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Perforated Appendicitis with Feculent Peritonitis Presenting as Inevitable Abortion at 16 Weeks' Gestation: A Case Report

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Conflicts of Interest: Nil

Abstract

Background: Acute appendicitis is the most common non-obstetric surgical condition requiring operative intervention during pregnancy. Diagnosis can be challenging because pregnancy alters gastrointestinal symptoms, leukocyte counts, and the anatomical position of the appendix.

Perforation and generalized peritonitis are associated with increased maternal and fetal morbidity. Pregnancy loss is uncommon in uncomplicated appendicitis but becomes substantially more frequent when perforation and peritonitis occur.

Case presentation: A 21-year-old G4P3 at 16 weeks' gestation initially presented with lower abdominal pain and loose stools and was managed as gastroenteritis. She re-presented three days later with fever, worsening abdominal pain, blood-stained vaginal discharge, cervical dilatation, and bulging membranes, leading to a diagnosis of inevitable abortion. Following fetal expulsion, she developed marked abdominal pain, tachycardia, and tachypnoea. Emergency laparotomy revealed 900 mL of feculent peritoneal fluid and a perforated appendix densely adherent to the sigmoid colon. Appendectomy and peritoneal lavage were performed, and she recovered uneventfully.

Conclusion: Complex intraperitoneal fluid, reduced bowel activity, neutrophilia, fever, guarding, and pain disproportionate to the apparent obstetric diagnosis should prompt consideration of a concurrent surgical abdomen.

Keywords: acute appendicitis; pregnancy; perforation; feculent peritonitis; inevitable abortion; appendectomy; surgical abdomen

Introduction: Acute appendicitis is the most common non-obstetric surgical condition requiring operative intervention during pregnancy. Diagnosis can be challenging because pregnancy alters gastrointestinal

symptoms, leukocyte counts, and the anatomical position of the appendix [1,2].

Appendicitis during pregnancy has been associated with adverse maternal and fetal outcomes, with complications increasing when perforation occurs [2,4].

The present case is unusual because the patient initially presented with symptoms compatible with gastrointestinal disease, subsequently developed clinical features of inevitable abortion, and only after fetal expulsion was perforated appendicitis recognized. A similar diagnostic overlap has been described in a second-trimester case in which appendicitis was obscured by incomplete abortion [5]. The case was reported in accordance with the SCARE 2020 guideline [6].

This report highlights the importance of maintaining a broad differential diagnosis in pregnant patients with abdominal pain, particularly when clinical findings are disproportionate to the apparent obstetric diagnosis.

Case Presentation

A 21-year-old G4P3 woman at 16 weeks' gestation, with no documented relevant medical or surgical history, drug history, or allergies, presented with lower abdominal pain and three episodes of non-bloody, non-mucoid loose stools associated with general malaise. Her blood group was O positive.

At the first presentation, she denied fever, headache, dizziness, vaginal discharge, and dysuria. She appeared well, was afebrile, anicteric, and not pale. Her temperature was 36.8 °C, pulse 86 beats/min, respiratory rate 20 breaths/min, and blood pressure 108/60 mmHg. Abdominal examination revealed a gravid uterus with mild suprapubic tenderness. Fetal cardiac activity was present. She was admitted and treated as gastroenteritis with intravenous cefuroxime, metronidazole, and paracetamol for 24 hours, followed by oral antibiotics, and was discharged.

Three days later, she re-presented with worsening lower abdominal pain, blood-stained vaginal discharge, and general malaise. She was febrile at 38.1 °C, with pulse 86 beats/min, respiratory rate 20 breaths/min, and blood pressure 110/60 mmHg. She was in obvious pain and unable to stand upright. The abdomen was generally tender with guarding, with maximal tenderness later localised to the suprapubic region. Sterile speculum examination demonstrated a dilated external cervical os with bulging membranes.

