Despite the availability of these diagnostic and therapeutic modalities, a disproportionately high number of patients in developing countries continue to present with ruptured ectopic pregnancy [5]. Against this background, the present case series was undertaken to describe the clinical spectrum, risk-factor profile, anatomical distribution, and operative outcomes of patients with ectopic pregnancy managed at a tertiary care teaching hospital in southern Karnataka.

## 2. Objectives

The primary objective of this study was to review the risk factors, anatomical sites, and clinical parameters of patients diagnosed with ectopic pregnancy attending the Department of Obstetrics and Gynaecology at Subbaiah Institute of Medical Sciences, Shivamogga. The secondary objective was to describe the operative findings and immediate outcomes among these patients, with a view to identifying opportunities for improved community awareness and earlier clinical detection.

## 3. Materials and Methods

### 3.1 Study design and setting

This was a hospital-based, retrospective, observational case series conducted in the Department of Obstetrics and Gynaecology at Subbaiah Institute of Medical Sciences, Shivamogga, Karnataka, India — a tertiary care teaching hospital serving a predominantly semi-urban and rural catchment area of the Malnad region.

### 3.2 Study duration and sample size

The study period extended over 18 months. During this interval, 14 consecutive women with a confirmed diagnosis of ectopic pregnancy were admitted to the department and were included in the final analysis.

### 3.3 Inclusion and exclusion criteria

All women presenting to the department with a confirmed diagnosis of ectopic pregnancy — based on clinical evaluation, urine and serum  $\beta$ -human chorionic gonadotrophin ( $\beta$ -hCG), and ultrasonographic findings — were included. Patients with incomplete case records or with a final intra-operative diagnosis other than ectopic pregnancy were excluded.

### 3.4 Data collection

Demographic details, obstetric history, presenting complaints, sterilisation status, ultrasonographic

findings, gestational age at presentation, intra-operative findings (side and anatomical site of ectopic, quantum of haemoperitoneum, estimated blood loss), and immediate post-operative outcome were extracted from case records using a pre-designed proforma.

### 3.5 Statistical analysis

Data were tabulated in Microsoft Excel and analysed using descriptive statistics. Categorical variables were expressed as frequencies and percentages. Given the limited sample size, no inferential statistical testing was performed.

### 3.6 Ethical considerations

The study was conducted in accordance with the principles of the Declaration of Helsinki. As the study was retrospective and involved only de-identified case record data, individual patient consent was not required. Institutional ethics committee approval was obtained prior to data extraction.

## 4. Results

A total of 14 women with a confirmed diagnosis of ectopic pregnancy were included in the analysis. All patients underwent emergency exploratory laparotomy, and no maternal deaths occurred during the study period.

### 4.1 Age distribution

The largest proportion of patients (50.00%) belonged to the 31–35 year age group, followed by the 25–30 year group (28.57%). Only one patient (7.14%) was aged 41–45 years. The distribution is summarised in Table 1 and illustrated in Figure 1.

**Table 1. Age distribution of patients with ectopic pregnancy (N = 14)**

| Age group (years) | Number of patients (n) | Percentage (%) |
|-------------------|------------------------|----------------|
| 25–30             | 4                      | 28.57          |
| 31–35             | 7                      | 50.00          |
| 36–40             | 2                      | 14.29          |
| 41–45             | 1                      | 7.14           |
| <b>Total</b>      | <b>14</b>              | <b>100.00</b>  |

**Figure 1. Age distribution of patients with ectopic pregnancy (N=14)**

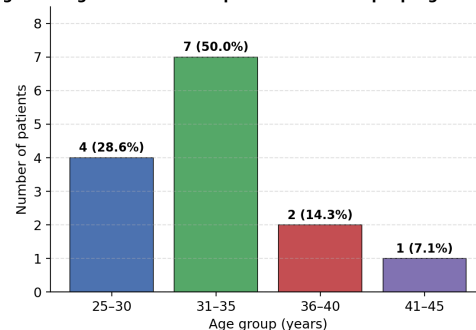


Figure 1. Age distribution of patients with ectopic pregnancy.

