Spontaneous uterine rupture:
A case study

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In the following article, the author reviews the incidence, symptoms, and treatment of the patient with spontaneous uterine rupture. A step-by-step approach to the anesthetic management of the patient is presented in the case study.

The classical signs of uterine rupture (sudden cessation of labor, moderate to severe abdominal pain, regression of presenting part, alterations in uterine contour, and shock) may be present in approximately one-third of the patients who have this complication. Shock is the most frequent symptom present. Ruptures have been reported to occur prior to labor and are common if the patient has had a previous cesarean section.

Rupture of the uterus occurs frequently in women of high parity. Over the years, the reports have shown a mean parity from 2.8-6.0. However, in 1979, Spaulding and Gallup reported a spontaneous rupture of a primigravida. Oxytocin infusion has been associated with rupture in as many as 26.8% to 28.4% of these cases.

As soon as the diagnosis is made, the next step is prompt surgical intervention. Fetal heart monitoring and constant attendance by the nursing staff is mandatory.

Only under special circumstances should the uterus be repaired. Sterilization is the suggested treatment if there is a history of previous rupture. General anesthesia is the anesthesia of choice because of its rapid induction. There is less hypotension and cardiac instability and better control of the airway and ventilation.

The case

This is a case report of a 27-year-old patient who was 331/2 weeks into the gestational period and had a history of two previous cesarean sections.
Her symptoms started around 0300 at home. First, she developed low back pain on the right side; this was followed by low abdominal pain, which prompted her to come to the hospital. She also complained of vertigo and nausea, and vomiting occurred shortly after she was admitted at 0455. Her vital signs were: blood pressure 90/50, pulse 64, respirations 16, temperature 94.6, FHT 150. Her weight was 77 kg. The patient was connected to a fetal heart monitor and was carefully observed.

At 0530, the patient was examined by her doctor. Her abdominal pain had become extreme and the uterus was tender, not hard. Her blood pressure decreased to 70/40, pulse was 60 and thready, and respirations were 22. Although she was pale, she was alert and responsive. The FHT increased to 160. Oxygen was started at 5 L/min, and a 16-gauge Jelco® needle was inserted in each arm for D5RL infusion. Blood samples were sent for stat type and cross match plus CBC. A diagnosis of premature separation of the placenta was made, and the patient was immediately taken to the delivery room.

Prior to anesthesia induction at 0615, the patient had received 1500 cc D5RL. Vital signs were: blood pressure 100/60, pulse 72 weak, respirations 28, temperature 94.0, Hct 25.1 vol%, Hgb 7.9 gm, WBC 19,400/cu mm. The patient's blood type was AB negative. Only one unit of this blood was available immediately in the hospital; six units were being sent from the main blood bank 15 miles away.

**Anesthesia care**

Oxygen was administered continuously from the labor room to the delivery room. Pancuronium 0.5 mg plus atropine 0.2 mg were administered intravenously. Monitors connected were: blood pressure cuff, ECG, temperature, precordial, esophageal lead, and block-aid. A fluid warmer was also used.

The sequence of anesthesia was: pre-oxygenation, induction with ketamine 100 mg and succinylcholine 100 mg, followed by cricoid pressure, and, beginning at 0628, intubation. After induction, blood pressure rose to 120/70, pulse 92, and controlled respirations were 16-20/min.

Upon entry into the abdomen, it was established that the uterus had ruptured. The uterine vent was vertical and involved almost the entire length of the anterior wall midline. After the clotted blood was removed, the placental cotyledon could be seen presenting into the wound. The placenta was then removed; the amniotic cavity was entered; and the infant was delivered.

The patient received 100% oxygen until the fetus was delivered at 0632. Then, the patient was started on a combination of 50% nitrous oxide and oxygen, plus Valium® (diazepam), Sublimaze® (fentanyl) and Pavulon® (pancuronium). The baby's Apgar score at one minute was 5 and at five minutes was 6; birth weight was 5 lbs 6 oz.

Post-delivery, the patient's blood pressure dropped to 90/60. Pulse was 104. Albumin and plasmanate were started to maintain vital signs until one unit of packed cells was available at 0710. Whole blood was started at 0730 as surgery was completed. Estimated blood loss was 2500 cc.

