

Acute Surgical Emergencies during Pregnancy: Diagnostic and Therapeutic Challenges Illustrated by Clinical Cases and Literature Review

Astou Coly Niassy Diallo^{1,2}, Ibrahim Rahadat^{1,2}, Ibrahima Ka¹, Babacar Biaye², Dialtabe Ibrahima Guesse Ba³, Papa Adama Dieng³, Marie-Édouard Faye¹, Jean-Charles Moreau¹

¹Department of General Surgery, Idrissa Pouye Hospital, Dakar, Senegal

²Gynecology and Obstetrics Clinic, Aristide Le Dantec Hospital, Dakar, Senegal

³Department of Cardio-Thoracic Surgery, Dakar, Senegal

Email: medacn@gmail.com

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Abstract

Background: Acute surgical emergencies during pregnancy are uncommon but carry high maternal-fetal risks. The physiological changes of gestation often mask symptoms, leading to diagnostic delays and therapeutic dilemmas. **Objective:** To illustrate the diagnostic and therapeutic challenges of non-obstetric surgical emergencies in pregnancy through four clinical cases managed in tertiary and district-level hospitals in Senegal, and to contextualize these cases with a literature review. **Cases:** We describe: (1) a juxtarenal and infrarenal abdominal aortic aneurysm with impending rupture at 29 weeks, (2) a sigmoid volvulus in early pregnancy, (3) an infected Bartholin's gland cyst at 34 weeks with risk of para-rectal extension and hemorrhage, and (4) adnexal torsion mimicking ruptured ectopic pregnancy at 12 weeks in a woman later found to carry an intrauterine pregnancy complicated by fetal adrenal neuroblastoma. **Conclusion:** These cases highlight the diversity and severity of surgical emergencies in pregnancy, their frequent diagnostic ambiguity, and the need for rapid, multidisciplinary management. Awareness, timely imaging, and individualized therapeutic strategies are essential to improve outcomes, especially in resource-limited settings.

Keywords

Pregnancy, Surgical Emergency, Abdominal Aortic Aneurysm, Sigmoid Volvulus, Bartholin's Abscess, Adnexal Torsion, Maternal-Fetal Outcome

1. Introduction

Acute surgical emergencies during pregnancy are rare but often catastrophic for both mother and fetus. Physiological and anatomical changes—such as displacement of abdominal organs, increased intra-abdominal pressure, and altered immune responses—can obscure clinical presentation, delay diagnosis, and complicate management [1] [2].

The prevalence of non-obstetric surgical interventions during pregnancy is estimated at 0.75% - 2% [3], but life-threatening conditions such as bowel obstruction, vascular rupture, or severe pelvic sepsis are less frequent yet carry high morbidity.

Sigmoid volvulus is the leading cause of large bowel obstruction in pregnancy, representing up to 44% of reported cases [4]. Abdominal aortic aneurysm (AAA) is extremely rare during pregnancy (<50 cases reported worldwide) but associated with catastrophic rupture risk [5]. Bartholin's gland abscess, though usually benign, can cause severe complications in pregnancy due to rapid extension and risk of sepsis [6]. Finally, adnexal torsion is an emergency that may mimic ectopic pregnancy, with risks of adnexal necrosis and pregnancy loss if diagnosis is delayed.

In Senegal, published data on these conditions are scarce. This article presents four illustrative cases of acute surgical emergencies during pregnancy, managed in Dakar, highlighting diagnostic pitfalls, therapeutic strategies, and maternal-fetal outcomes.

2. Materials and Methods

This work is a **descriptive case series** of four rare but severe surgical emergencies encountered during pregnancy in tertiary and district-level hospitals in Dakar. Cases were selected for their clinical rarity, severity, and educational relevance.

Data were retrieved from medical records, operative notes, imaging reports, and follow-up files. For each case, the following were analyzed:

- 1) **Maternal characteristics** (age, parity, gestational age, history).
- 2) **Clinical presentation** (symptoms, examination findings).
- 3) **Diagnostic approach** (laboratory, imaging, operative findings).
- 4) **Management** (surgical or medical interventions, anesthetic approach, peri-operative care).
- 5) **Outcomes** (maternal recovery, fetal course, neonatal status).

