Unscarred Uterine Cervical Rupture During Second-trimester Termination Using Misoprostol

Shu-Jung Lee, Jen-Min Su[1]*, Wan-Ling Shen[2], Fong-Ming Chang

Department of Obstetrics and Gynecology, National Cheng Kung University Medical College and Hospital, [1]Department of Obstetrics and Gynecology, Sinlau Hospital, and [2]Department of Pathology, National Cheng Kung University Medical College and Hospital, Tainan, Taiwan.

Disruption of a prior uterine incision scar after using misoprostol in term pregnancies has been well documented [1,2]. Nevertheless, second-trimester termination using misoprostol may result in rupture in an unscarred uterus [3]. This complication is extremely rare and can be life-threatening and lethal if not well managed. Herein, we report a case of uterine rupture after using misoprostol for second-trimester termination, with no previous uterine surgery. The patient was diagnosed in time and underwent emergency operation. She recovered well 6 days after operation and was then discharged in good condition.

A healthy 32-year-old woman was admitted to a local clinic for termination at 21 weeks of gestation because of intrauterine fetal demise. Her obstetric history consisted of two spontaneous vaginal deliveries and one ectopic pregnancy, which was treated by right salpingectomy. Besides, she had no other medical or surgical history, including no uterine incision or cervical surgery, and did not take any medication before admission.

After admission at the local clinic, she was given misoprostol 150 μg intra-rectally. Twenty-four hours later, an additional dose of misoprostol 100 μg was given orally. After taking the oral misoprostol, she suffered an acute, sudden and persistent lower abdominal pain, with profuse bloody show followed by hypovolemic shock. She was transferred to our hospital for emergency treatment. At the emergency service, pelvic examination revealed a distended abdomen with board-like abdominal muscle guarding and pelvic pain with lifting. Ultrasonography revealed a dead singleton fetus in breech presentation and partial placenta previa. In addition, a huge echo-free space was noted in the peritoneal cavity.

Emergency laparotomy was undertaken, and bloody ascites emerged immediately after the abdominal cavity was opened. Hysterotomy at the lower segment of the anterior uterine wall was performed to first remove the fetus and placenta. Notably, there was a fist-sized perforation over the left side of the endocervix with acute bleeding. Primary suture of the ruptured uterus was attempted initially but in vain. Therefore, total abdominal hysterectomy (with conservation of both ovaries) was performed to control bleeding and hypovolemic shock. The total blood loss of the operation was 4,500 mL. Under volume replacement therapy (12 units of packed red blood cells, 2 units of fresh frozen plasma), the patient was sent to our intensive care unit for postoperative management for 2 days. She had a smooth uneventful postoperative recovery and was discharged 6 days later in good condition.

Postoperative histopathologic examination confirmed the diagnosis of uterine endocervix laceration, possibly due to the use of misoprostol. Grossly, there was a perforation (9.3 cm in diameter) over the left side of the endocervix, with hemorrhagic tissue and blood clots (Figure 1). After being dissected, the cervix was shown to be eroded with a perforation as described above. Irregularly thickened hemorrhagic plaques can be seen at the endometrium and myometrium over the posterior wall near the fundus (Figure 2). Microscopically, marked hemorrhage was noted around the perforation without any evidence of placenta accreta or increta.

Uterine rupture is a major obstetric hazard, most commonly involving a previous uterine scar [4,5]. Nevertheless, although rupture of an unscarred uterus in pregnancy is an extremely rare event, the risk should not be neglected. The incidence of rupture of an unscarred uterus in pregnancy is estimated to be around

*Correspondence to: Dr Jen-Min Su, Department of Obstetrics and Gynecology, Sinlau Hospital, 20, Lingtzulin, Hsiao-Pi Li, Madou Town, Tainan, Taiwan.
E-mail: gynaesu@yahoo.com.tw
Accepted: April 24, 2007

