

LETTER TO THE EDITOR

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Dissection of the uterine wall in a scarred uterus: a case report



Sanne J. M. Zilver^{1,2}, Wouter Wegdam² and Angelo B. Hooker^{1,2*} 

Abstract

Uterine rupture is a potentially fatal complication during pregnancy, delivery, or postpartum. Women attempting a trial of labor after a cesarean section have an increased risk of a subsequent rupture. We report a case of a 24-year-old woman, gravida 2 para 1 with a previous cesarean section who underwent a trial of labor. During labor she complained of pain while labor progressed rapidly. Because of signs of fetal distress, a vacuum extraction was performed. Two hours after delivery, the patient complained again of severe abdominal pain. Blood accumulated in a previously non-existent area between the serosa and uterine muscle. A dissection of the uterine wall occurred with serious clinical consequences, compatible with a complete uterine rupture. Emergency laparotomy was performed to repair the uterine wall; a hysterectomy was prevented.

Keywords: Uterine rupture, Trail of labor, Complication, Postpartum hemorrhage, Case report

Background

Uterine rupture (UR) is a potentially dangerous complication affecting both mother and child and is considered an unpredictable obstetric emergency [1–4]. In the literature, a UR, also referred to as a complete rupture, is defined as a disruption of all layers of the uterus with or without expulsion of the fetus: the uterine serosa together with the uterine muscular layer is perforated and the amniotic cavity directly communicates with the abdominal cavity [2–5]. An incomplete UR, a uterine dehiscence is considered another entity which is usually detected during a cesarean section [1–6]. In case of incomplete dehiscence, there is an incomplete separation of the uterine scar but the serosa is preserved and this has no clinical consequences and is asymptomatic according to the available literature [1–4].

In the unscarred uterus, UR is a rare phenomenon; it is mainly reported during a trial of labor after a previous cesarean section [1–4, 7]. Due to the increasing rate of cesarean sections over the past decade, the incidence has

risen. The reported incidence of UR differs considerably depending on various parameters, including study type, population studied, and country, ranging from 0.051 to 1% in women with a previous cesarean section and around 0.008% for women without a prior cesarean section [7, 8]. We describe an exceptional uterine scar defect after a prior cesarean section.

Case report

A 24-year-old gravida 2 para 1, with an unremarkable medical history, received prenatal care in our out-patient department. Her first pregnancy ended in an elective lower segment cesarean section at 38 + 4 weeks of gestation: a healthy boy was born weighing 3500 g. The recovery was uneventful. As the procedure was performed in another country, documentation and details of the procedure were not available.

Four years later, she became pregnant again and had a regular course of her pregnancy. The lower uterine segment thickness was assessed during pregnancy and was normal, a thickness of 3.5 mm. The patient chose for a trial of labor after counseling about the risks. Labor began at 40 + 4 weeks of gestation. Monitoring of the fetal heart rate by cardiotocography showed a good fetal condition. Ten milligrams of morphine was

* Correspondence: hooker.a@zaansmc.nl; a.b.hooker@hotmail.com

¹Department of Obstetrics and Gynecology, Zaans Medical Center, Koningin Julianaplein 58, P.O. Box 210, 1500 EE Zaandam, the Netherlands

²Department of Obstetrics and Gynecology, Amsterdam UMC, location VU University Medical Center, Amsterdam, the Netherlands

administered for pain management at the start of labor. Due to lack of progression, the membranes were ruptured artificially, with clear amniotic fluid and labor progressed.

Approximately 5 h after the first dose, the patient complained again of pain. She had 6 to 7 cm of dilatation; the pain was presumed to be related to the progression of labor and she received a second dose of morphine of ten milligram. Thereafter, she rapidly progressed to full dilatation. Ten minutes after she started pushing, the cardiocography showed signs of fetal distress and therefore a vacuum extraction was performed. A boy was born, weighing 3450 g and had 1- and 5-min Apgar scores of 9 and 10, respectively. There were no complications with the afterbirth. The estimated blood loss was 800 ml.

