Uterine-Vesicular Rupture During Trial Of Labor

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Uterine rupture during labor is recognized as a potentially serious complication in patients who have previously given birth by Cesarean section. Small tears in the uterine scar, usually diagnosed on manual examination of the lower segment of the uterus after vaginal delivery, are relatively common and heal without complications in most patients who successfully undergo trial of labor. True rupture of the uterus during trial of labor, though uncommon, is a serious risk for both the mother and the fetus.

The incidence of uterine rupture in the modern practice of obstetrics in the United States is low when compared with countries where access to obstetric care during labor is often delayed.[1] The primary cause of uterine rupture in our patients is the rupture of the scar from a previous low transverse Cesarean section. While minor bladder injury can occur with uterine rupture, actual bladder rupture and subsequent delivery through the bladder is rare. This case report describes an atypical case of uterovesicular rupture in a multiparous patient.

Case Report

A 34-year-old woman, gravida 6, para 5, abortus 0, who had a history of two vaginal deliveries followed by three uncomplicated low-transverse Cesarean sections, came to the hospital in labor after previously deciding on a trial of labor early in pregnancy. Her prenatal course had been unremarkable, and an obstetrician was consulted to help the patient decide whether to attempt a trial of labor. The patient was admitted to the labor and delivery unit and within minutes complained of a need to void. Her urine then was clear, but after voiding, and before any internal monitors were placed, she complained of a strong, painful contraction (Figure 1A). An abdominal examination at that time revealed a term gravid uterus with no tenderness, rebound, or guarding. The cervix was 90 percent effaced, at −3 station and 4 cm dilated. The patient was normotensive and was not tachycardic.

Internal monitors were placed immediately, and with artificial rupture of membranes, a trace of meconium with a trace of dark blood was noted. After 12 minutes variable decelerations began to appear with good beat-to-beat variability (Figure 1B). These decelerations were characterized by fetal heart rates dropping below 70 beats per minute and lasting 30 to 60 seconds. Amnioinfusion was initiated, but several contractions that occurred during the infusion appeared to cause late decelerations (Figure 1C). The severe variable decelerations recurred after completion of a 500-mL infusion of saline. A scalp pH was 7.32, but after two more contractions with severe variables, labor was halted with subcutaneous terbutaline, and the trial of labor was abandoned (Figures 1D and 1E). Severe variable decelerations and the low amplitude of the waveform with an elevated base-line pressure in the intrauterine pressure catheter were suggestive of uterine rupture. Still no signs of rupture were found on examination. A Foley catheter was placed, and gross blood flowed from the bladder, confirming our suspicions of uterine rupture. The patient was taken directly to the operating room. The fetus maintained a normal heart rate with cessation of contractions while the mother was prepared for surgery.

The abdomen was entered with a midline vertical incision over a previous scar. The anterior wall of the uterus appeared intact, but the peritoneal reflection over the bladder and the lower uterine segment was elevated and a violaceous color. This reflected area was elevated off the uterus in an attempt to separate the bladder from the uterine wall. When it was opened, it was clear that the uterus had ruptured into the bladder and the force had also opened the dome of the bladder (Figure 2). The dense scar tissue from the previous surgeries had encased the ruptured area of the uterine and bladder walls. The fetus's head was

