New Device Determines Safety of Vaginal Birth after Cesarean

On the face of it, to say that a scar can get a good look at a surgical scar does not sound like news. But what if it is the scar from a cesarean section in a woman who is due to have another child and who now wants to deliver vaginally? What if the obstetrician can see the scar from inside the uterus? What if it can be done during labor itself? And what if this technique can be used to see whether the scar from an earlier cesarean scar shows signs of tearing? When that opens, a woman is at risk for rupture of the uterus, a very significant complication of labor and delivery, and must have a cesarean delivery.

This very new procedure is what Dr. Boris Petrikovsky, M.D., Chief of the Division of Maternal-Fetal Medicine at North Shore-Manhasset, and his colleagues are using, and it is very noteworthy indeed.

“We use this technique to examine the scar to make labor safer for the woman who wants to give birth vaginally after having a C-section,” Dr. Petrikovsky said. “And it’s clear that this technique, if it is properly used, is safe and painless.”

It used to be that once a woman had a baby by a cesarean section, she was considered a poor risk for vaginal birth. Particularly in earlier years, when vertical surgical incisions were used to open the uterus, the possibility that the scar would tear from the inside and the uterus would rupture was just too great. However, new surgical techniques for cesarean deliveries have lessened that risk for many patients, and vaginal birth after cesarean (VBAC) is not only possible but desirable.

Nevertheless, it is still critically important to identify patients who are not good candidates for VBAC to prevent these serious complications. Uterine rupture can be associated with severe bleeding or with the death of the fetus, but diagnosing a threatened rupture can be difficult.

Dr. Petrikovsky said.

“You can see clinical indications that the scar may rupture and do a Cesarean section only to find that the scar was sound,” he said. “And you can also have a rupture without advance warning. It goes both ways.”

To give obstetricians a more accurate assessment of the risk of rupture, Dr. Petrikovsky can insert a hysteroscope, which is able to visualize the wall of the uterus, into the uterus during early labor. The endoscopic probe is very small, but large enough to transmit an image of the inner wall of the uterus and the surgical scar to a monitor where it can be observed. “If it looks okay, we know the patient can proceed with labor,” he said.

North Shore/Manhasset is using the endoscopic technique as part of a research study to confirm the findings of European studies in which about 200 patients in labor were examined using the hysteroscope. Patients who qualify for the study have had cesarean sections using a transverse, or vertical, incision. The assessment must be made in the early stages of labor.

For more information about this procedure and the Division of Maternal-Fetal Medicine, please call (516) 362-4458.
"Endoview" Project of Intrapartum Endoscopy

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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.1 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.2 Because uterine rupture may be a life-threatening event, intraoperative 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 intrapartum fibroscope (Olympus and Endowiew system (Costa Mesa, CA, USA) (Figure 1). A gas-sterilized 25-cm long fibroscope is introduced into the amniotic cavity through the cervical canal after rupture of the membranes. The distance between the fibroscope and the object varies from 3 to 50 mm. The fibroscope 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 the endoscopy is less than 15 minutes. The inserting of the endoscopic device is very similar to that of insertion of an intratuterine 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 placentation. 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 fibroscope, Intrapartum Endoscopy, Vaginal birth after cesarean, Uterine scars.
Endoscopic Assessment of the Integrity of the Postcesarean Uterine Wall Before a Trial of Labor

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Transcervical Endoscopy Registry

Endoscopic examination of the uterine scar site was performed on 52 women prior to a trial of labor after a previous cesarean section. A sterilized intraoperative fiberscope was introduced into the amniotic cavity after rupture of the fetal membranes under constant visual guidance. In 45 cases the site of the previous incision appeared unremarkable, and a scar from the previous surgery could not be identified. “Compromised” scars were detected in three patients, and scars were identified as vertical in four patients with no record of the type of uterine incision used for the previous surgery. Endoscopic data were confirmed postpartum in all cases. This approach seems beneficial in selected cases. (J Reprod Med 1994;39:464-466)

Keywords: hysteroscopy, trial of labor, vaginal birth after cesarean.

Introduction
Vaginal birth after previous cesarean section is becoming the state of the art in managing patients with a previous cesarean section. Uterine rupture remains the most significant complication in these patients. A number of techniques have been proposed to assess the condition of the uterine scar prior to allowing a trial of labor. Clinical impression and ultrasound examinations of the scar site on the uterine wall are not reliable modalities in diagnosing “compromised scars.” Intrauterine pressure monitoring is also not very helpful. In one series of 10 women with scar rupture after a previous lower segment transverse cesarean section, uterine activity, as judged by intrauterine pressure values, was within normal limits. We introduced endoscopic assessment of the uterine scar site prior to a trial of labor.

Materials and Methods
Endoscopic examination was accomplished by using the intraoperative cholechochofiberscope (Olympus, Tokyo, Japan). The length of the endoscope is 65 cm, its thickness is 5.8 mm, and the angle of vision is 75°. A gas-sterilized cholechochofiberscope is introduced into the amniotic cavity through the cervical canal after spontaneous or artificial rupture of the membranes. Dilation of the cervix to 1 cm is necessary for introduction of the fiberscope. The cholechochofiberscope is inserted under constant visualization to avoid trauma to the fetus and mother.

The distance between the end of the fiberscope and the object varies from 3 to 50 mm. The duration of endoscopy is <15 minutes, and the procedure is well tolerated by patients. No anesthesia is necessary. The procedure of inserting the endoscopic device is very similar to that of inserting an intrauterine pressure catheter.