Two hours after the delivery, the patient complained of sudden onset of severe pain in the left lower abdomen. The vital signs were as follows: temperature 37.0 °C, blood pressure 109/67 mmHg, and a pulse of 155/min. On physical examination, a contracted uterus was palpated. An ultrasound showed free fluid in the lower abdomen with an enlarged and filled uterine cavity. As the tone of the uterus was adequate without vaginal bleeding, uterine atony was considered less likely. Because of a previous cesarean section, a uterine scar defect was suspected.

As the situation was unclear, an exploratory laparoscopy was performed to evaluate the uterus and to rule out a UR before considering manual inspection of the uterus. Approximately 100 ml of blood was discovered in the lower abdomen. The uterus was enlarged without signs of a uterine perforation. Although the serosa of the uterus was intact, there was a remarkable difference in appearances of the uterus. The fundus of the uterus had a normal aspect (Fig. 1a), with an abrupt transition just above the lower segment (Fig. 1b). The lower uterine segment was intact but swollen and abnormally thin; blood was visible through the serosa (Fig. 1c).

As there was no sign of a UR and the cavity of the uterus seemed filled on the ultrasound, the uterus was manually inspected immediately. The uterine cavity was filled with blood clots without placental remnants but a defect was palpated at the front wall of the uterus. Thereafter, deterioration of the vital signs occurred leading up to shock, with rapidly 1500 ml of blood loss. As the condition deteriorated and remained unclear, an emergency laparotomy was performed. The uterus was intact and enlarged, especially at the lower segment, again without signs of a UR. The uterus was normally located, without distortion or incarceration. The vesico-uterine fold was located; the bladder did not overlay the lower uterine segment. The uterine consistency at the fundal region was normal with good contraction while

the lower segment was thin, relaxed without tension: a feature compatible with an incomplete UR.

A transverse incision was made; the serosa was opened at the site of the uterine scar. The layers of the uterus were separated: there was a tear between the serosa and uterine muscle, causing blood to accumulate in a previously non-existent area. The site was reconstructed by closing the layers and the uterus was rebuilt, with adequate hemostasis. In total, six packed cells and two fresh frozen plasma packs were administered. The post-operative period was uneventful and the patient was discharged after 4 days of observation. Three months later, the patient was in good condition with a normal menstrual cycle. She was very glad that a hysterectomy was prevented. We advised the patient to undergo a planned cesarean section in subsequent pregnancies.

Discussion

We describe a symptomatic, incomplete uterine scar defect after a previous cesarean section with severe clinical consequences. This situation is exceptional as incomplete ruptures are considered to be asymptomatic without clinical consequences [3, 6]. In this case, there was active bleeding; blood accumulated in the area between the serosa and uterine muscle and led to extensive blood loss. After reviewing the literature, this is the first case describing a postpartum dissection of the uterine wall, an incomplete UR leading to severe clinical consequences.

The overall risk of a UR during or after delivery is low, but elective repeat cesarean delivery is not guaranteed to prevent uterine rupture. A trial of labor after a cesarean section poses an additional risk of 0.27%: approximately 370 elective cesareans must be performed in order to prevent one symptomatic UR during a trial of labor [7]. A UR can lead to various symptoms such as: abdominal pain, vaginal bleeding, hemodynamic instability, a difference in contraction patterns, and fetal heart rate abnormalities [1–4]. In the postpartum period, the most likely symptoms are abdominal pain and persistent vaginal bleeding despite the use of uterotonic agents. Potential maternal complications are the need for a blood transfusion due to significant hemorrhage or the need for a hysterectomy while fetal complications include pathologic fetal acidosis and perinatal death [4, 9].