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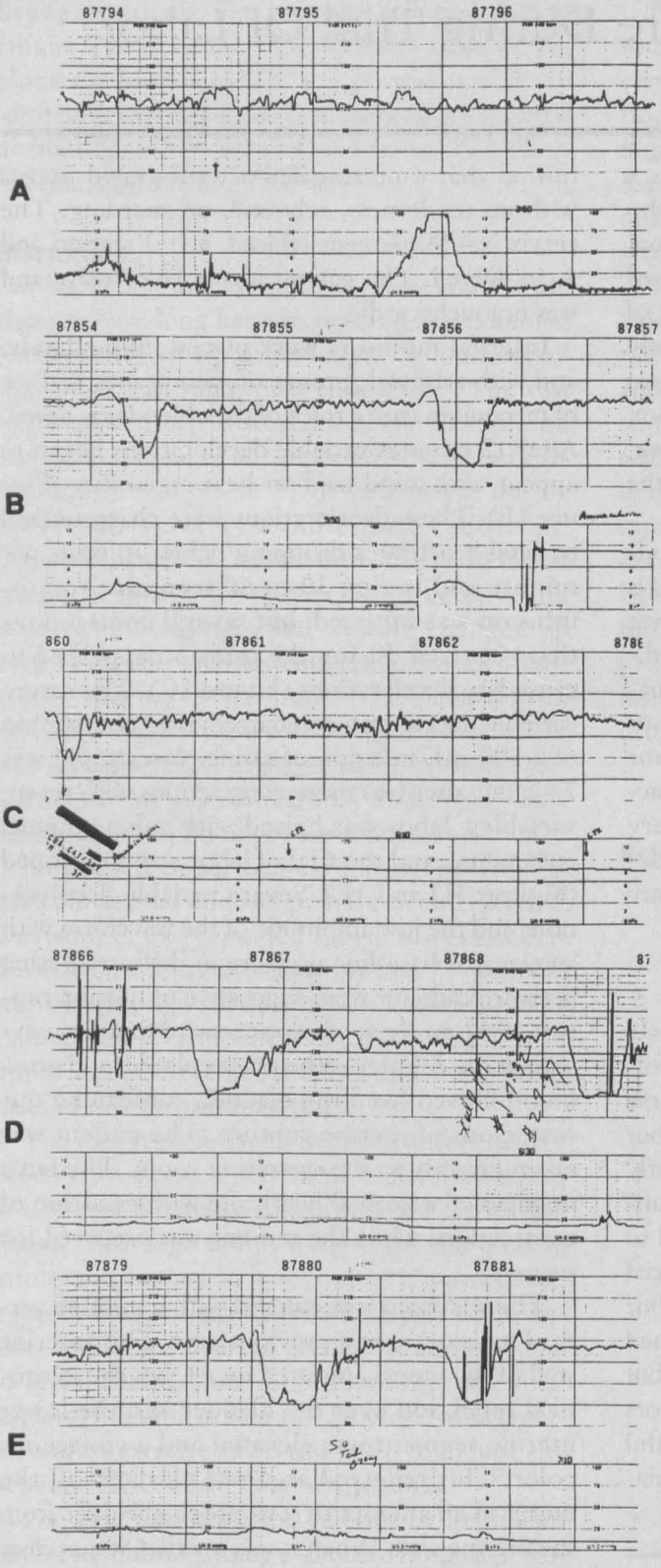

Figure 1. Fetal heart tracing and intrauterine pressure catheter readings during labor.

partially extruded into the bladder. The trigone of the bladder was intact as were the ureteral openings.

A vertical uterine incision was made, extending the vertical tear in the lower segment of the uterus (Figure 3). The infant was delivered through the opening and had Apgar scores of 6 and 9 at 1 and 5 minutes, respectively. The bladder was repaired, and a suprapubic catheter was placed by a consulting urologist. The uterus was closed with a two-layer closure technique. The involved tissues were unusually fibrotic, so bleeding was minimal throughout the procedure for a total blood loss of approximately 800 mL. The patient's bladder was drained with the suprapubic catheter for 1 week, and her postoperative hematocrit was 32 percent (from 38 percent after 3.5 L of fluid intraoperatively). The mother and infant did well, and neither patient developed any long-term complications.

Discussion

Complete uterine rupture is defined as a tear through the uterine wall and peritoneum and rupture of the gestational sac. An incomplete rupture spares the peritoneum. Uterine dehiscence is a tear that involves only scar tissue and does not extend to intact myometrium, and fetal membranes are not ruptured.[2]

The most common predisposing factor leading to uterine rupture is previous Cesarean section. The increase in the Cesarean section rate in the past two decades and the popularity of vaginal birth after Cesarean section (VBAC) has led to an increasing rate of maternal morbidity, especially rupture, though the mortality from VBAC is low.[3,4] Uterine rupture occurred in 1.8 of 1000 patients undergoing trial of labor after Cesarean section in a large multicenter study in California, whereas the rate in patients without previous Cesarean section is less than 0.7 in 1000.[1,4] Mortality from VBAC is favorable, with a rate of 7.5 in 100,000 when compared with spontaneous vaginal delivery mortality of 10 in 100,000.[3]

