Journal of Clinical Obstetrics, Gynecology & Infertility

Case Report
Published: 08 Mar, 2018

Rupture of an Unscarred Uterus in a Woman with Recurrent Prior Uterine Instrumentation

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Abstract

Background: Uterine rupture is an obstetric emergency with potential for catastrophic maternal and fetal outcomes. Uterine instrumentation has not been commonly thought to be associated with uterine rupture.

Case Presentation: A 31 year old, gravida 21, para 3, 0, 17, 3 underwent induction of labor at 40 6/7 weeks. She had no prior cesarean deliveries, two prior spontaneous abortions, and fifteen prior surgical terminations of pregnancy in the first trimester. Her active phase of labor was complicated by deterioration of the fetal heart tracing. She underwent vacuum assisted vaginal delivery followed by a postpartum hemorrhage. Bimanual examination revealed a lower uterine segment defect with palpable intra-abdominal contents. She underwent exploratory laparotomy and supracervical hysterectomy.

Conclusion: A high index of suspicion and early diagnosis are paramount to the management of uterine rupture. Uterine rupture should be considered in patients with a history of uterine instrumentations.

Introduction

Uterine rupture is an obstetric emergency with potential for devastating maternal and fetal outcomes. This condition has been most commonly associated with prior uterine surgery; however it is reported in patients with an unscarred uterus as well. Uterine rupture in an unscarred uterus has been associated with prostaglandin use, oxytocin administration, instrumented delivery, obstructed labor, multiple gestation, and connective tissue disorders. We searched the literature under the terms "uterine rupture," "unscarred uterine rupture," "unscarred uterus," and "unscarred rupture." Until now, uterine rupture has not been reported in a patient with a history of multiple uterine instrumentations [1,2].

Case Presentation

A 31 year old Hispanic gravida 21, para 3, 0, 17, 3, presented to our labor and delivery unit at 40 6/7 weeks gestation, for scheduled induction of labor. Her history was significant for three prior uncomplicated vaginal deliveries without retained placenta or need for uterine instrumentation, two first trimester spontaneous abortions, fifteen prior first trimester surgical terminations of pregnancy, late entry to care, Group B *Streptococcus* (GBS) colonization, desire for postpartum sterilization, and social disarray including eviction, homelessness, poor social support, and ongoing spousal incarceration.

None of her first trimester abortions were performed at our institution, and operative reports and pathology reports were not available at the time of her labor and delivery. The patient denied any complications of the procedures, including perforation, hemorrhage, or need for laparoscopy. All procedures were reported to be ambulatory with same-day discharge and uncomplicated post-operative courses.

At the time of admission her vital signs were normal, and the estimated fetal weight by Leopold maneuvers was consistent with a sonogram estimate of 3706 g one week prior to admission. Fetal heart tracing was initially 170 beats per minute at baseline with moderate variability, absent accelerations, and absent decelerations. With hydration the baseline returned to the normal range and accelerations were present. Her cervical exam revealed a bishop score of zero.

Cervical ripening was begun with a dinoprostone 10 mg vaginal insert. Twelve hours later the dinoprostone insert was removed. A cervical exam was deferred based on patient request,

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Received Date: *23 Feb 2018*
Accepted Date: *05 Mar 2018*
Published Date: *08 Mar 2018*

Citation:
Kuba K, Matseoane-Peterssen DN, Goffman D. Rupture of an Unscarred Uterus in a Woman with Recurrent Prior Uterine Instrumentation. J Clin Obstet Gynecol Infertil. 2018; 2(1): 1030.

