ORIGINAL ARTICLE

Analysis of ectopic pregnancies requiring life-saving urgent surgery

Fahri Burçin Fıratlıgil,[1] Serap Topkara Sucu,[2] Yaprak Engin Üstün[3]

[1]Division of Perinatology, Department of Obstetrics and Gynecology, Ankara Bilkent City Hospital, Ankara-*Türkiye*
[2]Department of Obstetrics and Gynecology, Ankara Etlik City Hospital, Ankara-*Türkiye*
[3]Department of Obstetrics and Gynecology, Ankara Etlik Zubeyde Hanim Women's Health Traning and Research Hospital, Ankara-*Türkiye*

ABSTRACT

BACKGROUND: This study aims to analyze the demographic, ultrasonographic, and laboratory findings as well as the outcomes of patients with ectopic pregnancy (EP) who underwent life-saving urgent surgery.

METHODS: A retrospective cross-sectional study was conducted at the Tersiyer Referral Hospital between January 01, 2016 and January 01, 2020. The study included 469 cases of EP. Data for these patients were extracted from hospital records and patient files. For the analysis of life-saving urgent surgeries, only patients presenting with severe signs and symptoms during hospital admission, follow-up, or after methotrexate (MTX) therapy were included.

RESULTS: The mean age of the patients was 31.2 (±5.65) years, with the youngest being 15 years old and the oldest 49 years old. A history of EP was noted in 15.1% of patients, and 29.4% were smokers. The reasons for consulting a doctor included no complaints in 37 patients (7.9%), delayed menstruation in 37 patients (7.9%), abdominal pain in 128 patients (27.3%), abdominal pain with vaginal bleeding in 108 patients (23.0%), and only vaginal bleeding in 159 patients (33.9%). In four patients (0.9%), the ectopic focus could not be identified via ultrasound, while in 255 patients (54.3%) the ectopic focus was located in the right adnexal area. The mean preoperative hemoglobin level was 12.4 (±1.33) g/dL, with a median hemoglobin value of 12.6 (range: 7.2-14.7) g/dL. A comparison of demographic data, ultrasound findings, and pre- and postoperative laboratory results between patients who underwent surgery without MTX therapy and those who underwent surgery following MTX therapy revealed significant differences in terms of age, parity, maximum diameter of the ectopic focus, preoperative hemoglobin levels, preoperative white blood cell counts, presence of free fluid in the abdomen, and contraceptive methods.

CONCLUSION: EP holds a significant place among gynecological emergencies. Any delay in diagnosis can lead to life-threatening conditions, where the only viable treatment at this stage is life-saving urgent surgical intervention.

Keywords: Ectopic pregnancy; life-saving urgent surgery; gynecological emergency; rupture.

INTRODUCTION

An ectopic pregnancy (EP) is the implantation of the products of fertilization outside the uterine cavity and occurs in approximately 1-2% of women of childbearing age.[1] The classic locations for EPs include the ampullary, fimbrial, interstitial, isthmic regions, and the scar line in women who have undergone a cesarean section.[2] Less commonly, EPs are found in the abdominal cavity, cervix, and ovaries.[3] Fallopian tube EPs are among the most commonly diagnosed types of EPs in outpatient clinics, accounting for approximately 94% of Eps.[4] Ectopic pregnancies are among the most critical gynecological emergencies in early pregnancy and can sometimes lead to life-threatening situations.[5] Therefore, patients with EP should

Cite this article as: Fıratlıgil FB, Topkara Sucu S, Engin Üstün Y. Analysis of ectopic pregnancies requiring life-saving urgent surgery. Ulus Travma Acil Cerrahi Derg 2025;31:125-132.

Address for correspondence: Fahri Burçin Fıratlıgil
Division of Perinatology, Department of Obstetrics and Gynecology, Ankara Bilkent City Hospital, Ankara, Türkiye
E-mail: md.fahri@gmail.com

Ulus Travma Acil Cerrahi Derg 2025;31(2):125-132 DOI: 10.14744/tjtes.2024.86087
Submitted: 12.10.2024 Revised: 25.11.2024 Accepted: 18.12.2024 Published: 06.02.2025

have timely access to comprehensive diagnostic and treatment options. Undiagnosed or untreated EP is life-threatening due to the risk of rupture; delays or failure in treatment can result in fatal outcomes.