**Postanesthesia care**

The patient was given 100% oxygen by mask on her way to the post-anesthesia recovery area. She was able to respond to verbal commands. Vital signs were: blood pressure 96/44, pulse 92, respirations 22, and temperature below 94. Whole blood units 1 and 2 were running.

A central venous pressure catheter was inserted into the right jugular vein and a Foley catheter was inserted. An x-ray confirmed the correct placement of the CVP catheter. Initial cardiovascular pressure was 2-3 cm. Her CVP rose to 10 cm after administration of 1 unit of packed cells, 5 units of whole blood, 1400 cc of D5RL, 2000 cc LR, 1000 cc D5.2NS, 200 cc 0.9 NS, 500 cc plasmanate, and 200 cc albumin.

She was alert and comfortable in PAR and received her first pain medication at 1040. Her temperature rose to 98.0 rectal. She was discharged to the intensive care unit at 1300 in stable condition. Vital signs were: blood pressure 120/50, pulse 100, respirations 16, temperature 99.4 (oral), CVP 10. Blood count readings the following morning were: Hct 31.6 vol%; Hgb 10.8 gms; WBC 14,200/cu mm.

The patient had an uneventful postoperative recovery and was discharged on her seventh postoperative day. Upon discharge, her blood count was: Hct 31 vol%; Hgb 10.3 gms, WBC 9,300/cu mm. Vital signs were: blood pressure 110/70, pulse 68, respirations 18, temperature 97.6 (oral).

When asked if she had any recall during anesthesia, the patient said only that she was frightened when being taken to the delivery room, but she had no recall of the room itself. The next thing she remembered was several people taking care of her in the recovery room. She was well oriented on the night of surgery, and remembers the postanesthesia visit in great detail.
Anesthetic technique summary

As soon as rupture of the uterus is suspected, two large bore intracatheters (preferably 16- or 14-gauge) must be inserted, and blood drawn for CBC and type and cross match. If the patient is not in shock, one should insert an arterial line, CVP catheter, and Foley catheter.

The following technique has been successful in the anesthetic management of the patient with uterine rupture. If used, it should be followed as closely as possible depending on available time and assistance.

1. Obtain the patient’s anesthesia and medical history if possible.
2. Give an anti-acid, 30-60 cc 10 to 60 min before induction.
3. Give oxygen, place patient in Trendelenberg position, for left uterine displacement if shock is present.
4. Give oxygen continuously from labor room to delivery room and pre-induction.
5. Administer Robinul® (glycopyrrolate) 0.2 mg IV, pancuronium 0.5 mg 3-5 min prior to induction. A K-thermia blanket should be placed on the operating room table with a continuous temperature monitor.
6. When the patient is prepped and draped, administer thiopental 2-4 mg/kg or ketamine 1-2 mg/kg and succinylcholine 100 mg IV in rapid sequence.
7. As soon as drugs are administered an assistant should apply cricoid pressure until the endotracheal tube is in place and the balloon is inflated. Be sure bilateral breath sounds are equal. If shock is present, the patient may be kept on 100% oxygen until the infant is delivered. Otherwise, a mixture of 50% N₂O and 50% O₂ should be administered. Pancuronium supports the cardiovascular system and is a wise choice of a muscle relaxant.
8. After the infant’s cord is clamped, N₂O may be increased depending on blood loss and blood pressure. Sublimaze® (fentanyl) and Valium® (diazepam) in small increments will not hinder blood pressure until blood can be replaced.
9. If an assistant is present, a CVP and arterial line should be started to monitor fluid replacement.
10. If the patient remains hypotensive, ventilatory assistance may be necessary for 24 hours postoperatively. Extubate only when full reflexes have returned.
11. Finally, close follow-up in the form of frequent postoperative visits is of extreme importance until the patient is discharged from the hospital.

The above technique is important not only for ruptured uterine surgery, but should be followed for any true emergency when a tremendous loss of blood is expected.

At certain medical centers throughout the United States, patients who have had previous cesarean sections for abruptio, fetal distress, hemorrhage, and the like, are being delivered vaginally for repeat pregnancies. This may alert us to establish anesthesia procedures and policies to anticipate such a problem when a patient with this history enters our system, as the chance of sustaining uterine rupture will decidedly be increased.

REFERENCES


AUTHOR

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