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Original Research Article

# A Study of Non-Obstetric Surgical Emergencies during Pregnancy

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**Abstract**

**Background:** Non-obstetric surgical emergencies during pregnancy are uncommon but present unique diagnostic and management challenges due to overlapping obstetric symptoms and concerns for fetal safety. Early recognition and timely intervention are essential to optimize maternal and fetal outcomes. This study aimed to evaluate the spectrum, management, and outcomes of non-obstetric surgical emergencies in pregnant women.

**Material and Methods:** A prospective observational study was conducted at a tertiary care hospital over 24 months. Pregnant women presenting with acute non-obstetric surgical conditions were enrolled. Data on demographic characteristics, clinical presentation, diagnostic workup, type of surgical emergency, management approach, and maternal and fetal outcomes were collected using a structured case record form. Patients were managed by a multidisciplinary team.

**Results:** A total of 120 patients were included; mean age was 26.8 ± 4.3 years. Most patients were aged 21–30 years (68.3%) and multigravida (53.3%). The second trimester was the most common period of presentation (48.3%). Abdominal pain was present in all cases, followed by nausea/vomiting (63.3%) and fever (40.0%). Acute appendicitis (38.3%) and cholelithiasis/cholecystitis (23.3%) were the predominant diagnoses. Surgical intervention was required in 68.3% of patients, mostly as emergency procedures (73.2%), with open surgery performed in 70.7% and laparoscopic in 29.3%. Maternal outcomes were largely favorable, with 85.0% recovering uneventfully; postoperative complications occurred in 15.0%, and there were no maternal deaths. Fetal outcomes were uncomplicated in 80.0% of cases, while preterm labor (11.7%), fetal distress (5.0%), and intrauterine fetal demise (3.3%) were noted. Surgical intervention was significantly associated with the second trimester ($p = 0.03$).

**Conclusion:** Acute appendicitis and biliary tract disease are the leading non-obstetric surgical emergencies in pregnancy. Prompt evaluation and timely multidisciplinary management result in favorable maternal and fetal outcomes, highlighting the importance of early surgical intervention when indicated.

**Keywords:** Non-Obstetric Surgical Emergencies, Pregnancy, Acute Abdomen, Maternal Outcome, Fetal Outcome.



## Introduction

Non-obstetric surgical emergencies during pregnancy are relatively uncommon but represent important clinical challenges due to the physiological changes of pregnancy, diagnostic uncertainty, and the dual concern for maternal and fetal well-being [1,2]. Recent literature indicates that approximately 0.2–2% of pregnant women will require non-obstetric surgery during gestation, with acute appendicitis and benign biliary disease being the most frequently encountered conditions necessitating urgent intervention [2,3]. The diagnostic evaluation of such cases is often complicated by anatomical and physiological adaptations that occur during pregnancy, including displacement of abdominal organs and overlapping symptoms such as nausea and abdominal discomfort, which may lead to delays in diagnosis and treatment [1,4]. Acute appendicitis remains the most common non-obstetric surgical emergency in pregnancy, with an estimated incidence of approximately 0.04–0.2%, and can present throughout all trimesters, though second-trimester

presentations are frequently reported [3,5]. Biliary tract disease, including symptomatic cholelithiasis and cholecystitis, is the second most common surgical pathology and is attributed to hormonal influences on bile composition and gallbladder motility during pregnancy [3,6]. Other non-obstetric causes of acute abdomen that may require surgical evaluation include intestinal obstruction, urolithiasis, and adnexal torsion, among less common conditions [1,2].

Prompt recognition and a multidisciplinary approach involving obstetricians, surgeons, anesthesiologists, and neonatologists are essential, as delayed intervention has been associated with increased risks of adverse outcomes, including preterm labor and fetal loss [4,7]. While conservative management may be considered in select scenarios, surgical intervention — when indicated — has generally been shown to be safe with favorable maternal and fetal outcomes, particularly when performed in a timely manner and with appropriate perioperative care [2,3].