Eighty-six patients with an unknown or poorly documented site of the uterine scar were included in the study. Based on our initial experience of inability to see the scar site in patients with anterior placentas, all patients underwent ultrasound examinations, and 34 with anterior placentas were excluded from endoscopic assessment. Endoscopy was performed on the remaining 52 patients. The ages of the patient ranged from 21 to 37 years. Forty-eight women had had one previous cesarean section, and four had had two.

Indications for previous cesarean section were fetal distress in 27 cases, failure to progress in
labor in 16, placenta previa in 6 and unknown in 3. Forty-one patients delivered vaginally; 11 had repeat cesarean sections. All neonates were born in satisfactory condition. The Apgar scores at one minute varied from 7 to 9 and at five 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 repeat cesarean section.

Results
The lower uterine segment and contractile portion of the anterior uterine wall were visualized successfully in all patients. In 45 patients the presumed scar site looked totally indistinguishable from the rest of the lower uterine segment and anterior uterine wall. Forty-one of these patients (91%) had a normal, spontaneous vaginal delivery; four patients had a repeat cesarean section because of failure to progress in labor (three cases) and fetal distress (one case). No evidence of incompetent scars was detected intraoperatively or during manual postpartum exploration of the uterus in these patients.

Abnormal endoscopic findings were detected in seven cases. In four patients with an unknown type of prior cesarean section the scar site was identified as vertical based on visualization of the groove running in a cephalad-caudad direction from the lower uterine segment into the contractile portion of the anterior uterine wall. Three other abnormal findings were a large “window” in the central portion of the transverse scar (one case) and dehiscence of two-thirds of the transverse scar with bleeding edges and visualization of loops of small bowel (two cases). None of these patients had definitive clinical signs of a ruptured uterus (excessive bleeding, fetal distress, abdominal pain). All seven patients underwent repeat cesarean section without a trial of labor. The endoscopic findings were confirmed intraoperatively in all these cases.

Discussion
A trial of labor in women who have had a cesarean section is successful in 60–70% of cases. Rupture of a previously scarred uterus remains the major potential complication in these patients. The incidence of uterine rupture, according to a metaanalysis by Horowitz et al, is 0.6%. Farmer et al reported a 0.8% rate of uterine rupture in addition to a 0.7% rate of bloodless dehiscence. Although the incidence of uterine rupture is relatively low, its impact on maternal and neonatal morbidity is significant. Fetal mortality as a result of acute hypoxia due to placental separation could 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 after a previous cesarean section. Timely diagnosis of threatened uterine rupture prior to the development of catastrophic events is extremely difficult due to the lack of distinct clinical features. Early signs of uterine rupture, such as vaginal bleeding and abdominal tenderness, are nonspecific and commonly seen during uncomplicated labor. The classic signs of ruptured uterus occur relatively rarely (3.4% in cases of scar dehiscence and 7.6% in cases of uterine rupture). Fetal distress manifested by prolonged decelerations is the most common sign of uterine rupture, appearing late in the course of the disease, and often contributes to perinatal morbidity and mortality.

Jones et al reported eight cases of rupture of a low segment cesarean section scar during trials of labor despite having met American College of Obstetricians and Gynecologists guidelines for a trial of labor. Jones et al observed a progression of signs, from nonspecific (variable decelerations) to more pathognomonic (recession of the fetal head), in 50% of cases. In two cases, fetal heart rate changes were ascribed to umbilical cord compression and oxytocin hyperstimulation, and another two cases a conclusive diagnosis was not made until laparotomy. Neonatal complications in this series included one neonatal death and two cases of severe perinatal asphyxia. A similar experience was reported by Scott, who analyzed 12 cases of uterine rupture during a trial of labor after a previous cesarean section (11 after low transverse incisions and 1 after a low vertical incision). Uterine rupture was defined as complete separation of the uterine wall, with or without expulsion of the fetus, endangering the life of the mother or fetus. Two perinatal deaths and two cases of significant long-term neurologic impairment were observed in this series. All the mothers survived, but six infants (50%) were severely depressed at birth.

Endoscopy and hysteroscopy have been used successfully for diagnostic and therapeutic pur-
poses in surgical and gynecologic practice. Endoscopy in late pregnancy and labor has been used to diagnose umbilical cord abnormalities, detect meconium in amniotic fluid, confirm fetal malformations in unclear cases and release loops of the umbilical cord from the fetal neck in utero. 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. In our series four such patients underwent repeat cesarean section based on the endoscopic diagnosis of vertical uterine scars. This is especially important in view of the fact that the incidence of uterine rupture after previous classic cesareans could reach 12%. Conversely, identification of an intact transverse scar in a patient with an unknown scar location can serve as an inclusion criterion for a labor trial.

Intrapartum endoscopy is also useful in the diagnosis of a compromised uterine scar prior to the appearance of clinical symptoms. Visualization of scar dehiscence, bleeding scar edges or visualization of intraabdominal organs prompts operative delivery without fetal or maternal morbidity. Endoscopic examinations could be repeated in the course of labor if clinically indicated. This may be very useful in patients with symptoms suspicious for but not diagnostic of uterine rupture.

The validity and role of intrapartum endoscopy in preventing uterine rupture during a trial of labor and making vaginal birth after a cesarean section a safer modality needs to be investigated further.

References


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