Laboratory investigations showed a white blood cell count of 11.39 × 10^9/L at the first presentation and 12.08 × 10^9/L at the second presentation. Neutrophils were 85.2% and 87.9%, respectively. Haemoglobin was 12.6 g/dL and 12.9 g/dL. Malaria parasites were not detected, and urine microscopy was unremarkable.

Test	First visit	Second visit
WBC (×10^9/L)	11.39	12.08
Neutrophils	85.2%	87.9%
Haemoglobin (g/dL)	12.6	12.9
Malaria parasites	None	None
Urine microscopy	Unremarkable	Unremarkable

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Abdominopelvic ultrasonography at the second presentation showed a single live intrauterine gestation at 16 weeks, a dilated internal cervical os, significant fluid in the pouch of Douglas, generalized reduction in bowel peristalsis, and a moderate volume of intra-abdominal fluid with internal echoes. The appendix was not visualized.

Diagnosis and Treatment

At the second presentation, the cervical dilatation and bulging membranes were clinically consistent with inevitable abortion. Intravenous ceftriaxone was administered for 48 hours, with paracetamol and buscopan for symptom control. Intravenous oxytocin was commenced to expedite fetal expulsion.

After fetal expulsion, the patient developed severe abdominal pain and difficulty breathing. Her blood pressure was 100/80 mmHg, pulse 121 beats/min, respiratory rate 52 breaths/min, temperature 36.1 °C, and oxygen saturation 96%. Abdominal examination showed generalized tenderness and guarding, with maximal tenderness around the umbilical region.

The general surgery team was involved because of concern for an acute surgical abdomen and possible bowel involvement. The patient was prepared for emergency exploratory laparotomy under general anaesthesia.

Emergency exploratory laparotomy was performed.

Intra-operative findings:

- Approximately 900 mL of feculent fluid was present in the peritoneal cavity, with extensive fibrinous exudate over segments of small and large bowel (Figure 3).
- The appendix was perforated and densely adherent to the sigmoid colon, forming an inflammatory mass (Figures 1 and 2). The sigmoid colon itself was intact.
- The uterus and adnexa were normal, with feculent fluid also present in the pouch of Douglas.

Appendectomy and thorough peritoneal lavage were performed.

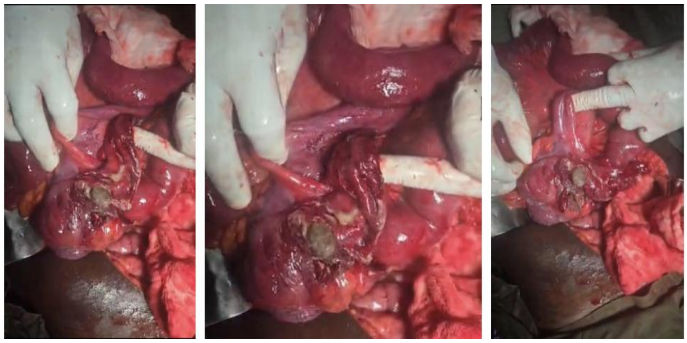


Figure 1: Intra-operative views (a–c) of the perforated appendix showing the perforation site with faecal material.



Figure 2: Appendix adherent to the sigmoid colon, discharging feculent fluid.

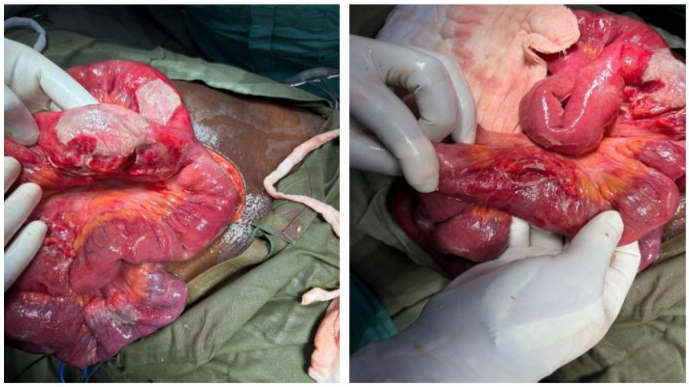


Figure 3: Fibrinous exudates on the small and large bowel loops (a, b).