No attempt was made to calculate incidence or prevalence. Instead, this series is intended to provide illustrative clinical insights and to contextualize management challenges in resource-limited settings.

3. Case Reports

3.1. Case 1—Juxtarenal and Infraarenal Abdominal Aortic Aneurysm

A 32-year-old multigravida at 29 weeks presented with sudden abdominal and lumbar pain, hypotension, and tachycardia. Examination revealed a pulsatile ab-

dominal mass. Ultrasound and CT angiography confirmed a 6.8 cm juxtarenal and infrarenal abdominal aortic aneurysm with signs of impending rupture.

She underwent emergency endovascular repair under multidisciplinary monitoring, with continuous fetal surveillance. Postoperative recovery was favorable, and pregnancy progressed uneventfully until elective cesarean delivery at 37 weeks, yielding a healthy neonate. **Figure 1** shows the pre-operative angio-CT.

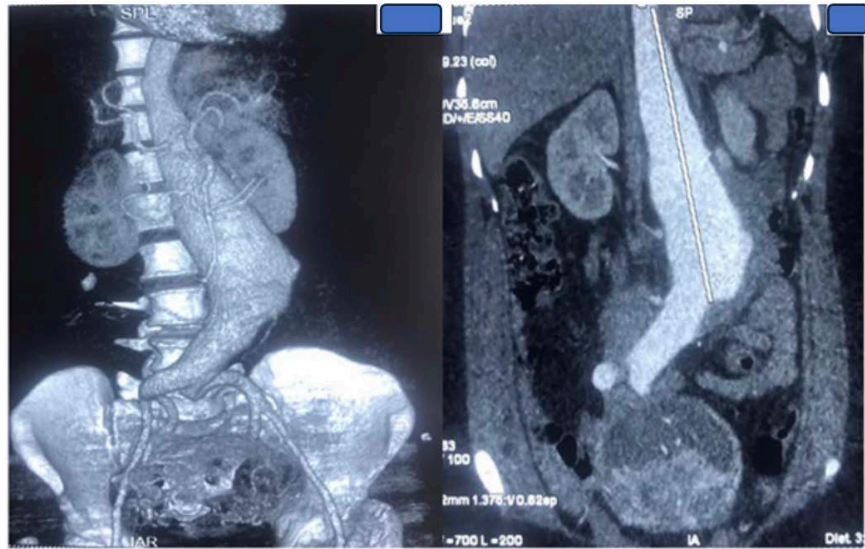


Figure 1. Abdominal aortic aneurysm-angio scan of the abdominal aorta and lower limbs which revealed an aneurysm of the abdominal aorta measuring 85* 69 mm axially and 191 mm in height.

3.2. Case 2—Sigmoid Volvulus (10 Weeks)

A 47-year-old (G5P4) had progressive distension, pain, and absolute constipation. As shown in **Figure 2** Radiography/CT confirmed sigmoid volvulus without perforation. Endoscopic detorsion failed; laparotomy with sigmoidectomy and Bouilly-Volkman colostomy was performed, with restoration of continuity at 28 weeks. She delivered at term vaginally. Volvulus is among the leading causes of bowel obstruction in pregnancy and warrants early suspicion [6]-[10], Perrot 2016.

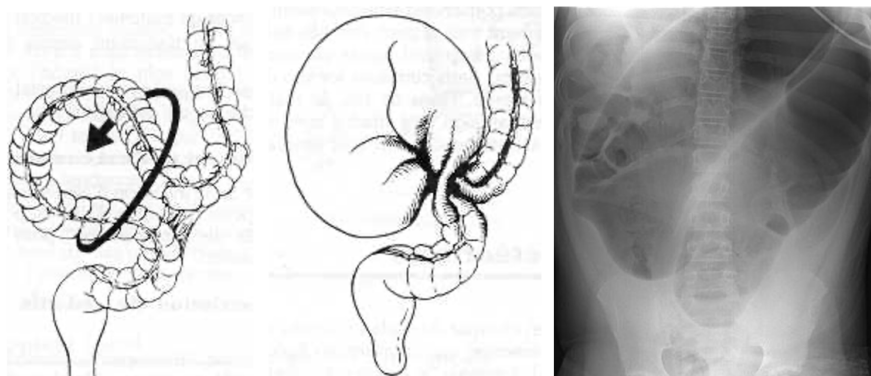


Figure 2. Pathophysiology and radiological features of intestinal volvulus.