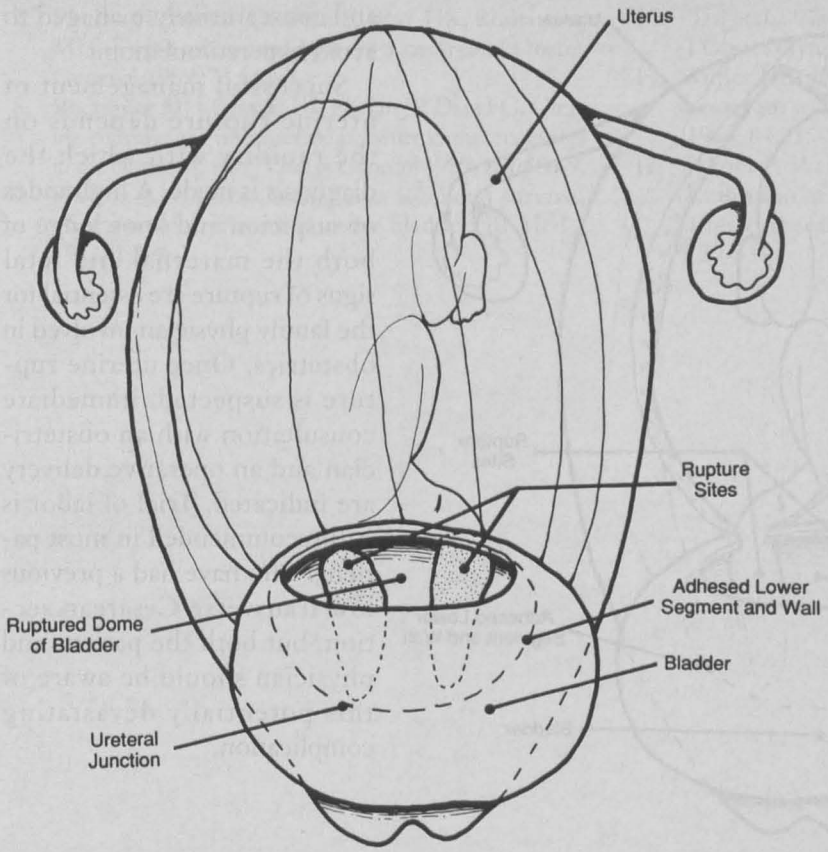

Figure 2. Appearance of bladder and uterus at surgery.

Other contributing factors that increase the risk of rupture include oxytocin augmentation,[5] transverse scars in the contractile portion of the uterus, vertical uterine scars, multiple Cesarean sections, grand multiparity, and trauma from manipulation of the fetus. One should bear in mind that uterine rupture can occur in an unscarred uterus as a result of abnormal mechanical forces. Abnormal fetal position, large fetal defects, or cephalopelvic disproportion play a major role in inducing rupture. The overall incidence of rupture in patients with previous low-transverse Cesarean section is 0.2 to 0.82 percent in large reviews in other western countries.[6,7]

The classic presentation of rupture of the uterus is characterized by a marked decrease in intrauterine pressure, cessation of labor, lower abdominal pain, acute abdominal signs, and eventually hypotension. Fetal signs are more varied depending on the compromise of blood flow to the placenta, but generally marked distress develops rapidly. Severe variables occur in 75 percent of cases of uterine rupture.[5,8] The reading obtained from the intrauterine pressure catheter can provide an important clue that the uterine wall is compromised, as the monitor no longer records accurately the intense contractions the patient experiences. In a review done by Rodriguez and others,[8] the intrauterine pressure catheter reading that most highly correlated with rupture was an increase in uterine tone with severe variables. Maternal mortality is 1 percent, whereas fetal mortality is as high as 50 to 75 percent if the fetus is extruded out of the uterus into the abdomen.[2,3]

Uterovesicular rupture is rare. Only three other cases have been reported in the English literature in the past 25 years.[5,9] This case is the only reported case of rupture of both the uterus and bladder in which the diagnosis was made before surgery. As in the other reports, uterine rupture resulted in a similar pattern of sudden onset of severe variable decelerations. In all the cases, the infants did well because their expulsion from the uterus was impeded by the bladder. In this patient, fibrotic scar tissue encased the blood and amniotic fluid extruded through the bladder, preventing the development of hemoperitoneum. The lack of peritoneal signs or hemorrhage made the diagnosis of rupture more elusive. Based on these four cases, it appears that uterovesicular rupture can be masked if the peritoneal reflection remains intact, as it did in the four cases now reported.