penicillin was started for GBS prophylaxis and oxytocin was initiated via low-dose oxytocin protocol. Cervical exam after sixteen hours of oxytocin was 2 cm / 50% / -3 / posterior position / medium consistency. Artificial rupture of membranes was performed at this time revealing clear amniotic fluid. After nineteen hours of oxytocin, the infusion had reached 18 mu/min and was stopped for a single prolonged fetal heart rate deceleration, with prompt recovery to category one. Shortly thereafter, the patients contractions were every 5 minutes, and oxytocin infusion was re-started at 1mu/min and titrated again using low-dose protocol. After twenty-three hours of oxytocin induction, and seven hours after membrane rupture, the patient had a temperature of 100.5 F and her cervical exam was 8 cm / 100% / -1 / anterior position / soft consistency. Acetaminophen was administered, antibiotic coverage was broadened for presumed chorioamnionitis, and oxytocin was continued. One hour later she was found to be 9 cm dilated with recurrent variable decelerations. An intrauterine pressure catheter was placed posteriorly without difficulty demonstrating a normal appearing baseline pressure and contraction pattern, with a frequency of every 2-3 minutes. Amnioinfusion was initiated per institutional protocol and subsequently stopped when variable decelerations resolved. A total of 384 mL of normal saline was infused. One hour after her previous exam, the patient developed recurrent late decelerations progressing to recurrent prolonged decelerations. At this time, oxytocin infusion was at 5 mu/min, her contractions were every 2 minutes and adequate by Montevideo units. She was found to be 10 cm / 100% / +2 station, with the fetus in left occiput anterior position, and underwent uncomplicated vacuum-assisted vaginal delivery for category two fetal heart tracing. Neonatal birth weight was 4,090 g with APGAR scores 6 and 9 at 1 and 5 minutes, respectively. The arterial cord pH was 7.11 with a base excess of -5.8. The infant was admitted to the neonatal intensive care unit for respiratory distress and ultimately discharged on day of life three.

Delivery of the infant was followed by a small amount of blood clot. The placenta was delivered three minutes after the infant with active management of the third stage of labor. There was mild uterine atony which improved with 30 units intravenous oxytocin given per institutional protocol, as well as methylergonovine 0.2 mg intramuscular and misoprostol 1000 mcg given rectally. The patient continued to have episodic bright red vaginal bleeding. The placenta was inspected and noted to be intact without retroplacental clot. There were no perineal or vaginal lacerations, and the cervix was inspected and noted to be intact circumferentially. A bedside transabdominal sonogram was performed and the uterine cavity was manually explored. There was no evidence of retained membranes or placental tissue. However, on intrauterine examination, a defect was noted in the left lower uterine segment, through which bowel was palpated. Transabdominal sonogram confirmed a 7.2 cm heterogeneous collection in the left pelvis. Diagnosis of uterine rupture was made.

The patient promptly underwent exploratory laparotomy which revealed hemoperitoneum, a six centimeter vertical defect in the left lower uterine segment extending to the superior aspect of the cervix, lacerated left uterine vessels, and a left broad ligament hematoma. Given the lacerated uterine vessels and broad ligament hematoma, the decision was made for hysterectomy as opposed to primary repair. Supracervical hysterectomy was performed without further complication. Total estimated blood loss was approximately 1,500 mL and the patient received 2 units of red blood cells. She was continued on intravenous antibiotics for forty-eight hours post operatively. Her recovery was otherwise uncomplicated, and she was discharged on post-operative day three. She was seen for follow up as an outpatient twice and her post-partum course was medically uncomplicated.

Discussion

Uterine rupture is an obstetric emergency with potential for devastating maternal and fetal consequences. The overall incidence of uterine rupture has been described as between 0.03% - 0.08% [1-3]. The presence of prior transmural uterine scar is the most significant risk factor for uterine rupture [2]. The risk of rupture increases significantly in patients with a prior cesarean delivery, but is as low as 0.006% in patients without a prior cesarean [3]. Other risk factors for uterine rupture already described include grand multiparity, prostaglandin use, oxytocin use, induction of labor, labor dystocia, macrosomia, multiple gestation, and connective tissue disorders [1,4-7]. Although uterine rupture is thought to be more likely later in gestation with greater uterine distension, Mannini et al. [8] described a case of uterine rupture diagnosed as early as 15 weeks. Their patient had one prior dilation and curettage, but uterine instrumentation itself was not thought to be a risk factor [8].