The clinical signs and symptoms of EP range from subclinical conditions, where treatment options such as observation or methotrexate (MTX) therapy are suitable, to severe, life-threatening clinical presentations requiring emergency surgical intervention.[6] The signs and symptoms of EP are often non-specific (e.g., abdominal pain, vaginal bleeding, delayed menstruation, nausea, etc.), making the diagnosis of EP challenging.[7] In addition to medical history and examination results, a positive blood test for human chorionic gonadotropin, beta subunit (β-HCG), is essential for diagnosing EP. A negative β-HCG blood test excludes the diagnosis of both ectopic and intrauterine pregnancies. If the β-HCG blood test is positive but there is no doubling of its value within 48 hours,[1,8] transvaginal ultrasound is the preferred diagnostic method in modern clinical practice.[1,9]

Almost all EPs are considered nonviable and carry the risk of rupture and subsequent bleeding. The immediate risks of morbidity and mortality associated with EP rupture can be minimized by diagnosing the condition before rupture or through life-saving urgent surgical intervention after rupture. Identifying potential risk factors, parameters for reliable diagnosis, and assessing the probability of rupture are crucial for effective management.[10] The absence of clear, predefined diagnostic criteria for EP poses significant challenges for both patients and physicians in the early identification of ruptured EP.[10]

This study aims to analyze the demographic, ultrasonographic, and laboratory findings, as well as the outcomes of patients with EP undergoing life-saving urgent surgery.

MATERIALS AND METHODS

This retrospective cross-sectional study was conducted at the Gynecology and Perinatology Departments of Etlik Zübeyde Hanım Gynecology and Pediatrics Training and Research Hospital between January 01, 2016 and January 01, 2020. The study was approved by Etlik Zübeyde Hanım Gynecology and Pediatrics Training and Research Hospital Ethics Committee for Scientific Research (Approval Number: 2024/05, Date: 23.05.2024) and was conducted in accordance with the principles of the Helsinki Declaration.

Inclusion and Exclusion Criteria

Screening for EP was based on the consensus of the American College of Obstetricians and Gynecologist.[1]

Patients with EP who underwent surgery or who underwent surgery following MTX therapy were included in the study. The diagnosis of EP was made using serial beta subunit human chorionic gonadotropin (β-HCG) measurements, serial transvaginal ultrasound examinations, and endometrial sampling to confirm the absence of intrauterine chorionic villi (to rule out early pregnancy loss).

Patients were excluded from the study if they had any of the following risk factors or conditions: maternal chronic diseases (particularly those constituting an absolute contraindication to MTX therapy), a history of subfertility or infertility, pregnancy conceived through assisted reproductive technology, the presence of chorionic villi at endometrial sampling, or incomplete/missing data.

Data

The study included 469 cases of EP. Data for these patients were retrieved from hospital records and patient files. The collected information included patient age, pregnancy status, body mass index (BMI), history of EP, education level, smoking status, history of pelvic inflammatory disease (PID), history of abdominal surgery (including cesarean section), use of contraceptive methods, presenting complaints upon hospital admission, ultrasound findings, results of laboratory tests (preoperative and postoperative), and delta hemoglobin (ΔHB). The ΔHB was calculated using the formula: [preoperative HB] - [postoperative HB].

Evaluation of the Patients

Laboratory analyses, including complete blood count (CBC) and β-HCG levels, were conducted for patients admitted with various complaints using the Advia® 120 hematology system (Siemens Healthcare Diagnostics Inc., Deerfield, Illinois) and the Advia® 2400 clinical chemistry system (Siemens, Tarrytown, NY, USA). Abdominal and transvaginal ultrasound examinations were performed using the General Electric Voluson S10® system (1.5-4.5 MHz probe, Waukesha, WI, USA). Patients diagnosed with EP were treated according to the appropriate protocols.

Management

This study was conducted in a large tertiary reference center where all treatment protocols of EP, including expectant management, MTX therapy, and surgical interventions, were available.

The MTX treatment protocol typically involves a single intramuscular injection (50 mg/m2). In this protocol, β-hCG levels are measured on days 0, 4, and 7 after MTX administration to assess treatment success. A decrease of 15% or more in β-hCG levels between days 4 and 7 indicates successful treatment. If this reduction is not observed, the medical treatment is repeated with a second dose of MTX (50 mg/m^2).

