ABSTRACT

Introduction: The change in obstetrical practices over the last decade in favor of trials of labor in patients with uterine scars has resulted in increased incidences of uterine ruptures. Although neither repeat cesarean delivery nor a trial of labor is risk free, evidence from a large multicenter study shows vaginal birth after the cesarean (VBAC) is associated with shorter hospital stays, fewer postpartum blood transfusions, and a decreased incidence of postpartum maternal fever. The uterine rupture remains the most serious complication associated with VBAC. Factors associated with uterine rupture include excessive exposure to oxytocin, dysfunctional labor, and a history of more than 1 cesarean delivery. Because uterine rupture may be a life-threatening event, intrapartum surveillance and the ability to perform an emergency surgery are both necessary when trial of labor is allowed. Until now, no early symptoms pathognomonic to uterine rupture had been described. We share our experiences with the novel approach to the problem - an intrapartum endoscopy.

Materials and Methods: Endoscopic examination was accomplished by using the intraoperative fiberscope (Olympus and Endoview system (Costa Mesa, CA, USA) (Figure 1). A gas-sterilized 25-cm long fiberscope is introduced into the amniotic cavity through the cervical canal after rupture of the membranes. The distance between the fiberscope and the object varies from 3 to 50 mm. The fiberscope has a separate channel for the fluid infusion (normal saline) throughout the procedure; the surgeon looks through the eyepiece directly and exhibits control over the flexible scope. The duration of endoscopy is less than 15 minutes. The inserting of the endoscopic device is very similar to that of insertion of an intrauterine pressure catheter.

The IRB Committees of both participating institutions approved the study protocol.

Twenty-eight patients with an unknown or poorly documented site of the uterine scar were included in the study. An ultrasound examination had been performed on all patients prior to endoscopy to assess fetal well-being and placental location. The ages of the patients ranged from 21 to 38 years. Eighteen women had 1 previous cesarean delivery, and 10 had 2. The performance of intrapartum endoscopy did not interfere with fetal monitoring: 21 fetuses were monitored externally, 7 internally.

Indications for previous cesarean deliveries were as follows: fetal distress in 11 cases, failure to progress in labor in 8, placenta previa in 2, and unknown in 7. Twenty-one patients delivered vaginally; 7 had had repeat cesarean deliveries. All neonates were born in satisfactory condition. The Apgar scores at 1 minute varied from 7 to 9 and at 5 minutes from 8 to 10. The integrity of the uterine wall was assessed by manual postpartum uterine exploration in each case of vaginal delivery and by visualization and palpation of the scar site in each abdominal delivery.

Results: The lower uterine segment and contractile portion of the anterior uterine wall were visualized successfully in all patients. In 25 patients, the presumed scar site looked totally indistinguishable from the rest of the lower uterine segment and anterior uterine wall. Two scars were identified as vertical in 2 patients who were delivered by a repeat abdominal operation. A vertical scar appears as a groove running in a cephalad-caudad direction from the lower uterine segment into the contractile portion of the anterior uterine wall. The usefulness of the intrapartum endoscopy is best demonstrated by the following case reports (2 of 28 study cases).

Key Words: Endoview, Intraoperative fiberscope, Intrapartum Endoscopy, Vaginal birth after cesarean, Uterine scars.
CASE REPORT 1
A 26-year-old gravida 2, para 1 female was undergoing VBAC. An excessive bloody show was detected, and the patient was prepared for surgery having a presumptive diagnosis of uterine rupture. An endoscopic examination was performed prior to the onset of surgery and revealed negative results. (No uterine rupture detected). The labor was allowed to continue and resulted in an uneventful vaginal delivery.

CASE REPORT 2
A 31-year-old gravida 5, para 3 female was in the active phase of labor trial after 2 previous cesarean deliveries. A nonreassuring fetal heart rate pattern (persistent variable decelerations) was diagnosed and interpreted as a possible sign of fetal distress due to uterine rupture. An endoscopic examination was performed while the preparation for operative delivery was in progress. The lower uterine segment was intact. Two loops of umbilical cord were seen endoscopically around the fetal neck. An amnio-infusion was started and resulted in marked improvement in the fetal heart rate tracing. An uneventful vaginal delivery took place 4 hours later.

DISCUSSION
The cesarean delivery rate in the United States increased from 5% to 20.8% between 1970 and 1995 and reached 24.7% in 1998. It is generally agreed that the current cesarean delivery rate is too high. The overall number of cesarean deliveries can be reduced safely and effectively. However, most efforts in decreasing cesarean delivery rates have focused on decreasing the numbers of elective repeat cesarean births because they account for one third of all cesarean deliveries.

Current data indicate that a trial of labor is successful in 60% to 80% of patients who had low transverse uterine incisions for previous deliveries and who were candidates for vaginal birth in subsequent pregnancies. The incidence of uterine rupture is not increased significantly by a trial of labor, particularly if the previous uterine incision is low transverse. Uterine scar interruption may be asymptomatic and has been found incidentally in up to 2% of patients. Symptomatic uterine rupture requiring emergency intervention occurs in 1% of all attempted vaginal births after cesarean deliveries. The most common sign of uterine rupture is an abrupt change in fetal heart rate pattern, including bradycardia or prolonged decelerations.

Although the incidence of uterine rupture is relatively low, its impact on maternal and neonatal morbidity is quite significant. Fetal mortality as a result of placental separation may be as high as 28% after rupture of the scarred uterus. Golan et al reported a 22% fetal mortality rate in 36 patients whose uteri ruptured during a trial of labor. Timely diagnosis of threatened uterine rupture, prior to the development of catastrophic events, is extremely difficult due to the lack of distinct clinical symptoms. Prenatal ultrasound examination is not useful in the diagnosis. Early signs of uterine rupture, such as vaginal bleeding and abdominal pain, are nonspecific and are commonly seen during normal labor. We share our experience with the endoscopic approach to the problem of uterine rupture. For decades our colleagues in gastroenterology, general surgery, urology, and other specialties have been using endoscopy to assess the integrity of internal organs (stomach, colon, bladder, and others). We have been using endoscopy in obstetrical practice for over 20 years for the following indications.

1. Studying fetal behavior in labor.
2. Performing “neurological” examination of the fetus using the probe of the endoscope as a stimulator.
3. Performing fetal therapy via umbilical vessels under constant visual control.
4. Relieving umbilical cord compression by displacing the involved segment of the umbilical cord under direct visual control.
5. Performing umbilical blood sampling for acid-base status, leukocyte, erythrocyte, and thrombocyte counts in situations in which the fetal presenting part is not accessible.

Recently, we have started using endoscopy to assess the location and integrity of uterine scars in laboring patients. Intrapartum endoscopy is not associated with increased fetal or maternal morbidity. In our experience, endoscopic visualization of the scar site is helpful in identifying the scar in patients with no record of previous surgery. Two such patients with vertical scars were identified in this series and excluded from labor trial.

Endoscopic assessment appears useful in patients with symptoms suspicious for, but not diagnostic of, uterine
rupture. Two such cases are presented in this report. Both patients were spared surgery and allowed to continue labor.

Intrapartum endoscopy is a safe procedure; our initial concerns of uterine perforation, intrapartum infection, and maternal and fetal trauma failed to materialize. Postpartum infectious morbidity in patients who underwent endoscopy did not differ from that in the control group. No case of uterine perforation, fetal or maternal injury, or any of these together, have been reported in the literature. The procedure does not cause patients discomfort and requires no anesthesia.

CONCLUSION

In summary, we feel it is time to include intrapartum endoscopy in obstetrical practice, in selected cases.

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