3.3. Case 3—Infected Bartholin's Gland Cyst (34 Weeks)

A 24-year-old primigravida had a painful 15 cm vulvar mass with fever. Incision and drainage were performed; culture grew *E. coli* and antibiotics were adjusted accordingly [11] [12]. Pregnancy proceeded to term vaginal delivery.

Figure 3 illustrates the clinical presentation and the corresponding ultrasound findings.

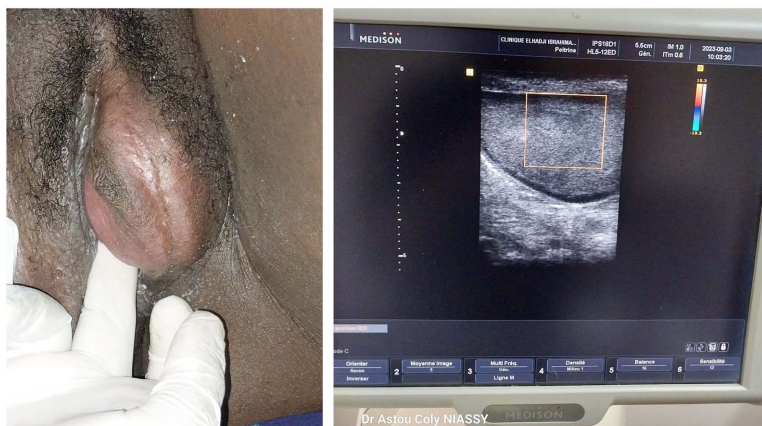


Figure 3. Clinical presentation and ultrasound features of the patient.

3.4. Case 4—Adnexal Torsion Mimicking Ruptured Ectopic Pregnancy

A 27-year-old newly married woman presented with acute left-sided pelvic pain, peritoneal irritation, and positive pregnancy test.

Ultrasound: empty uterus, heterogeneous left adnexal mass, 6 cm fundic myoma, and Douglas pouch effusion.

Suspicion: ruptured ectopic pregnancy.

Emergency laparoscopy revealed left adnexal torsion on an ovarian cyst of organic appearance, associated with a 6 cm type-7 fundic myoma. Detorsion and myomectomy were performed.



Figure 4. Hyperechoic left adrenal fetal mass (neuroblastoma) with progressive growth during ultrasound follow-up.

Unexpectedly, the pregnancy was intrauterine and evolutive. It progressed to term but was later complicated by the diagnosis of a left fetal adrenal neuroblastoma (**Figure 4**), currently under surveillance.

Table 1. Summary of clinical, diagnostic, and therapeutic features.

Case	Gestational age	Main diagnosis	Clinical signs	Diagnostic tools	Management	Pregnancy outcome
1	29 weeks	Juxtarenal + infrarenal AAA, impending rupture	Hypotension, pulsatile mass, lumbar pain	Ultrasound, CT angiography	Emergency endovascular repair	Cesarean at 37 weeks, healthy newborn
2	10 weeks	Sigmoid volvulus	Distension, pain, constipation	Radiography, CT scan	Laparotomy, sigmoidectomy, colostomy	Term vaginal delivery, healthy newborn
3	34 weeks	Infected Bartholin's cyst with para-rectal extension risk	Vulvar swelling, fever, purulent discharge	Clinical exam, bacteriology	Incision-drainage + antibiotics	Term vaginal delivery, healthy newborn
4	12 weeks	Adnexal torsion on ovarian cyst + fundic myoma	Acute pelvic pain, peritoneal irritation, adnexal mass	Ultrasound, laparoscopy	Detorsion, myomectomy	Term vaginal delivery; neonatal adrenal neuroblastoma

4. Discussion

Acute surgical emergencies in pregnancy remain rare but high-risk events. The four cases presented illustrate the spectrum: vascular catastrophe, bowel obstruction, pelvic infection, and adnexal torsion.

Abdominal aortic aneurysm (AAA): uncommon but catastrophic. Maternal mortality after rupture >50%, fetal mortality >70% [1]-[5]. Endovascular repair, though technically challenging in pregnancy, may offer reduced perioperative risks compared to open surgery.