Predisposing factors of a UR include a previous UR, previous fundal or high vertical incision, induction of labor, the use of oxytocin, and labor itself instead of a repeat cesarean section. Increasing maternal age, gestational age beyond 40 weeks, birth weight of more than 4000 g, an inter-delivery interval less than 18 to 24 months, more than one previous cesarean section and a thin residual myometrium, less than 2.0 mm, are considered possible risk factors [10–13]. There is growing

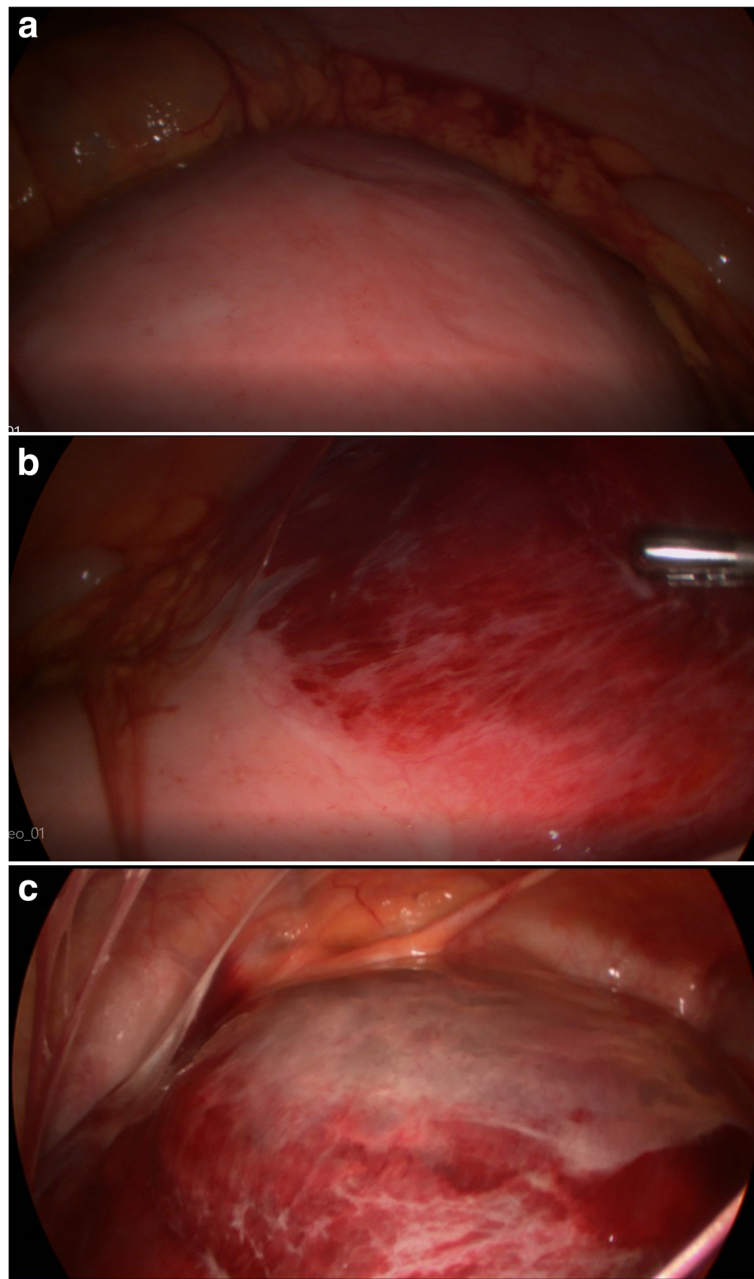


Fig. 1 Findings during diagnostic laparoscopy. **a** The fundus of the uterus has a normal aspect and appearance. **b** Above the lower uterine segment an abrupt transition was noticed. **c** The lower segment of the uterus is swollen, extremely thin and blood was visible through the serosa (hemoperitoneum)

evidence suggesting that the surgical technique for uterine closure following cesarean delivery influences the healing of the cesarean scar, but there is still no consensus on the optimal technique: single- and double-layer closure of the uterine incision are associated with a similar incidence of UR in a subsequent pregnancy [14].