Clinical signs and symptoms of uterine rupture include changes in the fetal heart tracing, abdominal pain, vaginal bleeding and loss of fetal station. Patients may show changes in vital signs including tachycardia, hypotension or tachypnea, though diagnosis in labor is difficult as patients may experience many of these signs and symptoms in labor and after receiving neuraxial analgesia. In patients undergoing labor after cesarean, a high index of suspicion is maintained and changes in clinical status must be carefully scrutinized to establish or exclude the diagnosis of uterine rupture and prevent maternal and fetal morbidity. In patients with an unscarred uterus, the same level of scrutiny is often not applied. A high index of suspicion allows for prompt diagnosis and mobilization of resources for safe management. The management of suspected intrapartum uterine rupture is laparotomy with cesarean delivery, followed by assessment and control of impending hemorrhage, either by uterine repair or hysterectomy. In cases such as this, when diagnosed immediately postpartum, management should remain surgical exploration and hemorrhage management. The decision for uterine repair versus hysterectomy is specific to each patient's unique clinical scenario, anatomy, surgical and perioperative complications, and desire for future childbearing. In this case, high index of suspicion and prompt laparotomy allowed avoidance of coagulopathy, ICU admission, and prolonged hospitalization while minimizing blood product transfusion.

Her known risk factors included multiparity, induction of labor, macrosomia, use of prostaglandin, use of oxytocin, and operative delivery. We acknowledge that use of dinoprostone and an oxytocin infusion rate up to 18 mu/min is not trivial. Catanzarite et al. [9] reported a case in which they associated uterine rupture with oxytocin infusion up to 17 mu/min. However in their case, the oxytocin infusion was serially increased despite a contraction frequency of every 1-3 minutes, and without an intrauterine pressure catheter to assess adequacy, resulting in tachysystole. The authors concluded that "excessive uterine activity" resulted in their patients' uterine rupture [9]. In our patient's case, her labor progressed normally after reduction of her oxytocin infusion rate, suggesting an intact uterus. Moreover, an intrauterine pressure catheter placed during active labor showed a normal baseline pressure and contraction frequency. During her labor course she also had no vaginal bleeding or changes

in vital signs, and there was never loss of fetal station. Therefore we believe it is unlikely that the uterine rupture occurred during the first stage of labor. Our suspicion rose once the patient began to have recurrent fetal heart rate decelerations. In retrospect, we believe this patients' uterus ruptured during the second stage of labor, resulting in intra-abdominal hemorrhage, uteroplacental malperfusion, and the recurrent late and prolonged decelerations which necessitated the operative delivery. Increase in uterine distension secondary to amnioinfusion may have been contributory but has not yet been adequately studied as a risk factor for uterine rupture. The patient has no known history of connective tissue disorders, but has never undergone formal evaluation.

Unscarred uterine rupture is becoming more commonly reported in the literature, though notably, less so by American authors. Vernekar et al. [10] in 2016 published a review of unscarred uterine rupture at a single center in India over a two year period. With thirteen cases, they found that the greatest risk factors were labor mismanagement, followed by oxytocin use, obstructed labor, operative delivery, and use of prostaglandin gel. Labor mismanagement was not defined in their review. We believe that our patients' uterine rupture occurred in the second stage while oxytocin was at low dose (5 mu/min), with a normal contraction pattern, prior to performing the operative delivery, and that her overall labor course was unobstructed and labor management was appropriate. While scarred uterine ruptures are more likely to be asymptomatic and discovered incidentally at time of cesarean, stillbirth and maternal and neonatal death is more likely to occur in patients with unscarred uterine rupture, with maternal and fetal mortality up to 16% and 83%, respectively, albeit in low-resource settings [11].

A history of multiple uterine instrumentation procedures can present a biologically plausible risk for uterine rupture in future pregnancies. Possible mechanisms may be undiagnosed uterine perforation or repeated myometrial injury at the time of uterine instrumentation, thereby compromising myometrial integrity. In 2009, Dow et al. [12] conducted a review of uterine rupture without a prior cesarean, concluding that prior unrecognized uterine perforation, myomectomy, and thermal injury may be associated. The risk of diagnosed uterine perforation at time of first trimester abortion has been reported as ranging from <0.1% to 2.3% [13]. Although this patient had no known post-abortion complications, the risk of occult uterine perforation at time of instrumentation has not been well established and is therefore unknown in this patient.

