Recurrent uterine rupture in pregnancy after pelvic surgery

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ABSTRACT

Uterine rupture is a rare but life-threatening complication, for both the mother and the fetus. This event is usually linked to the presence of uterine scars which in the past were mainly caused by cesarean section surgery. Today the number of uterine surgeries has significantly increased and rupture events are now principally connected with laparoscopic myomectomy. We report the case of a patient with recurrent uterine rupture: the events occurred in two consecutive pregnancies. Years earlier, the woman had undergone laparoscopic myomectomy for removal of a single intramural myoma node. The first rupture event was an asymptomatic wall dehiscence discovered during an elective cesarean delivery for fetal breech presentation. The second happened during the third trimester of pregnancy and presented as a real emergency: in that case the patient suffered a complete uterine rupture and on ultrasound scan fetal parts were observed outside the uterine cavity in the abdomen.

KEYWORDS

Uterine rupture, laparoscopic myomectomy, uterine scars, pregnancy.

Introduction

Uterine rupture in pregnancy is a rare complication with a high risk of maternal-fetal morbidity and mortality. Its incidence is strongly influenced by the presence of surgical scars [1,2].

Spontaneous rupture events may occur in cases of obstructed labor, multi-twin pregnancy, abnormal presentation of the fetus and in women with high parity. However, these events are extremely rare complications (0.006-0.2%) described mainly in geographical areas where obstetric care is not always guaranteed and the possibility of obtaining an emergency cesarean section is limited [3-6].

On the other hand, the presence of post-surgical scar areas in the uterus is associated with an up to 1% increase in the risk of uterine rupture. For decades, uterine scars were mainly the result of previous caesarean section surgeries.

However, in the recent years, the scenario has changed somewhat, for several reasons: reduction of parity and a tendency to repeat caesarean section surgery in patients who have previously undergone this procedure. As a result of this, the overall rate of uterine rupture in the cesarean scar area has been significantly reduced. On the other hand, the number of uterine surgeries (i.e. to treat fibromatosis, polyps, septum, infertility) has increased dramatically, and so too, therefore, has uterine rupture secondary to these types of surgery, which also cause uterine scarring. Conservative myomectomy performed by laparoscopy is the most frequent of these uterine surgeries. This type of surgery, together with other interventions such as salpingectomy with corneal resection or pelvic adhesiolysis in patients suffering from deep endometriosis, can lead to a weakening of the uterine wall that occasionally leads to organ rupture, as is well documented in the literature [2,8,9].

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Case Report

A 29-year-old woman in good health underwent laparoscopic conservative myomectomy: at the introduction of optics the uterus was increased in size due to the presence of a left postero-lateral intramural myoma node of about 6 cm in diameter. After removal of the node, hemostasis of the uterine wall with bipolar current and hemostatic suture with several detached stitches points was performed. The postoperative course was regular and the patient was discharged two days after the surgery.

At the age of 31, two years after the above surgery, the woman became pregnant spontaneously. The pregnancy proceeded physiologically without detection, on ultrasound, of any abnormalities of the fetus, placenta or uterus. Due to breech presentation of the fetus, an elective cesarean section was performed at 39 + 0 weeks of amenorrhea. At the time of hospitalization, the patient was in perfect general condition and showed no uterine contractile activity. On examination at ad-

mission, the abdomen was palpable and not painful; the uterus was correctly developed and the cervix completely conserved. On opening of the abdomen, a hole of about 5 cm was found at the uterine fundus through which placenta had spilled into the abdomen. After the placental removal, a double-layer suture with detached stitches was performed to repair the uterine wall. The fetus was a female with a birth weight of 2850 g, and no signs of distress. Cord blood analysis showed pH 7.24, base excess (BE) -3.9 mmol/L for the umbilical artery and pH 7.30, BE -2.4 mmol/L for the umbilical vein. The Apgar score at 1' and 5' was 9.

Three years after the previous pregnancy and five years after the first surgery, the woman, now 34 years of age, became spontaneously pregnant again. At 31 + 0 weeks of amenorrhea, she was admitted to the Obstetric Emergency Room for abdominal pain, mainly reported in the left hip, in the absence of blood loss or drain of amniotic fluid. On transabdominal ultrasound, a single cephalic fetus with heartbeat and active movements was found but also fetal parts outside the uterine cavity in the abdomen (Figure 1). The amniotic sac was apparently intact and the placenta was attached to the posterior wall of the uterus. The patient underwent an emergency cesarean section with fetal extraction after around 7 minutes from the diagnosis. A hole of about 4 cm at the uterine fundus was found (Figure 2) and closed with double-layer suture with detached stitches and additional haemostatic reinforcement stitches. The fetus was a female with birth weight of 1040 g, cord blood analysis was pH 7.33, BE -1.2mmol/L for the umbilical artery and pH 7.37, BE -3.4 mmol/L for the umbilical vein. The Apgar score at 5' was 8.