Sigmoid volvulus: responsible for up to 44% of intestinal obstructions in pregnancy [6]-[9]. Risk factors: dolichocolon, high-fiber diet, chronic constipation. Imaging (CT/ultrasound) is essential despite pregnancy concerns. Endoscopic detorsion is first-line if no peritonitis; surgery mandatory if unsuccessful [10].

Bartholin's abscess: relatively common gynecologic pathology but rarely reported in pregnancy [11]-[13]. In pregnancy, the risk of local extension, hemorrhage, and preterm labor increases. Prompt drainage and safe antibiotic selection are essential. Pathogens include *E. coli*, anaerobes, and occasionally *Chlamydia trachomatis*.

Adnexal torsion: rare but mimics ectopic pregnancy. Delay can lead to adnexal necrosis and pregnancy loss. Conservative detorsion is preferable when feasible. In our case, management preserved both adnexa and pregnancy, but fetal outcome was complicated by an adrenal neuroblastoma, an incidental but clinically signif-

icant association.

Surgery and anesthesia risks in pregnancy: non-obstetric surgery carries risks of miscarriage, preterm labor, teratogenic drug exposure, and intrauterine hypoxia. Multidisciplinary planning with obstetric anesthesiologists and neonatologists is mandatory. Regional anesthesia may be preferred where feasible; general anesthesia requires optimized maternal oxygenation and hemodynamic stability.

These cases highlight the need for early imaging, rapid diagnosis, and individualized therapy, balancing maternal stabilization with fetal preservation.

1. Maternal-Fetal Risk Profile and Benefit-Risk Balance.

General perioperative principles in pregnancy:

Non-obstetric surgical disease threatens the fetus primarily through maternal hypoxia, hypotension, acidosis, fever, sepsis, and delayed source control rather than through anesthetic agents *per se*. Contemporary inhalational and intravenous anesthetics are not proven teratogens in clinical concentrations, and urgent surgery should not be delayed because of pregnancy or trimester when maternal benefit is clear [15] [16]. Per ACOG/ASA guidance, priorities include: rapid resuscitation; left uterine displacement beyond ~20 weeks to reduce aortocaval compression; avoidance of maternal hypoxemia and hypotension; normocapnia (avoid prolonged hyperventilation); venous thromboembolism prophylaxis as indicated; and fetal assessment (viable fetus: pre-/post-procedure monitoring and intraoperative monitoring when it can change management) [15] [16].

2. Imaging and contrast safety.

Diagnostic delay worsens outcomes; therefore, clinically indicated imaging should proceed. Fetal risk from ionizing radiation is negligible below ~50 mGy; typical single-study doses for abdominal CT are below this threshold, and shielding/low-dose protocols further reduce exposure [17] [18]. MRI (without gadolinium) is preferred when it can answer the question; gadolinium crosses the placenta and should be avoided unless the diagnostic benefit is expected to outweigh potential (low but uncertain) fetal risk [18]. Iodinated contrast crosses the placenta but has no demonstrated teratogenicity; neonatal thyroid function can be checked if large doses are used late in gestation [18]. The benefit-risk calculus thus favors timely, definitive imaging to expedite life-saving care.

3. Analgesia, antibiotics, and adjuncts.

Short courses of opioids are acceptable when needed; avoid NSAIDs after ~20 - 28 weeks because of fetal renal dysfunction/ductus arteriosus effects [19]. For antibiotics, β -lactams and metronidazole are acceptable choices; avoid tetracyclines and fluoroquinolones when alternatives exist [12] [15] [18]. Antenatal corticosteroids may be considered if preterm delivery risk is substantial, and tocolysis is individualized—never at the expense of delaying needed surgical control [15] [16].

4. Condition-specific risks and management trade-offs

1) Abdominal aortic aneurysm (AAA) with impending rupture.

