Uterine Rupture During Induction of Labor for Second Trimester Fetal Demise

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Background

- **Intrauterine fetal demise (IUFD)** occurs in **1/160 pregnancies**.[1]
- The most common **risk factors for IUFD** include:
  - Non-Hispanic black race
  - Nulliparity
  - Advanced maternal age
  - Obesity
  - Pre-existing diabetes
  - Chronic hypertension
  - Smoking, alcohol use
  - Pregnancy using assisted reproductive technology
  - Multiple gestations
  - Male fetal sex
  - Unmarried status
  - Past obstetric history including previous stillbirth[1]
- Data is mixed regarding previous cesarean sections as a risk factor for IUFD.
- **Management of IUFD** in the setting of **multiple prior cesarean deliveries (CD)** can present a challenge due to limited data on outcomes.
- Both induction of labor (IOL) and surgical evacuation are options for women with IUFD and a history of previous CD.
- Before 28 weeks gestation, vaginal misoprostol is the **most efficient method** of induction for IUFD.[1] However, from 13-24 weeks gestation, **IOL is less effective**, with **higher maternal morbidity** compared to surgical evacuation.[1]
- Previous hysterotomy is the **most common risk factor** for **uterine rupture (UR);** rate of UR in women with a prior cesarean section is ~0.5% and increases with number of cesarean sections.[2-4]

1. Metz TD et al. Management of Stillbirth: Obstetric Care Consensus. American College of Obstetricians and Gynecologists and Society for Maternal-Fetal-Medicine. March 2020; 10.
2. Berghella V et al. (2009) Misoprostol for second trimester pregnancy termination in women with prior caesarean: a systematic review. BJOG: An International Journal of Obstetrics & Gynaecology 116: 1151-1157.
3. Motomura K et al. Incidence and outcomes of uterine rupture among women with prior caesarean section: WHO Multicountry Survey on Maternal and Newborn Health. Sci Rep. 2017 Mar 10;7:44093. PMID: 28281576.
4. Al-Obaidi AD, Hashim AS, et al. Spontaneous mid-trimester uterine rupture associated with fetal death in a young patient during COVID-19 pandemic: A case report. Clin Case Rep. Dec 2022, 27;10(12):e6802. doi: 10.1002/ccr3.6802. PMID: 36590664. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9794919/

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Clinical Case Description

- A 37-year-old **G6P4A1** at **18 weeks** gestation with ***4 prior CDs*** presented with vaginal bleeding and preterm labor with positive fetal movement and fetal heart tones (FHT) of 90 BPM.
- **Labor CSE** for analgesia, several hours later **IUFD** was confirmed.
- IOL was initiated and she received **six doses** of vaginal misoprostol
- On hospital day 2, she became ***tachycardic*** with ***mild RLQ pain***. **Hemoglobin was 5.1 g/dL**. Bedside US was concerning for UR and she was taken for **emergent exploratory laparotomy**.
- She underwent general anesthesia with endotracheal intubation. **UR was confirmed** along the **previous hysterotomy incision** of the lower uterine segment with bilateral lateral extensions.
- A hysterectomy was performed maintaining integrity of the amniotic sac.
- She received 4 units pRBCs, 2 units FFP, and 2200 mL LR. Post-transfusion ROTEM and coagulation studies did not indicate need for additional transfusion and hemoglobin improved to 11.2 g/dL. She required minimal pressor support.
- She was extubated with epidural in place for post-op pain control.

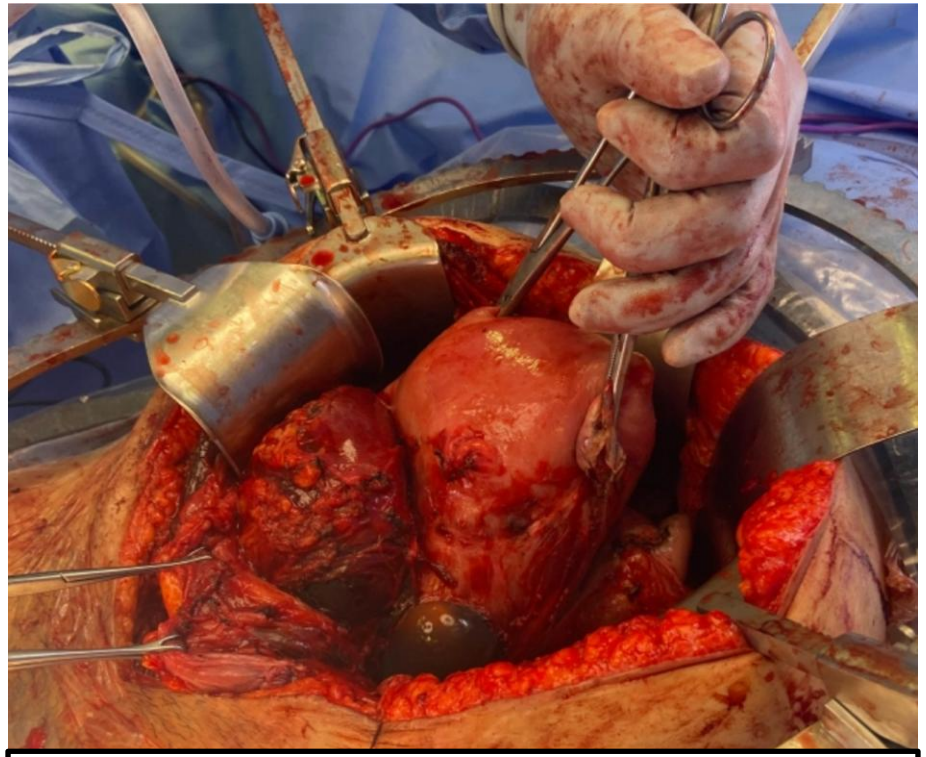

Figure 1. Intra-operative photograph of the patient's uterine rupture along her previous hysterotomy incision. A herniated, intact amniotic sac containing fetal materials is present at the 9 o'clock position.

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Learning Points

- Patient's **risk factors for IUFD** included:
  - Advanced maternal age
  - Previous stillbirth
  - 4 prior pregnancies
- The patient received the **recommended doses** of misoprostol for **IUFD prior to 28 weeks**.[1]
- Her previous CDs were an independent **risk factor for UR**.[2-4] Per ACOG recommendations for IUFD management, **surgical intervention** is a reasonable option for patients at increased risk of UR
- **Classic signs of UR**:
  - Non-reassuring FHTs
  - Acute onset abdominal pain
  - Vaginal bleeding
  - Change in contraction pattern[5]
- In this case, FHTs were not being monitored after IUFD was identified.
- The patient did not initially show obvious signs of UR but **IOL was not progressing** despite six doses of misoprostol over 18 hours. She did have **mild breakthrough pain** with an epidural in place.
- **UR at 18 weeks is uncommon**; 80% of ruptures occur at 28-36 weeks.[4]
- There is limited data for IOL for IUFD in women with prior CD before 24 weeks, second trimester UR, and rupture secondary to induction for IUFD.
- There is a reported **40 times increased risk** of **poor maternal outcomes** after uterine rupture. Therefore, ***vigilance for rupture*** should remain high during IOL in those at an increased risk of UR.[3]

1. Metz TD et al. Management of Stillbirth: Obstetric Care Consensus. American College of Obstetricians and Gynecologists and Society for Maternal-Fetal-Medicine. March 2020; 10.
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5. Togioka BM et al. Uterine Rupture. [Updated 2023 Jul 29]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 Jan-. https://www.ncbi.nlm.nih.gov/books/NBK559209/