In our case, no additional risk factors were present at the start of labor, except a previous cesarean section and gestational age beyond 40 weeks. There was

no sign of thinning of the uterine myometrium during pregnancy. The patient reported pain as labor progressed, but there were no signs indicating a UR. There was a normal fetal heart rate pattern and as labor progressed rapidly there was a logical explanation for the pain. Short thereafter, pushing was started and subsequently a vacuum extraction was performed due to fetal distress. The first hours of the postpartum course were unremarkable.

Surprisingly, 2 hours after labor the patient reported progressive heavy pain. The pain intensified because of accumulation of blood between the layers, leading to significant hemorrhage, requiring blood transfusion. A laparoscopy was performed, because the situation was unclear and a UR could not be ruled out, with a remarkable difference in appearance between the fundus and lower segment of the uterus due to accumulation of blood in the broad ligament and extraperitoneal spaces (Fig. 1). Exploratory laparotomy is the most commonly used method to confirm an uterine rupture in clinical practice. However, laparoscopic uterine repair has been reported in the postpartum period [15–17]. At the end, the diagnosis of a dissection of the uterine scar was confirmed by laparotomy. The uterine wall defect was successfully repaired thereby preventing a hysterectomy. We could not identify other potential risk or predisposing factors.

The dissection of the uterine scar was diagnosed during laparotomy after a surgical work-up was conducted. One of the most important signs to be able to detect a dissection is the contradiction of clinical signs (hemodynamic deterioration) in combination with lack of vaginal bleeding, with an enlarged and possibly filled uterine cavity. This feature can be explained by the fact that blood accumulated in a previously non-existent area, resembling a filled cavity on ultrasound. To diagnose a dissection, first uterine atony should be excluded and treatment with uterotonic agents should be considered as well as manual exploration. Second, intraabdominal bleeding (hemoperitoneum) and UR should be excluded as possible causes by laparoscopy or laparotomy, depending on the clinical situation and surgical skills.

A remarkable finding during the laparoscopy was the difference in appearance between the fundus and lower uterus segment. The laparoscopy did add valuable information to the situation and diagnosis. A laparotomy is the treatment method in case of a dissection to try to prevent a hysterectomy. The time at which the rupture occurred cannot be determined. We are tempted to conclude that the tear occurred during labor, at the time the patient reported pain and required a second dose of morphine. The fetal distress which occurred thereafter might presumably have been another sign of the incomplete rupture and substantiates our assumption.

Conclusion

Diagnosing a UR can be difficult while prompt recognition and treatment of this obstetric emergency is essential because of the potential morbidity and mortality for both mother and fetus. Dissection of the uterine wall, an exceptional uterine scar defect, is an unpredictable obstetric emergency which can be difficult to detect.

Although the laparoscopic findings are of interest, the key points in the diagnosis are the ultrasound findings: low level of intraabdominal liquid with a “filled uterus”. After excluding uterine atony and intraabdominal bleeding as possible causes, a UR or incomplete rupture with intramuscular uterine bleeding should be considered a possible complication with an emergency laparoscopy or laparotomy as an immediate consequence, depending on the clinical situation and surgical skills. A laparotomy is the treatment method in case of a dissection to prevent a hysterectomy. Knowledge of this phenomenon is important for recognition and to be able to prevent a hysterectomy.

Abbreviations

UR: Uterine rupture

Acknowledgements

N/A

Authors' contributions

All authors contributed to the selection of data and the presentation of the manuscript. All authors read and approved the final manuscript.

Funding

No funding to declare.

Availability of data and materials

Not applicable

Declarations

Ethics approval and consent to participate

The current study was approved by the institutional Review Board and Ethical Committee of the Zaan Medical Center, Zaandam, the Netherlands. The patient has provided written consent for submission and publication.

Consent for publication

Patient consented for the publication

Competing interests

The authors declare no competing interests.

Received: 20 June 2020 Accepted: 18 February 2021

Published online: 02 March 2021

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