Pregnancy's hormonal/hemodynamic milieu can accelerate aneurysm expan-

sion and precipitate rupture. Reported maternal mortality exceeds 50% and fetal loss > 70% with rupture [3]-[5]. The immediate risk profile is dominated by exsanguination, DIC, and fetal hypoxia. Endovascular repair (EVAR) during pregnancy has growing support for suitable anatomy because it reduces blood loss and physiologic stress versus open repair, with careful fetal shielding and continuous maternal-fetal monitoring [5] [15] [18]. The benefit-risk balance overwhelmingly favors urgent repair once rupture or impending rupture is suspected; deferral is rarely defensible given catastrophic maternal-fetal risk.

2) Sigmoid volvulus.

Sigmoid volvulus accounts for up to ~44% of intestinal obstructions in pregnancy in published series, with risk rising as the uterus enlarges [6]-[8]. Diagnostic delay increases maternal mortality (5% - 25%) and fetal loss (up to ~50%), particularly once ischemia/perforation occurs [9] [10]. In stable, non-peritonitic patients, urgent endoscopic detorsion is appropriate as first-line temporizing therapy, followed by early definitive management to prevent recurrence; failure, recurrence, or signs of ischemia mandate expedited surgery [7] [10] [20]. Imaging (radiography/CT or MRI) should not be withheld when it will change management; the fetal radiation dose is typically well below harmful thresholds and the maternal benefit of prompt diagnosis dominates [17] [18]. Intraoperative measures (left tilt, oxygenation, hemodynamic targets) mitigate fetal risk [15] [16].

3) Infected Bartholin's gland cyst/abscess with para-rectal extension risk.

Although often benign, pregnancy can be associated with faster progression, cellulitis, bacteremia, and preterm labor if source control is delayed. Microbiology is typically polymicrobial with Enterobacterales (e.g., *E. coli*) and anaerobes predominating; STIs (e.g., *N. gonorrhoeae*, *C. trachomatis*) may coexist and should be screened/treated when clinically suspected [11] [12]. The principal trade-off is timing of drainage versus theoretical procedure-related uterine irritability: prompt incision/drainage (or word catheter/marsupialization when appropriate) plus pregnancy-compatible antibiotics is the standard, with obstetric monitoring when late-gestation irritability is a concern [11] [12] [15] [16]. Here, the benefits of early source control clearly outweigh the small procedural/anesthetic risks.

4) Adnexal torsion mimicking ruptured ectopic pregnancy.

Adnexal torsion presents with acute unilateral pelvic pain, peritoneal signs, and ultrasound uncertainty, often leading to concern for ectopic pregnancy. Delayed detorsion risks ovarian necrosis, sepsis, and pregnancy loss; conversely, early laparoscopy/laparotomy allows detorsion and organ-preserving management—even in early pregnancy—with favorable obstetric outcomes in most series [15] [16]. When concurrent pathology (e.g., pedunculated subserosal fibroid) contributes to pain or exposure, conservative myomectomy may be justified in selected cases with experienced teams and meticulous hemostasis. The dominant risk is delayed intervention, not anesthesia; thus the benefit-risk balance supports urgent surgical exploration when torsion is likely.

5. Practical synthesis for benefit-risk decision-making.

1) Treat the mother first. Maternal stabilization and source control are the most effective fetal interventions.

2) Do not delay indicated imaging or surgery. Use the safest adequate modality; doses in modern protocols are well below teratogenic thresholds [17] [18].

3) Customize anesthesia and perioperative care to pregnancy physiology (airway, aspiration risk, aortocaval compression), and coordinate with obstetrics for monitoring and delivery-contingency planning when gestational age is viable [15] [16].

4) Choose pregnancy-compatible antibiotics/analgesics, avoid NSAIDs after ~20 weeks, and employ VTE prophylaxis and infection control measures [12] [15] [16] [19].

5) Multidisciplinary planning (surgery, anesthesiology, obstetrics, neonatology, radiology) improves timing and sequencing of interventions and neonatal readiness when needed.

5. Conclusions

Acute surgical emergencies during pregnancy, though rare, are potentially life-threatening for both mother and fetus.

- 1) Early suspicion and timely imaging are critical despite gestational concerns.
- 2) Management must be multidisciplinary, tailored to maternal and fetal needs.
- 3) Awareness and preparedness are especially important in resource-limited settings.

By documenting these diverse cases, we aim to contribute to better understanding and management of surgical emergencies in pregnancy, improving maternal-fetal prognosis.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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