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Post-operative Care and Outcome

Post-operatively, the patient was stable and transferred to the recovery ward. A nasogastric tube was inserted, and she was subsequently transferred to the surgical ward for continued monitoring. She was kept nil per os, received maintenance intravenous fluids, and continued intravenous antibiotics for 72 hours.

By post-operative day 5, there was significant clinical improvement and she was discharged on oral antibiotics for a further 7 days. Subsequent gynaecological and surgical follow-up visits were uneventful.

Timeline

Time	Event
Day 0	First presentation with lower abdominal pain and passage of loose stools. Admitted and managed as gastroenteritis.
Day 1	Discharged on oral antibiotics after 24 hours of IV therapy.
Day 3	Re-presented with fever, severe lower abdominal pain, and blood-stained vaginal discharge. Cervical dilatation with bulging membranes and ultrasound findings led to a diagnosis of inevitable abortion.
Day 3	Oxytocin given, fetal expulsion, then acute deterioration. Emergency exploratory laparotomy.
Post-op 0–2	NPO, nasogastric tube, IV fluids and IV antibiotics for 72 hours.
Post-op day 5	Discharged on 7 days of oral antibiotics.
Follow-up	Gynaecology and surgery clinic visits uneventful.

Discussion

Acute appendicitis remains a diagnostic challenge during pregnancy because physiological and anatomical changes can modify the clinical presentation. Delayed diagnosis is associated with a greater risk of perforation and adverse maternal and fetal outcomes [1,2,4].

Diagnostic difficulty

In this patient, the initial symptoms of loose stools and lower abdominal pain were attributed to gastroenteritis. The absence of fever and haemodynamic instability at the first presentation may also have reduced suspicion of a surgical abdomen. On re-presentation, the clinical picture became more concerning, with fever, severe pain, guarding, and marked neutrophilia despite only a modest elevation in the total white blood cell count. Physiological leukocytosis in pregnancy limits the diagnostic value of the total leukocyte count, making the clinical trajectory particularly important [1,2].

The patient did not initially have fever or haemodynamic instability. This illustrates that clinically significant appendicitis may initially occur without overt systemic toxicity.

The white blood cell count was only mildly elevated, but there was significant neutrophilia on both presentations. Persistent neutrophilia in association with worsening abdominal pain should increase suspicion for an intra-abdominal inflammatory process.

The ultrasound findings at the second presentation were particularly important. Although the appendix was not visualized, there was significant fluid in the pouch of

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Douglas, moderate complex intraperitoneal fluid with internal echoes, and generalized reduction in bowel peristalsis. These findings, when combined with fever, guarding, neutrophilia, and severe abdominal pain, should raise concern for an intra-abdominal inflammatory or septic process.

The initial antimicrobial therapy may have modified the clinical inflammatory response, but the available clinical information does not allow the extent of this effect to be determined.

Appendicitis, perforation and pregnancy loss

The cervical dilatation and bulging membranes provided a convincing explanation for the pregnancy-related symptoms and led to the diagnosis of inevitable abortion.

The temporal relationship between the underlying appendiceal perforation, intra-abdominal inflammation, and pregnancy loss cannot establish a causal relationship from a single case. Severe intra-abdominal inflammation and maternal systemic illness may adversely affect pregnancy, but this report demonstrates an association in time rather than proof of causation.

Published evidence indicates that appendicitis during pregnancy is associated with adverse pregnancy outcomes and that complications are more frequent when appendicitis is perforated [2,4]. In a series of 94 appendectomies during pregnancy, the overall perforation rate was 14.9%, and atypical presentations were particularly common during the second trimester [4].