#### 4.2 Sterilisation status

Four patients (28.57%) had a history of previous tubectomy performed for permanent contraception, and thus presented with a failed sterilisation ectopic. The remaining 10 patients (71.43%) had not undergone tubal ligation (Table 2, Figure 2).

Table 2. Distribution of patients by tubectomy status (N = 14)

| Sterilisation status    | Number of patients (n) | Percentage (%) |
|-------------------------|------------------------|----------------|
| Previously tubectomised | 4                      | 28.57          |
| Not tubectomised        | 10                     | 71.43          |
| <b>Total</b>            | <b>14</b>              | <b>100.00</b>  |

Figure 2. Distribution of patients by tubectomy status (N=14)

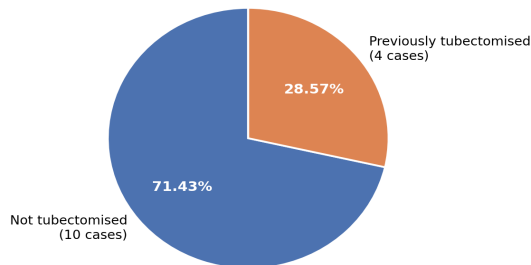


Figure 2. Distribution of patients by tubectomy status.

#### 4.3 Site of ectopic pregnancy — laterality

All 14 ectopic pregnancies were tubal in location. The right fallopian tube was involved in 8 patients (57.14%) and the left fallopian tube in 6 patients (42.86%) (Table 3, Figure 3).

Table 3. Laterality of tubal ectopic pregnancy (N = 14)

| Side involved        | Number of patients (n) | Percentage (%) |
|----------------------|------------------------|----------------|
| Right fallopian tube | 8                      | 57.14          |
| Left fallopian tube  | 6                      | 42.86          |
| <b>Total</b>         | <b>14</b>              | <b>100.00</b>  |

Figure 3. Laterality of tubal ectopic pregnancy (N=14)

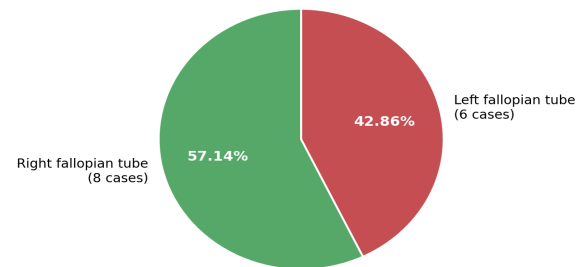


Figure 3. Laterality of tubal ectopic pregnancy.

#### 4.4 Anatomical site within the fallopian tube

The isthmic segment was the commonest site of tubal implantation, accounting for 50.00% of cases, followed by the ampulla in 28.57% and the fimbrial end in 21.43% (Table 4, Figure 4). This distribution differs from the classical pattern in which the ampulla predominates, and is likely explained by the disproportionate contribution of post-tubectomy ectopics in the present cohort.

Table 4. Anatomical distribution of tubal ectopic pregnancies (N = 14)

| Anatomical site | Number of patients (n) | Percentage (%) |
|-----------------|------------------------|----------------|
| Isthmus         | 7                      | 50.00          |
| Ampulla         | 4                      | 28.57          |
| Fimbria         | 3                      | 21.43          |
| <b>Total</b>    | <b>14</b>              | <b>100.00</b>  |

Figure 4. Anatomical distribution of tubal ectopic pregnancies (N=14)

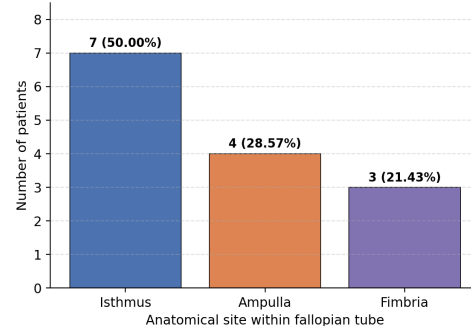


Figure 4. Anatomical distribution of tubal ectopic pregnancies.