Patients presenting with severe symptoms or signs indicative of surgical intervention (e.g., acute abdomen, intra-abdominal hemorrhage exceeding 100 mL, shock, etc.) were treated urgently with surgery. Life-saving urgent surgery was also

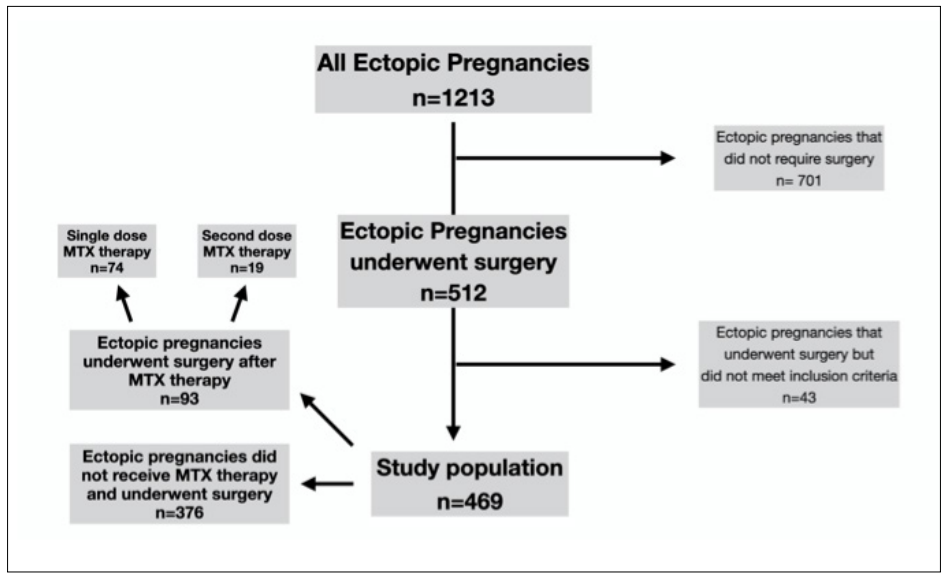

Figure 1. Flowchart of the patients.

performed in patients exhibiting severe symptoms or signs after receiving the first and/or second dose of MTX. Surgical treatment options included salpingostomy, salpingectomy, and tubal or fimbrial milking. Among these, salpingectomy and salpingostomy were most frequently performed in our hospital.

For the analysis of life-saving urgent surgeries, only patients presenting with the aforementioned severe signs and symptoms during hospital admission, follow-up, or after MTX therapy were included.

Study Design

A total of 469 patients diagnosed with EP in our hospital, meeting the inclusion criteria described in the "Materials and Methods" section, and who underwent life-saving urgent surgery were included in the study. After evaluating these patients, they were divided into two groups:

• Group I: Patients who underwent surgery without MTX therapy.

• Group II: Patients who underwent surgery following MTX therapy.

The preoperative and postoperative outcomes of these two groups were then analyzed and compared.

Statistical Analyses

Data analyses were performed using Jamovi (Jamovi, Version 2.5, Sydney, Australia), an open-source statistical software for desktop and cloud platforms. Results from the cross-sectional analysis of the dataset are presented as mean ± standard deviation (SD) and median (minimum-maximum and/or Q1-Q3) for numerical data, and as frequency and percentage for categorical variables. A p-value of less than 0.05 was considered statistically significant.

The distribution of variables was analyzed using both analytical methods (Kolmogorov-Smirnov/Shapiro-Wilk tests) and visual methods (probability plots and histogram) to determine whether they followed a normal distribution. Homogeneity of variance was tested with the Levene test. For comparisons of normally distributed variables, the independent samples t-test was used. For numerical data that were not normally distributed, the Mann-Whitney U test was employed. Relationships between categorical variables were analyzed using the chi-square test, or Fisher's exact test when the chi-square test assumptions were not met due to low expected cell counts.

RESULTS

A total of 512 patients underwent surgery for EP. After applying the exclusion criteria, 469 patients were included in the final analysis. Of these, 93 patients underwent surgery following MTX treatment, while the remaining patients underwent surgery either at admission or during follow-up (Fig. 1).

The demographic analysis of the patients is summarized in Table 1. The mean age of the patients was 31.2 (±5.65) years, with the youngest patient being 15 years old and the oldest 49 years old. A history of EP was noted in 15.1% of patients, and 29.4% of patients were smokers. Reasons for consulting a doctor included no complaints in 37 patients (7.9%), delayed menstruation in 37 patients (7.9%), abdominal pain in 128 patients (27.3%), abdominal pain with vaginal bleeding in 108 patients (23.0%), and only vaginal bleeding in 159 patients (33.9%).