In a review of 52 pregnant patients with suspected acute appendicitis, appendiceal perforation occurred in 14% of patients, and fetal losses occurred among patients with diseased appendices, including cases of perforated appendicitis [7]. These findings reinforce the importance of early diagnostic consideration rather than waiting for classical clinical findings.

A particularly relevant precedent is the report by Wright of second-trimester acute appendicitis in which the underlying pathology was obscured by incomplete abortion. The patient deteriorated after uterine evacuation, and a ruptured appendix was subsequently identified at laparotomy [5]. The similarity to the present case emphasizes the importance of maintaining a broad differential diagnosis when an apparent obstetric emergency coexists with disproportionate abdominal findings.

Significance of the intraperitoneal fluid

One of the most important retrospective findings in this case was the presence of moderate intraperitoneal fluid with internal echoes on ultrasound. Complex intraperitoneal fluid in a patient with severe abdominal pain, guarding, fever, and neutrophilia should prompt consideration of blood, pus, inflammatory exudate, or gastrointestinal contamination.

In this case, the operative finding of approximately 900 mL of feculent fluid demonstrated that the ultrasound abnormality represented significant intra-abdominal contamination.

This emphasizes the importance of interpreting ultrasound findings within the overall clinical context rather than considering the obstetric findings in isolation.

The role of imaging in suspected appendicitis during pregnancy

Ultrasonography is an appropriate first-line investigation in pregnant patients with acute abdominal pain. When ultrasound is inconclusive and significant pathology remains suspected, MRI can provide additional information without ionizing radiation. ACOG identifies ultrasonography and MRI as preferred imaging techniques during pregnancy and states that CT should not be withheld when clinically necessary and when the maternal benefit outweighs the theoretical fetal risk [3].

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In this case, ultrasound demonstrated several non-obstetric abnormalities, including reduced bowel motility and complex intraperitoneal fluid. In a patient with persistent severe abdominal pain, guarding, and complex free fluid, further assessment for an acute surgical abdomen would therefore be appropriate even when an obstetric diagnosis is present.

Management of appendicitis in pregnancy

Current SAGES guidance supports operative management of acute appendicitis during pregnancy and provides recommendations for laparoscopic versus open approaches according to gestational anatomy, clinical circumstances, and surgical expertise [8].

ACOG emphasizes that medically necessary non-obstetric surgery should not be delayed because of pregnancy [3].

In this patient, generalized feculent contamination and extensive inflammatory change necessitated emergency laparotomy and peritoneal lavage. The dense adhesion between the perforated appendix and sigmoid colon created an inflammatory mass, but careful intra-operative assessment demonstrated that the sigmoid colon remained intact, allowing appendectomy without bowel resection.

Conclusion

Perforated appendicitis with feculent peritonitis can coexist with, and clinically overlap, inevitable abortion in the second trimester. In pregnant patients with abdominal pain, fever, guarding, persistent neutrophilia, reduced bowel activity, or complex intraperitoneal fluid, a concurrent surgical abdomen should remain in the differential diagnosis even when cervical dilatation or pregnancy loss appears to provide an alternative explanation. Early multidisciplinary assessment and timely surgical intervention are essential in complicated appendicitis during pregnancy.

Learning Points

- Acute appendicitis should remain in the differential diagnosis of acute abdominal pain throughout pregnancy.
- Atypical localization of pain does not exclude appendicitis in pregnancy.
- Persistent neutrophilia with worsening abdominal pain warrants reassessment even when the total white blood cell count is only mildly elevated.
- Complex intraperitoneal fluid with internal echoes should raise concern for significant intra-abdominal pathology.
- Cervical dilatation, bulging membranes, or pregnancy loss does not exclude a concurrent surgical abdomen.
- Multidisciplinary management is important when obstetric and surgical pathology may coexist.

Multidisciplinary management involving obstetrics and gynaecology, general surgery, radiology, anaesthesia and perioperative teams is important in pregnant patients with suspected acute abdominal surgical pathology.

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