The present study examines the clinical spectrum, management strategies, and outcomes of pregnant patients presenting with non-obstetric surgical emergencies at a tertiary care center, with the aim of contributing evidence to optimize diagnostic and therapeutic protocols in this unique patient population.

## Material and Methods

**Study design and setting:** This study was designed as a hospital-based prospective observational study conducted at a tertiary care teaching hospital. The institution functions as a referral center for surrounding urban and rural regions, managing both routine and high-risk pregnancies.

**Study Population:** All pregnant women presenting to the emergency department with acute non-obstetric surgical conditions requiring surgical evaluation during the study period were assessed for eligibility.

**Inclusion Criteria:**

- Pregnant women of any age and gestational age
- Presence of an acute surgical abdomen or surgical emergency unrelated to pregnancy
- Conditions requiring urgent surgical consultation, with or without operative intervention
- Willingness to provide informed consent (or consent from a legally acceptable representative)

**Exclusion Criteria:**

- Obstetric emergencies (e.g., ectopic pregnancy, placental abruption, uterine rupture)
- Elective non-obstetric surgical procedures
- Patients managed entirely on an outpatient basis
- Pregnant women with traumatic injuries
- Patients who declined consent

**Sample Size:** Based on the average annual emergency admissions of pregnant women at the study center and previously reported incidence rates of non-obstetric surgical emergencies during pregnancy (approximately 0.5–2.0%), a convenience sample size of 120 patients was targeted over the study duration. This sample size was considered adequate to describe the clinical spectrum, management patterns, and maternal–fetal outcomes with acceptable precision in an observational framework.

**Data Collection:** After enrollment, data were collected using a prestructured and pretested case record form. Information was obtained through patient interviews, clinical examination, operative records, and review of medical files. The following variables were recorded:

- **Demographic characteristics:** age, parity, gravidity
- **Obstetric details:** gestational age, trimester at presentation, antenatal complications
- **Clinical presentation:** presenting symptoms, duration of symptoms, vital parameters
- **Diagnostic evaluation:** laboratory investigations, ultrasonography, and other imaging modalities used with fetal safety considerations
- **Type of surgical emergency:** appendicitis, biliary disease, intestinal obstruction, urolithiasis, or other conditions
- **Management approach:** conservative treatment, timing of surgery, type of anesthesia, surgical procedure performed
- **Perioperative details:** intraoperative findings, operative duration, complications
- **Maternal outcomes:** postoperative complications, length of hospital stay, need for intensive care
- **Fetal outcomes:** fetal distress, preterm labor, intrauterine fetal demise, neonatal outcome where applicable

**Management Protocol:** All patients were managed by a multidisciplinary team involving surgeons, obstetricians, anesthesiologists, and neonatologists. Diagnostic and therapeutic decisions were individualized, balancing maternal benefit and fetal safety. Fetal monitoring was performed preoperatively and postoperatively wherever gestational age permitted. Prophylactic tocolysis

and corticosteroids were administered when clinically indicated.

**Outcome Measures:** The primary outcome was the distribution and frequency of various non-obstetric surgical emergencies during pregnancy. Secondary outcomes included maternal morbidity, fetal complications, and factors influencing surgical timing and outcomes.

**Statistical Analysis:** Data were entered into Microsoft Excel and analyzed using Statistical Package for the Social Sciences (SPSS) version 26.0. Continuous variables were expressed as mean ± standard deviation or median with interquartile range, depending on data distribution. Categorical variables were summarized as frequencies and percentages. Associations between categorical variables were assessed using the chi-square test. A p value <0.05 was considered statistically significant.