#### 4.5 Gestational age at presentation

The majority of patients (57.14%) presented between 5 and 7 completed weeks of gestation, calculated from the last menstrual period. Four patients (28.57%) presented between 7 and 9 weeks, while 2 patients (14.29%) presented beyond 10 weeks (Table 5, Figure 5).

Table 5. Distribution of patients by gestational age at presentation (N = 14)

| Gestational age | Number of patients (n) | Percentage (%) |
|-----------------|------------------------|----------------|
| 5–7 weeks       | 8                      | 57.14          |
| 7–9 weeks       | 4                      | 28.57          |
| > 10 weeks      | 2                      | 14.29          |
| <b>Total</b>    | <b>14</b>              | <b>100.00</b>  |

Figure 5. Distribution of patients by gestational age (N=14)

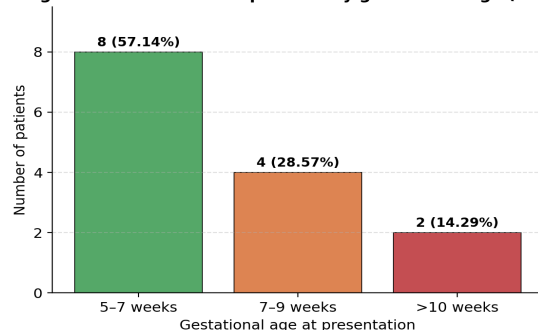


Figure 5. Distribution of patients by gestational age at presentation.

#### 4.6 Intra-operative blood loss

Intra-operative blood loss was less than 500 mL in 7 patients (50.00%) and between 500 and 1000 mL in 6 patients (42.86%). One patient (7.14%) had a blood loss exceeding 1000 mL and required intra-operative blood transfusion (Table 6, Figure 6).

Table 6. Intra-operative blood loss among study patients (N = 14)

| Estimated blood loss | Number of patients (n) | Percentage (%) |
|----------------------|------------------------|----------------|
| < 500 mL             | 7                      | 50.00          |
| 500–1000 mL          | 6                      | 42.86          |
| > 1000 mL            | 1                      | 7.14           |
| <b>Total</b>         | <b>14</b>              | <b>100.00</b>  |

Figure 6. Intra-operative blood loss among study patients (N=14)

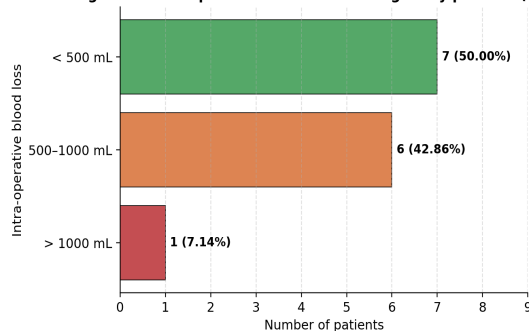


Figure 6. Intra-operative blood loss among study patients.

#### 5. Discussion

Ectopic pregnancy continues to pose a significant challenge for the obstetrician because of its highly variable and often misleading clinical presentation [1]. The classical triad of amenorrhoea, abdominal pain, and vaginal bleeding is present in only a minority of women, and the diagnosis may be missed at the first medical contact. If not diagnosed and managed promptly, the likelihood of rupture increases with advancing gestational age, leading to major haemorrhage, the need for blood transfusion, more extensive surgery, and — in a small but non-trivial proportion of women — maternal death [5].

The predominance of the 31–35 year age group observed in the present series is consistent with the recognised peak of ectopic pregnancy in the fourth decade of life. This age band corresponds to the period of highest cumulative exposure to risk factors such as pelvic inflammatory disease, prior pelvic or tubal surgery, previous ectopic pregnancy, use of intrauterine contraceptive devices, assisted reproductive treatment, and tubal sterilisation.

A striking observation in the present cohort was the high proportion (28.57%) of patients who had previously undergone tubectomy. Post-sterilisation ectopic pregnancy is a well-recognised entity: although tubal ligation is a highly effective contraceptive method, when pregnancy does occur after sterilisation, the relative risk of that pregnancy being ectopic is disproportionately increased. This is likely to explain the unusual anatomical distribution seen in the present series, in which the isthmus — rather than the ampulla — was the most frequently involved segment. Isthmic ectopics are known to rupture earlier and at smaller gestational sizes because of the narrow lumen and thinner muscular wall of this segment, and post-sterilisation ectopics are characteristically isthmic.