Table 1. Demographic characteristics of the patients

Age (years)	
Mean ± SD	31.2 (±5.65)
Median (min-max)	31 (15-49)
BMI (kg/m2)	
Mean ± SD	25.2 (±4.55)
Median (min-max)	25 (14-44)
Gravidity	
Mean ± SD	3.2 (±1.67)
Median (min-max)	3 (1-11)
Parity	
Mean ± SD	1.4 (±1.18)
Median (min-max)	1 (0-6)
Miscarriage	
Mean ± SD	0.4 (±0.88)
Median (min-max)	0 (0-8)
History of EP, n (%)	71 (15.1)
History of Stillbirth, n (%)	18 (3.8)
History of SVD, n (%)	230 (49)
History of CS, n (%)	127 (27.1)
Education Level	
Illiterate, n (%)	27 (5.8)
Primary/Secondary School, n (%)	202 (43.1)
High School/University, n (%)	240 (51.1)
Working Status (yes)	113 (24.1)
Smoking (yes)	138 (29.4)
PID (yes)	6 (1.3)
Previous Abdominal Surgery (with CS) (yes)	167 (35.6)
Contraceptive Use (yes)	
BTL, n (%)	4 (0.9)
IUD, n (%)	54 (11.5)
Other (condom, CI), n (%)	43 (9.2)
Complaints	
None, n (%)	37 (7.9)
Menstrual Delay, n (%)	37 (7.9)
Pain, n (%)	128 (27.3)
Pain + Bleeding, n (%)	108 (23.0)
Bleeding, n (%)	159 (33.9)

BMI: Body Mass Index; BTL: Bilateral Tubal Ligation; CI: Coitus Interruptus; CS: Cesarean Section; EP: Ectopic Pregnancy; IUD: Intrauterine Device; n: Number; PID: Pelvic Inflammatory Disease; SD: Standard Deviation; SVD: Spontaneous Vaginal Delivery. Data are presented as mean ± SD, median and quartiles (min - max), or number (percentage).

Table 2. Ultrasound findings and pre- and postoperative laboratory results of the patients

Laterality	
Right-sided, n (%)	4 (0.9)
Left-sided, n (%)	210 (44.8)
Unknown location, n (%)	255 (54.3)
Intra-abdominal bleeding (yes), n (%)	249 (53.1)
Maximum diameter of ectopic focus (mm)	
Mean ± SD	25.5 (±14.64)
Median (min - max)	22 (0-91)
Diameter of ectopic focus (Mean ± SD)	
≥35 mm	92 (±19.6)
<35 mm	377 (±80.4)
Embryonic cardiac activity (yes), n (%)	52 (11.1)
Preoperative HB	
Mean ± SD	12.4 (±1.33)
Median (min - max)	12.6 (7-16.6)
Preoperative WBC	
Mean ± SD	8803 (±2874.3)
Median (min - max)	8370 (1110-27410)
Preoperative PLT	
Mean ± SD	275000 (±94568)
Median (min - max)	264000 (71000-1550000)
Postoperative HB	
Mean ± SD	10.9 (±1.26)
Median (min - max)	11.1 (7.2-14.7)
Postoperative WBC	
Mean ± SD	9287 (±3370)
Median (min - max)	8560 (1088-25240)
Postoperative PLT	
Mean ± SD	240205 (±63703)
Median (min - max)	234000 (61000-561000)
Delta HB	
Mean ± SD	1.5 (±1.03)
percentage difference	11.8% (±8.6%)
Median (min - max)	1.5 (0-6.9)
percentage difference	11.7% (0-48.9)
MTX therapy (yes)	93 (19.8)
Second dose MTX (yes)	19 (20.4)

HB: Hemoglobin; PLT: Platelet; MTX: Methotrexate; n: Number; SD: Standard Deviation; WBC: White Blood Cell. Data are presented as mean ± SD, median and quartiles (min-max), or number (percentage).

The analysis of ultrasound findings and pre- and postoperative laboratory results is presented in Table 2. In four patients (0.9%), the ectopic focus could not be identified via ultrasound, while in 255 patients (54.3%), the ectopic focus was located in the right adnexal area. The mean preoperative HB level was 12.4 (±1.33) g/dL, and the median HB value was 12.6 g/dL (range: 7.2-14.7 g/dL).

The comparison of demographic data, ultrasound findings,

Table 3. Comparison of demographic data between patients who underwent surgery without methotrexate (MTX) therapy and those who underwent surgery after MTX therapy

