

Uterine Rupture in a Patient with an Unscarred Uterus: A Case Study

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ABSTRACT

Uterine rupture is a true obstetrical emergency. We present a case of a multigravid woman who had a spontaneous uterine rupture after induction with misoprostol and oxytocin, followed by a general discussion of uterine ruptures with a special emphasis on an unscarred uterus. Risk factors for uterine rupture in an unscarred uterus include grand multiparity, induction with misoprostol or oxytocin, malpresentation, or previous surgical abortion. Most cases present with maternal tachycardia, signs of fetal distress, and bleeding. The treatment for intrapartum uterine rupture includes fluid resuscitation and emergency laparotomy. Postpartum counseling regarding the risk of rerupture with subsequent pregnancies is an important piece of the management of these patients.

INTRODUCTION

Uterine ruptures are a true obstetric emergency. Physicians performing vaginal deliveries must be on guard for the signs and symptoms suggestive of rupture. Treatment is with emergency laparotomy. Therefore, knowing the risk factors and acting decisively can often save the lives of both mother and child in these emergent situations.

CASE

A 22-year-old woman (Gravida 3 Para 2,0,0,2) was scheduled for post-dates induction of labor at 41-and-a-half weeks. Her prenatal course had been unremarkable, and past pregnancy history included 2 uncomplicated spontaneous vaginal deliveries. On arrival to the labor and delivery floor, cervical dilatation was 1 cm.

At approximately 8:15 PM on the evening of induction, 25 mcg of misoprostol was placed intravaginally. Around

midnight, the patient was experiencing regular uterine contractions, so no further misoprostol was given. At 4:30 AM, contractions became more irregular and IV pitocin was started at 1 m μ /min and increased to 6 m μ /min over the next 90 minutes. At this point uterine contractions were every 2-5 minutes and lasted 60 seconds.

At 6:35 AM, her cervix was 5 cm dilated, and she was experiencing very painful uterine contractions, primarily in the anterior abdomen and rectum. Within minutes, the fetal heart tones went from a rate of 120 to bradycardic at 70. A repeat vaginal exam found gross blood. Membranes were ruptured and a fetal scalp electrode placed, confirming the fetal bradycardia. The patient was immediately transferred to the operating room at approximately 6:50 AM for an emergency cesarean section, during which a larger posterio-lateral tear was found from the mid-uterine fundus all the way through the vaginal wall. A boy was delivered at 7:09 AM. APGAR scores were 0, 6, and 9 at 1, 5, and 10 minutes respectively. The cord pH was 6.88. The tear in the uterus was repaired without difficulty. After the surgery the mother's hemoglobin was noted to be 6.7 and she received 4 units of blood; 3 days later her hemoglobin was stable at 11.6. Both mother and baby appeared healthy upon discharge.

DISCUSSION

With a 5% maternal mortality rate and a 61% infant mortality rate,¹ prompt effective management of uterine ruptures is necessary to save lives. Though the overall incidence of uterine rupture is 0.05%,² this incidence increases significantly in women with a prior cesarean delivery. In a recent study by Lydon-Rochelle,³ the incidence ranged from 0.1% for those with a repeated cesarean delivery to 2.4% for those with a trial of labor with induction by prostaglandins (see Table 1). In an unscarred uterus, the incidence of spontaneous rupture ranges from 1 in 8000 to 1 in 1500.⁴⁻⁶

RISK FACTORS

Risk factors for uterine rupture are listed in Table 2.

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Table 1. Incidence and Relative Risk of Uterine Rupture During a Second Delivery Among Women with a Prior Cesarean Delivery³

Type of Delivery	No. of Women	Incidence per 1000	Relative Risk
Repeated cesarean delivery without labor	6980	1.6	1.0
Spontaneous onset of labor	10,789	5.2	3.3 (1.8-6.0)
Induction of labor without prostaglandins	1960	7.7	4.9 (2.4-9.7)
Induction of labor with prostaglandins	366	24.5	15.6 (8.1-30.0)

Previous uterine surgery is the most common risk, and cesarean section is the surgery most frequently associated with uterine rupture. Both multiple previous cesarean sections and the presence of a classical uterine scar carry increased risk. Whether prior vaginal deliveries increase or decrease the risk of rupture is not known.⁷

Induction and augmentation with pitocin are associated with serious adverse events, including uterine rupture. Lydon-Rochelle³ found that the incidence of rupture when pitocin was used during a vaginal birth after cesarean (VBAC) was 7.7 per 1000. Although rupture without previous uterine surgery is rare, studies by Miller and Paul⁸ and Sweeten⁶ reported 2 cases each. Another factor that has commonly been associated with increased risk of uterine rupture is grand-multiparity. One study showed risk of rupture increased 20-fold in patients with 7 or more previous deliveries.⁹ However, Ben-Aroya¹⁰ found no significant difference in the rate of uterine rupture in patients with 4 or more pregnancies who received pitocin augmentation.