Approximately 90% of all ectopic pregnancies are tubal, and in the present cohort every case was tubal in location [3]. Non-tubal sites such as the ovary, cervix, interstitial segment, caesarean scar and abdominal cavity are increasingly recognised in modern practice and merit specific diagnostic consideration, but were not encountered in this small series. A modest right-sided preponderance (57.14% versus 42.86%) was observed. The right-sided predominance of ectopic pregnancy has been reported in several previous series and is variably attributed to anatomical factors, differential susceptibility to appendicitis-related pelvic inflammation, and referral patterns.

Tubal pregnancy tends to become clinically symptomatic in the first trimester because the fallopian tube lacks a well-developed submucosal layer; implantation occurs directly on the muscular layer, and the proliferating trophoblast rapidly erodes the muscle wall [5]. This process typically culminates in tubal

rupture at a mean gestational age of approximately  $7.2 \pm 2.2$  weeks [2]. The clustering of our patients in the 5–7 week window (57.14%) is fully consistent with this natural history and underscores the narrow diagnostic window available for pre-rupture intervention.

The finding that approximately half of the patients had an intra-operative blood loss of less than 500 mL, while more than 40% had a blood loss between 500 and 1000 mL and one patient exceeded 1000 mL, reflects the fact that most patients in this series were operated upon after rupture had already occurred. This is a recurrent observation in Indian tertiary care case series, and is at variance with practice in higher-resource settings, where a substantially larger proportion of ectopic pregnancies are diagnosed prior to rupture and are amenable to medical management with methotrexate or to laparoscopic salpingostomy [4].

The choice of surgical procedure — salpingectomy versus salpingostomy — is guided by the woman's haemodynamic status, the extent of tubal damage, the condition of the contralateral tube, and her future fertility wishes [4]. Emergency laparotomy with salpingectomy remains the procedure of choice in haemodynamically compromised patients and in those with a grossly ruptured tube, as was true for the patients in the present series. Where laparoscopic expertise, operating theatre availability, and haemodynamic stability permit, laparoscopic management offers well-documented advantages in terms of blood loss, hospital stay, and post-operative recovery.

### 5.1 Limitations

The present study is limited by its retrospective design, single-centre setting, and small sample size, which preclude formal inferential analysis and limit the external generalisability of the findings. The cohort represents only those women who reached the tertiary care facility, and therefore is likely to under-represent both women who were diagnosed and managed medically at lower levels of the health system and those who succumbed prior to reaching hospital. Prospective, multi-centre studies with larger sample sizes and standardised data capture are needed to more accurately quantify the burden and clinical profile of ectopic pregnancy in this population.

### 6. Conclusion

The findings of this case series demonstrate that, despite access to tertiary care facilities, the majority of ectopic pregnancies in this setting continue to be diagnosed only after rupture, requiring emergency laparotomy. The high proportion of post-tubectomy ectopics and the predominantly isthmic distribution highlight the importance of counselling women about the small but real risk of ectopic pregnancy following

tubal sterilisation, and of maintaining a high index of clinical suspicion in any post-tubectomy woman presenting with amenorrhoea and pain.

Early presentation with symptoms such as secondary amenorrhoea, abnormal bleeding, or lower abdominal pain provides a critical window for timely diagnosis before rupture and before serious complications occur. Sustained public health education, improved access to first-trimester ultrasonography and quantitative  $\beta$ -hCG estimation at primary and secondary care levels, and prompt referral pathways are therefore essential in order to reduce the morbidity associated with ectopic pregnancy in resource-limited settings.

### Declarations

**Funding:** This study received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

**Conflict of interest:** The authors declare that they have no competing interests.

**Ethical approval:** The study was approved by the Institutional Ethics Committee of Subbaiah Institute of Medical Sciences, Shivamogga.

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