	MTX No (n=376)	MTX Yes (n=93)	p
Age (years) Median (Q1 - Q3)	32 (27-36)	29 (26-33)	**0.006**
BMI (kg/m2) Median (Q1 - Q3)	25 (22-28)	25 (22-27)	0.452
Gravidity Median (Q1 - Q3)	3 (2-4)	3 (2-4)	0.054
Min - Max	1-11	1-8	
Mean ± SD	3.2 (±1.70)	2.8 (±1.50)	
Parity Median (Q1 - Q3)	1 (0-2)	1 (0-2)	
Min - Max	0-6	0-3	
Mean ± SD	1.4 (±1.22)	1.1 (±0.92)	**0.017**
Miscarriage Median (Q1 - Q3)	0 (0-1)	0 (0-1)	
Min - Max	0-8	0-3	
Mean ± SD	0.5 (±0.77)	0.193	
History of EP, n (%)	59 (15.7%)	12 (12.9%)	0.610
History of CS Median (Q1 - Q3)	0 (0-1)	0 (0-1)	0.146
Education			
Illiterate, n (%)	23 (6.1)	4 (4.3)	0.222
Primary/Secondary school, n (%)	168 (44.7)	34 (36.6)	
High school/University, n (%)	185 (49.2)	55 (59.1)	
Working status (yes), n (%)	92 (24.5)	21 (22.6)	0.806
Smoking (yes), n (%)	114 (30.3)	24 (25.8)	0.467
PID (yes), n (%)	6 (1.6)	0 (0)	0.604
Previous abdominal surgery (with CS) (yes), n (%)	133 (35.4)	34 (36.6)	0.926
Contraception (yes)			**<0.001**
BTL, n (%)	4 (1.1)	0 (0)	NA
IUD, n (%)	51 (13.6)	3 (3.2)	**0.009**
Condom, n (%)	5 (3.3)	3 (3.2)	0.198
CI, n (%)	35 (9.3)	0 (0)	**0.005**
Complaints			
None, n (%)	27 (7.2)	10 (10.8)	
Menstrual delay, n (%)	28 (7.4)	9 (9.7)	
Pain, n (%)	111 (29.5)	17 (18.3)	0.238
Pain + bleeding, n (%)	85 (22.6)	23 (24.7)	
Bleeding, n (%)	125 (33.2)	34 (36.6)	

BMI: Body Mass Index; BTL: Bilateral Tubal Ligation; CI: Coitus Interruptus; CS: Cesarean Section; EP: Ectopic Pregnancy; IUD: Intrauterine Device; n: Number; PID: Pelvic Inflammatory Disease; SD: Standard Deviation; SVD: Spontaneous Vaginal Delivery. Data are presented as mean ± SD, median and quartiles (min - max), or number (percentage). A p-value of <0.05 indicates statistical significance. Statistically significant p-values are in bold.

and pre- and postoperative laboratory results between patients who underwent surgery without MTX therapy and those who underwent surgery following MTX therapy is shown in Tables 3 and 4. Significant differences were observed between the groups in terms of age, parity, maximum diameter of the ectopic focus, preoperative HB level, preoperative white blood cell count, presence of free fluid in the abdomen, and contraceptive methods (p=0.006, p=0.017, p=0.001, p=0.043, p=0.034, p=0.008, and p<0.001, respectively).

The incidence of non-tubal EPs in this study was five cases (1.06%), which included two ovarian pregnancies, one heterotopic pregnancy, one cornual pregnancy, and one abdominal pregnancy.

Table 4. Comparison of ultrasound findings and pre- and postoperative laboratory results between patients who underwent surgery without methotrexate (MTX) therapy and those who underwent surgery after MTX therapy

	MTX No (n=376)	MTX Yes (n=93)	p
Laterality			
Right-sided, n (%)	3 (0.8)	1 (1.1)	0.810
Left-sided, n (%)	171 (45.5)	39 (41.9)	
Unknown location, n (%)	202 (53.7)	53 (57.0)	
Intra-abdominal bleeding (yes), n (%)	211 (56.1)	38 (40.9)	**0.008**
Maximum diameter of ectopic focus (mm)			
Median (Q1 - Q3)	23 (17-32)	19 (14-25)	**0.001**
Embryonic cardiac activity (yes), n (%)	43 (11.4)	9 (9.7)	0.765
Preoperative HB			
Median (Q1 - Q3)	12.5 (11.5-13.3)	12.7 (12.1-13.5)	**0.043**
Preoperative WBC			
Median (Q1 - Q3)	8440 (6955-10325)	8130 (6495-9645)	**0.034**
Preoperative PLT			
Median (Q1 - Q3)	266500 (228250-309000)	256000 (216500-301000)	0.178
Postoperative HB			
Median (Q1 - Q3)	11.1 (10.1-11.7)	11.2 (10.1-11.8)	0.774
Postoperative WBC			
Median (Q1 - Q3)	8675 (7043-11213)	8140 (6480-10625)	0.073
Postoperative PLT			
Median (Q1 - Q3)	235000 (199000-272000)	227000 (193500-269000)	0.272
Delta HB			
Median (Q1 - Q3) percentage difference	1.4 (0.9-2.0)	1.8 (1.0-2.5)	**0.015**
	11.6 (7.4-15.2)	14.6 (7.8-18.6)	**0.026**

Abbreviations: HB: Hemoglobin; PLT: Platelet; MTX: Methotrexate; n: Number; WBC: White Blood Cell. Data are presented as median and quartiles (Q1-Q3) or number (percentage). A p-value of <0.05 indicates a significant difference. Statistically significant p-values are in bold.