## Results

A total of 120 pregnant women presenting with non-obstetric surgical emergencies were included in the study. The mean age of the participants was 26.8 ± 4.3 years, with the majority (68.3%) aged 21–30 years. Primigravida constituted 46.7% of the cohort, while multigravida accounted for 53.3%. Regarding gestational age at presentation, 18.3% were in the first trimester, 48.3% in the second trimester, and 33.4% in the third trimester (Table 1). All patients presented with abdominal pain, while other common symptoms included nausea and/or vomiting (63.3%), fever (40.0%), and abdominal tenderness (81.7%). Guarding or rigidity was observed in 26.7% of patients, altered bowel habits in 23.3%, and urinary symptoms in 18.3% (Table 2). Among the surgical emergencies, acute appendicitis was the most frequent diagnosis (38.3%), followed by symptomatic cholelithiasis or cholecystitis (23.3%). Intestinal obstruction was observed in 11.7%, urolithiasis in 10.0%, ovarian torsion in 8.3%, perforated peptic ulcer in 5.0%, and other less common conditions in 3.4% (Table 3). Regarding management, 68.3% of patients underwent surgical intervention, while 31.7% were managed conservatively. Among those undergoing surgery, 73.2% were operated on as emergencies (<24 hours), and 26.8% underwent early elective procedures (24–72 hours). Open procedures were performed in 70.7% and laparoscopic procedures in 29.3% of operated cases. General anesthesia was used in 92.7%, and regional anesthesia in 7.3% (Table 4).

Maternal outcomes were largely favorable, with 85.0% recovering uneventfully. Postoperative complications occurred in 15.0% of patients, including surgical site infection in 8.3%, postoperative ileus in 5.0%, and ICU admission in 3.3%. No maternal deaths were reported. Fetal outcomes were uncomplicated in 80.0% of cases; preterm labor occurred in 11.7%, fetal distress in 5.0%, and intrauterine fetal demise in 3.3% (Table 5). Analysis of the association between trimester and need for surgical intervention showed a statistically significant relationship (p = 0.03). Surgical intervention was most commonly required in the second trimester (44/58), followed by the third (20/40) and first trimester (18/22), while conservative management was proportionally higher in the third trimester (Table 6).

**Table 1: Demographic and Obstetric Characteristics of the Study Population (n = 120)**

| Variable | Value |
|---|---|
| Mean age (years), mean ± SD | 26.8 ± 4.3 |
| Age group (years), n (%) | |
| ≤20 | 14 (11.7) |
| 21–30 | 82 (68.3) |
| >30 | 24 (20.0) |
| Gravidity, n (%) | |
| Primigravida | 56 (46.7) |
| Multigravida | 64 (53.3) |
| Trimester at presentation, n (%) | |
| First trimester | 22 (18.3) |
| Second trimester | 58 (48.3) |
| Third trimester | 40 (33.4) |

**Table 2: Clinical Presentation at Admission (n = 120)**

| Symptom / Sign | Number (%) |
|---|---|
| Abdominal pain | 120 (100) |
| Nausea and/or vomiting | 76 (63.3) |
| Fever | 48 (40.0) |
| Abdominal tenderness | 98 (81.7) |
| Guarding or rigidity | 32 (26.7) |
| Altered bowel habits | 28 (23.3) |
| Urinary symptoms | 22 (18.3) |

**Table 3: Distribution of Non-Obstetric Surgical Emergencies (n = 120)**

| Diagnosis | Number (%) |
|---|---|
| Acute appendicitis | 46 (38.3) |
| Symptomatic cholelithiasis / cholecystitis | 28 (23.3) |
| Intestinal obstruction | 14 (11.7) |
| Urolithiasis | 12 (10.0) |
| Ovarian torsion | 10 (8.3) |
| Perforated peptic ulcer | 6 (5.0) |
| Others* | 4 (3.4) |