Prostaglandins used for cervical ripening and induction of labor have been associated with increased risk of rupture when used in patients with previous cesarean sections.^{3,7} Misoprostol has been of particular interest but is not currently approved by the Federal Drug Administration for induction of labor. An American College of Obstetrics and Gynecology Committee Opinion (No. 248, December 2000) currently supports the use of 25 mcg misoprostol, not to be used more frequently than every 3-6 hours, not to be used with pitocin unless time elapsed since the last dose is >4 hours, and not to be used in patients with previous cesarean section or major uterine surgery.¹¹ Reported cases of uterine rupture with misoprostol in the unscarred uterus include those presented by Akhan¹² and Khabbaz,¹³ but no studies estimate the overall risk. Any form of induction should be practiced with extreme caution, and patients should be monitored very closely for adverse events.

Anything that stretches the uterus and weakens the muscles can increase the risk of uterine rupture. This includes forced amnioinfusion, multiple gestation, hydrocephaly, forced manipulation of the birth canal and

uterus such as mechanical cervical dilatation or breech extraction, or instrumental delivery. Uterine ruptures are associated with malpresentation and the use of forceps or vacuum extraction.¹⁴ The presence of congenital uterine anomalies such as rudimentary horns can also lead to increased risk.⁹

Finally, any external trauma can increase risk. Blunt trauma due to direct force leads to uterine rupture about 0.6% of the time. In these cases, fetal death is nearly 100%, and maternal death is approximately 10%.¹⁴

Signs and Symptoms of Uterine Rupture

Classically, it was thought that fetal bradycardia and a loss of contractions was pathognomonic for a uterine rupture. However, a recent study where an intrauterine pressure catheter was in place showed that hyperstimulation or a normal contraction pattern was seen in all 39 recorded cases of uterine ruptures.^{6,15} The literature reports that the most common findings are that of maternal tachycardia and severe fetal heart rate decelerations, with the latter being present in 80% of cases reported by Rodriguez.¹⁵ A common scenario is initial presentation of maternal tachycardia, sudden fetal distress followed by vaginal bleeding, and abdominal pain or a sensation reported by the mother that something is ripping.⁶

In some cases the patient presents initially with significant pain and abdominal tenderness. With a concealed bleed, a rupture may only become apparent when the mother becomes severely hypovolemic and fetal distress becomes apparent. At times, it is possible to actually detect the fetal parts in the abdomen, a contracted uterus nearby, and a loss of fetal station. A careful examiner may actually appreciate the ruptured tissue.¹⁶

The diagnosis is primarily a clinical one, confirmed with laparotomy. In more subtle cases, an ultrasound may be useful to aid in making the diagnosis. However, any time risk factors are present, a physician should remain vigilant regarding the possibility of a uterine rupture. A differential diagnosis is listed in Table 3.

Treatment

The above signs and symptoms should quickly mobilize the physician to perform emergency laparotomy followed by cesarean delivery with the goal of saving both mother

Table 2. Risk Factors for Spontaneous Uterine Rupture in Unscarred Uterus

Grand multiparity
Undiagnosed fetopelvic disproportion or malpresentation
Oxytocin stimulation
Prostaglandin induction
Macrosomic-hydrocephalic fetus
Placenta previa/percreta, prior invasive mole
Prior instrumental abortion
External cephalic version
Uterine anomalies
Malpresentation
Obstetric trauma
Internal podalic inversion
Amnioinfusion
Any overdistension

Table 3. Differential Diagnosis of Uterine Rupture

Uterine abruption
Placenta previa
Vasa previa
Uterine inversion
Cervical tear
Vaginal tear
Coagulopathy
Uterine atony
Uterine artery rupture

and child. At the same time, fluid resuscitation and hemostasis must be emphasized. Rapid infusion of crystalloid through large bore needles followed by whole blood transfusion is important with a significant rupture. Hemostasis can be attempted by such means as aortic compression; oxytocin administration; and ligation of the hypogastric, uterine, or ovarian arteries.⁹ The decision as to whether a hysterectomy is necessary or whether the uterus can be repaired and saved is made intraoperatively, based on stability of the mother, extent of damage to the uterus, and whether the mother desires to have additional children.

Counseling after a Uterine Rupture

Though hysterectomy was initially thought to be the best treatment for uterine rupture, most physicians now try to repair the uterus, if possible. The risk of rerupture seems to range from 4%-19%.^{9,17,18} Therefore, patients need to be counseled regarding the high risk of rerupture, the option of sterilization, and, given the site and extent of damage, whether scheduled c-section is an option for delivering babies in the future.

SUMMARY

Uterine rupture in an unscarred uterus is a relatively rare

phenomenon. In our patient the use of misoprostol and oxytocin, though indicated, probably contributed to the rupture of her uterus. Physicians need to be ever watchful for the signs and symptoms of uterine rupture as treatment needs to be swift and aggressive. Counseling patients regarding their risk of uterine rupture both with the use of induction agents and in all patients with previous uterine procedures is essential. With prompt diagnosis and treatment, the complications from uterine rupture can be greatly minimized.

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