DISCUSSION

Classically, there are three options for the treatment of EPs, depending on the patient's symptoms. If the patient's general condition is stable, the ectopic focus measures less than 35 mm in diameter, the β-hCG level is typically below 5000 IU/L, and there is no fetal heartbeat, treatment options such as expectant management and MTX therapy can be considered. Additionally, life-saving urgent surgery is indicated if there is a contraindication to medical treatment options or if the patient's condition deteriorates to a life-threatening level. This study provides an analysis of patients with EP who underwent life-saving urgent surgical treatment in a tertiary referral center hospital.

Without an accurate diagnosis and timely treatment, EP can become a life-threatening condition due to rupture and intra-abdominal bleeding. During the four-year period of this study, 1,213 EP cases were diagnosed in our hospital, of which 512 patients underwent surgery. A total of 469 patients met the inclusion criteria for this study, resulting in a surgical intervention rate of 42.2%. In a study by Nguyen et al.[11] on the surgical outcomes of EP, 76.6% of patients with EP underwent surgery. They also found that 10 patients who failed MTX therapy required surgery (6.8%).[11] In contrast, our study identified 93 patients who failed MTX therapy and subsequently underwent life-saving emergency surgery (7.6% of all EP cases).

The mean age of patients in our study was 31.2 (±5.65) years, with the youngest patient being 15 years old and the oldest 49 years old. Nguyen et al.[11] reported a mean patient age of 30.28 (±5.4) years. Similarly, another study reviewing EP cases reported a mean age of 29.67 (±6.06) years.[12]

The primary risk factor for EP is a history of EP.[1] The likelihood of a recurrent EP is approximately 10% for individuals with a history of one EP (odds ratio: 3.0; 95% confidence

interval [CI]: 2.1-44).[1] Other significant risk factors for EP include cigarette smoking, PID, pre-damaged fallopian tubes, and pregnancies achieved through assisted reproductive technology.[1,13,14] Gaskins et al.[15] investigated risk factors in 411 patients with EP and reported a 1.73-fold increase in EP incidence among smokers. In contrast to previous studies, the present study found that 15.1% of patients (n=71) had a history of EP, 29.4% (n=138) were smokers, and 70.6% were non-smokers. Additionally, only six patients (1.3%) had a history of PID. Women who have undergone tubal ligation or sterilization, or who use an intrauterine device (IUD), have a lower risk of becoming pregnant. However, if these women do become pregnant, up to 53% of such pregnancies are ectopic.[1,16] In our study, 368 patients (78.4%) did not use any contraceptive method. It was also found that four patients had undergone tubal ligation, and 54 patients used an IUD.

In the study by Barik et al.,[17] the common complaints and findings in patients with EP included abdominal tenderness, abdominal distention, pallor, signs of shock (10%), vaginal bleeding, and tenderness during cervical movement. In our study, the most common presenting complaint in 159 patients (33.9%) was vaginal bleeding alone. Many studies have reported that EPs are more frequently localized to the right side and that ruptures are more likely to occur on this side.[17-19] Barik et al.[17] concluded that right-sided EPs accounted for 52.9% of cases, making it the most common direction of laterality, and ruptures occurred in 70% of these cases. Ranji et al.[18] reported that 61.7% of EPs were right-sided. Similarly, our results confirm that EPs are frequently right-sided (54.3%), consistent with findings from other studies.

At our hospital, 42.2% of the 1,213 cases diagnosed with EP over the five-year study period underwent surgery for ruptured EP. This is lower than the 82.50% incidence of ruptured EP reported by Yadav et al.[20] In the patients included in our study, the rate of ruptured EP was 38.6%. Of the 469 patients analyzed, 93 experienced rupture after MTX therapy and required surgery. Among these, 19 patients experienced rupture after the second dose of MTX and subsequently underwent surgery. In this study, approximate HB loss was calculated using ΔHB. For patients undergoing life-saving urgent surgery, the mean ΔHB level was 1.5 (±1.03) g/dL, and the mean percentage loss was 11.8% (±8.6). The median ΔHB value was 1.5 g/dL (range: 0-6.9 g/dL), and the median percentage loss was 11.7% (range: 0-48.9%).