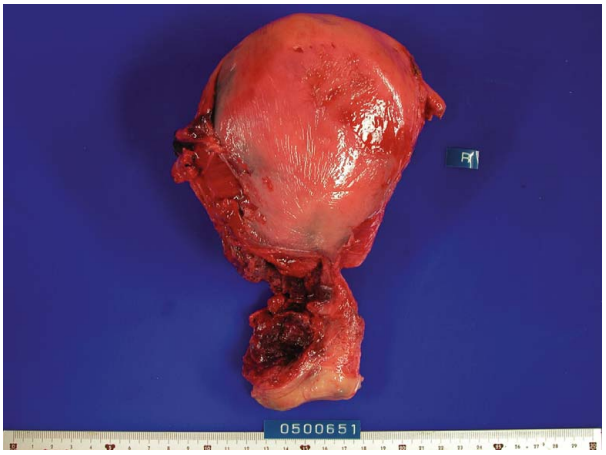

Figure 1. A perforation hole localized on the left side of the endocervix with hemorrhagic tissue and blood clots.

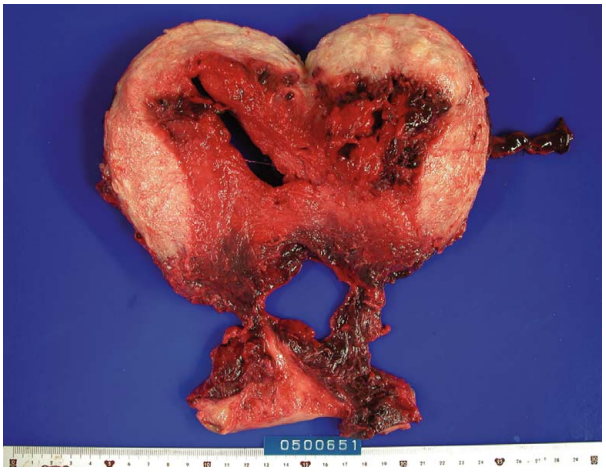

Figure 2. Irregularly thickened hemorrhagic plaques can be seen at the endometrium and myometrium over the posterior wall near fundus.

1 per 17,000–20,000 deliveries, including those ruptured traumatically and spontaneously [4,6,7]. However, to the best of our knowledge, the risk of unscarred uterine rupture using misoprostol during the second trimester is still unknown.

Misoprostol is an effective agent for induction of labor in full term pregnancies. Generally, the uterus becomes more sensitive to uterotonic agents, such as misoprostol, with the increase of gestational age, especially at term. Misoprostol given early in the second trimester may not be as effective as the same dose of misoprostol given late in the third trimester. Therefore, the misoprostol dosage in the second trimester may be expected to be higher than that at term; thus, misoprostol might increase the risk of uterine rupture. In our case, the most probable cause of rupture of the unscarred uterus seems to be the use of misoprostol in the second trimester. However, according to previous studies, the frequency of uterine rupture with intravaginal misoprostol is not increased at term or in the second trimester [8–13]. Moreover, the optimal dose and dosage interval of misoprostol for termination in the second trimester are still unknown. Further studies are needed to clarify the relationship between misoprostol use and rupture of an unscarred uterine and also to determine the optimal dose and dosage interval of misoprostol in the second trimester.

One study showed that the rupture site mostly involved in the uterus was the lower segment, constituting 92.6% of ruptures in the unscarred group and 92.3% in the scarred uterus group [14–16]. The underlying mechanism of a uterine rupture is probably caused by distention and elongation of the uterine muscle fibers, leading to the reduced thickness in the lower segment. The thin and soft uterine muscles in the lower segment are vulnerable to the increased intrauterine pressure, and thus, uterine rupture may occur eventually [17].

In conclusion, uterine rupture can occur in the second trimester when misoprostol is used, even in patients without a uterine scar. Obstetricians should always keep in mind the rare possibility of misoprostol-induced unscarred uterine rupture in the second trimester. Although the optimal dose and prescription interval of misoprostol in the second trimester is still unknown, the minimal effective dose should be considered on a case-by-case basis. Once a rare event of uterine rupture occurs, the patient should be transferred to a nearby medical center for emergency operation and volume replacement therapy as soon as possible. As for the treatment, just like in our case, primary suture of the ruptured uterus wound may be tried initially. However, primary suture of the uterine rupture was abandoned as the bleeding could not be controlled. Therefore, total abdominal hysterectomy should be undertaken to control bleeding and reverse the hypovolemic shock in time. We believe our experience in this case should be valuable in alerting others of the rare possibility of an unscarred uterine rupture when misoprostol is used during the second trimester.

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