How many Cesarean sections is too many for a trial of labor? At this time there is no clear guideline when not to offer a trial of labor. Most of the reviews of uterine rupture in patients undergoing trial of labor dealt with patients who had had one or two previous Cesarean sections. These reviews showed that patients selected for trial of labor had a more favorable morbidity and mortality than those who underwent another Cesarean section.[4,7,10] Some patients in the review by Meehan

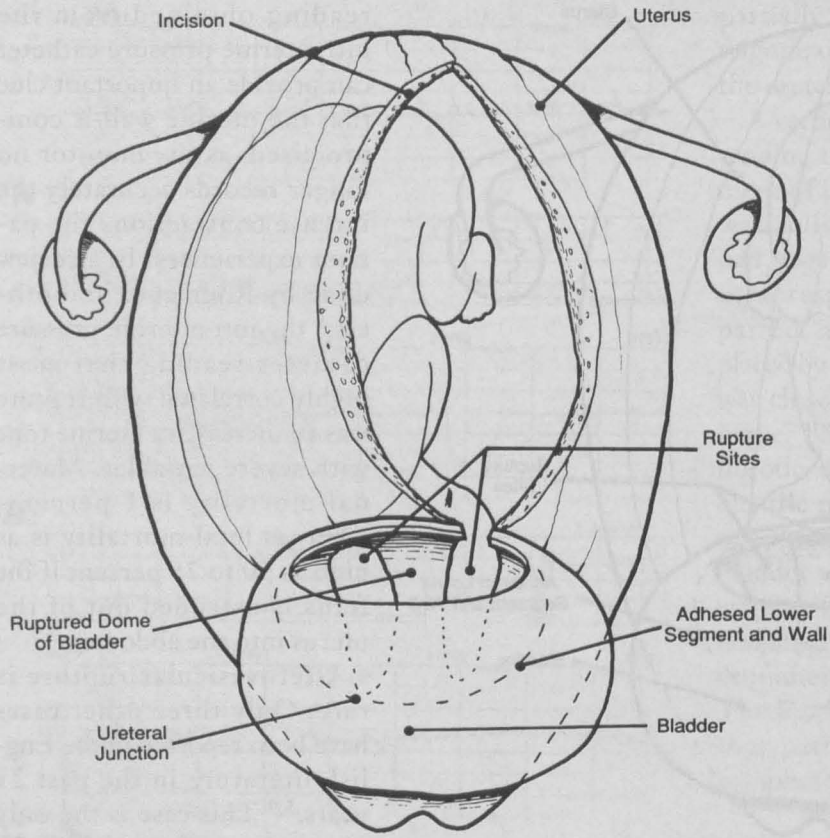

Figure 3. Surgical approach used for delivery.

and Magani[3] did have more than two previous Cesarean sections, but no conclusions were reached about what number of previous Cesarean sections would mandate a repeat Cesarean section rather than a trial of labor. The risk of rupture during trial of labor is three times higher in patients with two or more Cesarean sections when compared with patients with one previous Cesarean section[11]; however, morbidity is still lower than that from Cesarean section. The selection of patients for trial of labor should be influenced by any surgical record suggesting a weakened lower uterine segment, either at a previous repeat Cesarean section or from a manual exploration of the uterine scar after a successful vaginal delivery after trial of labor. Other factors that could increase the risks of VBAC would include a history of dystocia or macrosomia or evidence of a contracted pelvic outlet on examination. The predictive value of these factors in determining success or failure on an individual basis is less than 70 percent and 34 percent, respectively.[12] Oxytocin augmentation in all trials should be carefully and conservatively managed to avoid hyperstimulation.

Successful management of uterine rupture depends on the rapidity with which the diagnosis is made. A high index of suspicion and knowledge of both the maternal and fetal signs of rupture are essential for the family physician involved in obstetrics. Once uterine rupture is suspected, immediate consultation with an obstetrician and an operative delivery are indicated. Trial of labor is still recommended in most patients who have had a previous low transverse Cesarean section, but both the patient and physician should be aware of this potentially devastating complication.

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