We treated 20 patients with laparotomy and 449 patients with laparoscopic surgery. The surgical techniques performed included the following: two patients underwent salpingostomy, one patient underwent cornual resection, one patient underwent abdominal excision, two patients underwent ovarian wedge resection, and the remainder underwent salpingectomy.

CONCLUSION

EP is a critical condition among gynecological emergencies. Any delay in diagnosis can result in life-threatening complications, with life-saving urgent surgical intervention being the only treatment option at this stage.

Recommendations for Preventive Healthcare

Delays in the diagnosis of EP can lead to life-threatening conditions due to rupture of the ectopic focus and subsequent bleeding. Moreover, these delays can negatively affect individuals with future fertility expectations. Therefore, during prenatal counseling for families planning a pregnancy, educating expectant mothers about EP should be prioritized as a key component of preventive health services.

Strengths and Limitations

The study was conducted in a tertiary referral hospital, where standardized protocols and treatment methods were applied to all patients. The treatment and care of all patients were coordinated by the gynecology and perinatology departments.

However, the retrospective design of the study led to some missing data (e.g., length of hospital stay, whether a blood transfusion was administered, β-HCG results, etc.). Additionally, as the study was conducted at a single center, there was limited exposure to alternative surgical techniques and approaches.

Ethics Committee Approval: This study was approved by the Etlik Zübeyde Hanım Gynecology and Pediatrics Training and Research Hospital Ethics Committee (Date: 23.05.2024, Decision No: 2024/05).

Peer-review: Externally peer-reviewed.

Authorship Contributions: Concept: F.B.F.; Design: F.B.F.; Supervision: Y.E.Ü.; Resource: F.B.F., S.T.S.; Materials: S.T.S.; Data Collection and/or Processing: S.T.S.; Analysis and/or Interpretation - F.B.F., S.T.S.; Literature Review: F.B.F.; Writing: F.B.F.; Critical Review: Y.E.Ü.

Conflict of Interest: None declared.

Financial Disclosure: The author declared that this study has received no financial support.

REFERENCES

1. American College of Obstetricians and Gynecologists' Committee on Practice Bulletins—Gynecology. ACOG practice bulletin no. 193: Tubal ectopic pregnancy. Obstet Gynecol 2018;131:e91–103. Erratum in: Obstet Gynecol 2019;133:1059.
2. Barnhart KT. Clinical practice. Ectopic pregnancy. N Engl J Med 2009;361:379–87.
3. Tang P, Li X, Li W, Li Y, Zhang Y, Yang Y. The trend of the distribution of ectopic pregnancy sites and the clinical characteristics of caesarean scar pregnancy. Reprod Health 2022;19:182.
4. Al Naimi A, Moore P, Brüggmann D, Krysa L, Louwen F, Bahlmann F. Ectopic pregnancy: A single-center experience over ten years. Reprod Biol Endocrinol 2021;19:79.
5. Barnhart K, Coutifaris C, Esposito M. The pharmacology of methotrexate. Expert Opin Pharmacother 2001;2:409–17.
6. Baggio S, Garzon S, Russo A, Ianniciello CQ, Santi L, Laganà AS, et al. Fertility and reproductive outcome after tubal ectopic pregnancy: Comparison among methotrexate, surgery and expectant management. Arch Gynecol Obstet 2021;303:259–68.