**Table 4: Management Approach and Surgical Details (n = 120)**

| Parameter | Number (%) |
|---|---|
| Mode of management | |
| Conservative | 38 (31.7) |
| Surgical intervention | 82 (68.3) |
| Timing of surgery (n = 82) | |
| Emergency (<24 hours) | 60 (73.2) |
| Early elective (24–72 hours) | 22 (26.8) |
| Type of surgery performed (n = 82) | |
| Open procedures | 58 (70.7) |
| Laparoscopic procedures | 24 (29.3) |
| Type of anesthesia | |
| General anesthesia | 76 (92.7) |
| Regional anesthesia | 6 (7.3) |

**Table 5: Maternal and Fetal Outcomes (n = 120)**

| Outcome | Number (%) |
|---|---|
| Maternal outcomes | |
| Uneventful recovery | 102 (85.0) |
| Postoperative complications | 18 (15.0) |
| Surgical site infection | 10 (8.3) |
| Postoperative ileus | 6 (5.0) |
| ICU admission | 4 (3.3) |
| Maternal mortality | 0 (0) |
| Fetal outcomes | |
| No fetal complications | 96 (80.0) |
| Preterm labor | 14 (11.7) |
| Fetal distress | 6 (5.0) |
| Intrauterine fetal demise | 4 (3.3) |

**Table 6: Association between Trimester and Need for Surgical Intervention**

| Trimester | Surgical (n) | Conservative (n) | Total | p value |
|---|---|---|---|---|
| First | 18 | 4 | 22 | **0.03** |
| Second | 44 | 14 | 58 | |
| Third | 20 | 20 | 40 | |
| **Total** | **82** | **38** | **120** | |

## Discussion

In this prospective observational study of 120 pregnant women with non-obstetric surgical emergencies, acute appendicitis and biliary tract disease were the leading diagnoses, consistent with previously published data indicating similar distributions of surgical pathologies in pregnancy [8,9]. Our finding that the second trimester was the most frequent period requiring surgical intervention aligns with reports suggesting that physiological changes and symptom presentation often make the second trimester the most common period for operative management [10]. Maternal outcomes in our cohort were largely favorable, with a low incidence of serious postoperative complications and no maternal mortality.

This corresponds with previous studies demonstrating that, with appropriate perioperative care, non-obstetric abdominal surgery can be safely performed during pregnancy without significant increases in maternal morbidity or mortality [11,12]. However, adverse fetal outcomes such as preterm labor and intrauterine fetal demise were observed in a minority of cases, reflecting the combined effects of surgical stress, underlying disease severity, and gestational age [8,10].

Less frequent conditions in our cohort, including intestinal obstruction and urolithiasis, contribute to diagnostic and management complexity. Intestinal obstruction, although rare, is associated with significant maternal and fetal risk and often necessitates prompt surgical intervention when conservative measures fail [13]. Symptomatic urolithiasis during pregnancy has been linked to an increased risk of preterm delivery and other obstetric complications, emphasizing the importance of early recognition and multidisciplinary management [14].

Surgical technique and timing remain important considerations. Both open and minimally invasive approaches can be safely applied during pregnancy when adapted to physiological changes and performed by experienced teams [15]. In cases such as ovarian torsion, recent evidence suggests that laparotomy and laparoscopy are both viable options, with maternal and fetal outcomes comparable when appropriately selected [9].

## Conclusion

Non-obstetric surgical emergencies during pregnancy, though relatively uncommon, pose significant diagnostic and management challenges due to overlapping symptoms with obstetric conditions and concerns for fetal safety. In this study, acute abdominal pain was the most frequent presenting symptom, with acute appendicitis and biliary tract disease being the predominant diagnoses, most commonly occurring in the second trimester. Timely evaluation and appropriately indicated surgical intervention were associated with favorable maternal outcomes and minimal morbidity, while fetal complications, primarily preterm labor, were relatively infrequent. These findings highlight the importance of a multidisciplinary approach and prompt decision-making, emphasizing that necessary surgical procedures should not be delayed solely due to pregnancy, as early intervention can optimize both maternal and fetal outcomes.

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