This case report is limited as the patient did have several other known risk factors for uterine rupture, though the history of fifteen prior uterine instrumentations should not be overlooked given its biologic plausibility. A high index of suspicion should be maintained for patients with this history and clinical presentation consistent with uterine rupture. Caution should be considered at the time of induction of labor or operative vaginal delivery if performed in patients with a similar history. Future inquiry is needed to explore the possible association of uterine instrumentation procedures with uterine rupture in subsequent pregnancies.

With advances in minimally invasive gynecologic techniques and increased access to family planning services, uterine instrumentation is becoming more common. Coupled with rising maternal age, obesity, gestational diabetes and macrosomia in the United States, unscarred uterine rupture may become more prevalent over the coming years. More study is needed among US populations to better elucidate risk factors for, and evaluate the incidence of, this condition. Regardless, maintaining vigilance and a high index of suspicion should facilitate prompt diagnosis and mobilization of resources for safe management and help to mitigate the risk of adverse maternal and neonatal outcomes in the setting of uterine rupture.

References

1. Sinha M, Gupta R, Gupta P, Rani R, Kaur R, Singh R. Uterine Rupture: A Seven Year Review at a Tertiary Care Hospital in New Delhi, India. Indian J Community Med. 2016;41(1):45-9.
2. Landon MB1.Uterine rupture in primigravid women. Obstet Gynecol. 2006;108(3 Pt 2):709-10.
3. Hofmeyr GJ, Say L, Gulmezoglu AM. WHO Systematic Review of Maternal Mortality and Morbidity: The Prevalence of Uterine Rupture. BJOG. 2005;112(9) 1221-8.
4. Abdalla N, Reinholz-Jaskolska M, Bachanek M, Cendrowski K, Stanczak R, Sawicki W. Hemoperitoneum in a patient with spontaneous rupture of the posterior wall of an unscarred uterus in the second trimester of pregnancy. BMC Res Notes. 2015;8:603.
5. Tarney CM, Whitecar P, Sewell M, Grubish L, Hope E. Rupture of an unscarred uterus in a quadruplet pregnancy. Obstet Gynecol. 2013;121(2 Pt 2 Suppl 1):483-5.
6. Walsh CA, O'Sullivan RJ, Foley ME. Unexplained prelabor uterine rupture in a term primigravida. Obstet Gynecol. 2006;108(3 Pt 2):725-7.
7. Walsh CA, Reardon W, Foley ME. Comment on unexplained prelabor uterine rupture in a term primigravida. Obstet Gynecol. 2007;109(2 Pt 1):455.
8. Mannini L, Sorbi F, Ghizzoni V, Masini G, Fambrini M, Noci I. Spontaneous Unscarred Uterine Rupture at 15 Weeks of Pregnancy: A Case Report. Ochsner J. 2016;16(4):545-47.
9. Catanzarite V1, Cousins L, Dowling D, Daneshmand S. Oxytocin-associated rupture of an unscarred uterus in a primigravida. Obstet Gynecol. 2006;108(3 Pt 2):723-5.
10. Vernekar M, Rajib R. Unscarred Uterine Rupture: A Retrospective Analysis. J Obstet Gynaecol India. 2016;66(Suppl 1):51-4.
11. Batra K, Gaikwad HS, Gutgutia I, Prateek S, Bajaj B. Determinants of rupture of the unscarred uterus and the related feto-maternal outcome: current scenario in a low-income country. Trop Doct. 2016; 46(2):69-73.
12. Dow M, Wax JR, Pinette MG, Blacksone J, Cartin A. Third trimester uterinerupture without previous cesarean: a case series and review of the literature. Am J Perinatal. 2009;26(10):739–44.
13. White K, Carroll E, Grossman D. Complications from first-trimester aspiration abortion: a systematic review of the literature. Contraception. 2015; 92(5): 422-38.