7. Rawal N, Sharma S, Soni B. A case of silent rupture of an ectopic pregnancy. Spinal Cord 2008;46:758–9.
8. Tenore JL. Ectopic pregnancy. Am Fam Physician 2000;61:1080–8.
9. Condous GS. Ultrasound diagnosis of ectopic pregnancy. Semin Reprod Med 2007;25:85–91.
10. Huchon C, Panel P, Kayem G, Bassot A, Nguyen T, Falissard B, et al. Is a standardized questionnaire useful for tubal rupture screening in patients with ectopic pregnancy? Acad Emerg Med 2012;19:24–30.
11. Nguyen TTH , Nguyen KO, Do TD, Phan THT , Nguyen ML. Results of surgical treatment of ectopic pregnancy at Ha Noi Obstetrics and Gynecology Hospital in 2023. Vietnam J Obstet Gynecol 2024;22:54–8.
12. Tahmina S, Daniel M, Solomon P. Clinical analysis of ectopic pregnancies in a tertiary care centre in southern India: A six-year retrospective study. J Clin Diagn Res 2016;10:QC13–6.
13. Perkins KM, Boulet SL, Kissin DM, Jamieson DJ; National ART Surveillance (NASS) Group. Risk of ectopic pregnancy associated with assisted reproductive technology in the United States, 2001-2011. Obstet Gynecol 2015;125:70–8.
14. Ankum WM, Mol BW, Van der Veen F, Bossuyt PM. Risk factors for ectopic pregnancy: A meta-analysis. Fertil Steril 1996;65:1093–9.
15. Gaskins AJ, Missmer SA, Rich-Edwards JW, Williams PL, Souter I, Chavarro JE. Demographic, lifestyle, and reproductive risk factors for ectopic pregnancy. Fertil Steril 2018;110:1328–37.
16. Backman T, Rauramo I, Huhtala S, Koskenvuo M. Pregnancy during the use of levonorgestrel intrauterine system. Am J Obstet Gynecol 2004;190:50–4.
17. Barik S, Malakar A, Laha S. Trends in ectopic pregnancy: A prospective observational study from a tertiary care center in eastern India. J South Asian Feder Obst Gynae 2020;12(3):172–7.
18. Ranji GG, Usha Rani G, Varshini S. Ectopic pregnancy: Risk factors, clinical presentation and management. J Obstet Gynaecol India 2018;68:487–92.
19. Shrivastava M, Parashar H, Modi JN. A clinical study of ectopic pregnancy in a tertiary care centre in central India. Int J Reprod Contracept Obstet Gynecol 2017;6:2485–90.
20. Yadav DP, Bhati I, Bhati BS. Ectopic pregnancy: A comprehensive analysis of risk factors and management. Int J Reprod Contracept Obstet Gynecol 2016;5:2723–7.

ORİJİNAL ÇALIŞMA - ÖZ

Hayat kurtarıcı acil cerrahi gerektiren ektopik gebeliklerin analizi

AMAÇ: Hayat kurtarıcı acil cerrahi uygulanan ektopik gebelikli (EP) hastaların demografik, ultrasonografik ve laboratuvar bulgularını ve sonuçlarını analiz etmek.
GEREÇ VE YÖNTEM: Bu retrospektif kesitsel çalışma 01 Ocak 2016 ile 01 Ocak 2020 tarihleri arasında Tersiyer Sevk Hastanesi'nde gerçekleştirildi. Çalışmaya 469 EP vakası dahil edildi. 469 hastanın verileri hastane kayıtlarından ve hasta dosyalarından alındı. Hayat kurtaran acil ameliyatların analizleri için, yalnızca hastaneye yatış sırasında, hastane takibinde veya MTX tedavisinden sonra yukarıda belirtilen ciddi belirti ve semptomları olan hastalar dahil edildi.
BULGULAR: Hastaların yaş ortalaması 31.2±5.65 yıldı. En genç hasta 15 yaşında iken, en yaşlı hasta 49 yaşındaydı. Hastaların %15,1'inde EP öyküsü vardı ve hastaların %29.4'ü sigara içiyordu. Doktora başvurma nedenleri 37 hastada (%7.9) şikayet yok, 37 hastada (%7.9) adet gecikmesi, 128 hastada (%27.3) karın ağrısı, 108 hastada (%23.0) karın ağrısı ile birlikte vajinal kanama ve 159 hastada (%33.9) sadece vajinal kanama idi. 4 (%0.9) hastada ektopik odak ultrason ile tespit edilemezken, 255 (%54.3) hastada ektopik odak sağ adneksiyal bölgede yer almaktaydı. Hastaların ameliyat öncesi ortalama hemoglobin düzeyi 12.4±1.33 g/dL idi. Ortanca hemoglobin değeri 12.6 (7.2-14.7) g/dL idi. MTX tedavisi olmaksızın ameliyat edilen hastalar ile MTX tedavisi sonrası ameliyat edilen hastaların demografik verileri, ultrason bulguları ve ameliyat öncesi ve sonrası laboratuvar sonuçları karşılaştırıldığında yaş, parite, ektopik odağın maksimum çapı, ameliyat öncesi hemoglobin değeri, ameliyat öncesi beyaz küre sayısı, karında serbest sıvı ve kontraseptif yöntemler açısından anlamlı farklılıklar olduğu görüldü.
SONUÇ: EP jinekolojik aciller arasında önemli bir yer tutmaktadır. Tanıda olası bir gecikme hayatı tehdit eden durumlara yol açabilir ve bu aşamadan sonra tek tedavi hayat kurtarıcı acil cerrahi müdahaledir.

Anahtar sözcükler: Ektopik gebelik; hayat kurtarıcı acil cerrahi; jinekolojik acil; rüptür.

Ulus Travma Acil Cerrahi Derg 2025;30(2):125-132 DOI: 10.14744/tjtes.2024.86087