Figure 1 Ultrasound image of the fetal foot (star) outside the uterus.

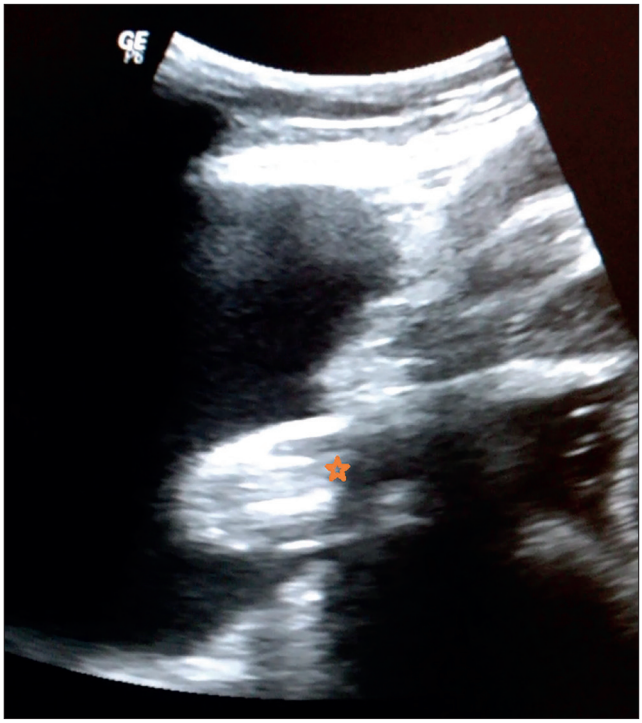

Figure 2 The uterine rupture observed during cesarean section.

Discussion

Leiomyomas are benign solid neoformations that affect about 20-40% of women during their fertile years [10]. Uterine leiomyomas can impair reproduction capacity, so about 50% of patients become pregnant following removal of this type of tumor [11].

Currently, laparoscopic conservative myomectomy is a valid alternative to the open procedure because laparoscopy is associated with less intraoperative bleeding, less postoperative pain and therefore with faster recovery. From the reproductive point of view, the outcomes of these two techniques in terms of fertility are overlapping, both in terms of pregnancies and spontaneous abortions, but laparoscopy significantly reduces the formation of post-operative adhesions, which can constitute an additional obstacle in patients seeking a pregnancy [12-14]. Finally, trying a vaginal birth after laparoscopic myomectomy is not less safe and practicable in comparison to patients with a previous cesarean section [2,14].

However, recent reviews of the literature have shown that laparoscopic myomectomy is associated with a greater risk of uterine rupture in pregnancy compared with the open approach (1.2% versus 0.4%). This could be due to technical difficulty suturing the uterine breach and obtaining appropriate restoration of the parietal integrity [15,16]. Indeed, the rate of this complication is underestimated due to the high rate of elective cesarean sections in patients with a history of laparoscopic myomectomy. In the literature, dehiscences repaired during cesarean section are reported more frequently after laparoscopic myomectomy [17,18].

Risk factors

The number (>3), size (>5 cm) and site (intraligamentous) of myomas are connected with a major risk of surgical complications, such as bleeding or ureteral lesions, but they are not

predictive of uterine rupture [15]. Other authors indicated deep intramural location and endometrial cavity exposure as potential risk factors, therefore cesarean delivery is recommended in cases where more than 50% of the uterine wall is surgically demolished because the integrity of this organ depends on the maintenance of uterine muscle thickness; however, uterine rupture is described frequently after subserosal or pedunculate myoma removal [17,19].

The surgical suturing technique is probably the most important factor influencing the risk of uterine rupture: double-layer suture with reinforcement in the form of detached stitches is indicated by the authors as the most useful to restore wall integrity and resistance [12,15,19]. Instead the use of electrosurgery must be limited because coagulation with bipolar current induces thermal damage of the myometrium that causes tissue devascularization and replacement with connective tissue which cannot remodel during pregnancy [8,20].

Another important aspect is the time between surgery and pregnancy: MRI, ultrasound and three-dimensional power-Doppler studies have shown that the myometrial reconstitution process is already complete three months after the surgery [21,22]. According to these findings, the minimum interval indicated is three months, although the authors recommend at least six months of contraception as a precaution [14]. However, it is currently not possible to identify a time range of absolute safety, so this interval must be personalized for each patient in relation to the number of myomas removed and their location; in fact, in the literature unfavorable uterine rupture events are described even several years after laparoscopic myomectomy [17].

Clinical presentation

The classical clinical triad described consists of alteration of fetal heart rate (FHR), abdominal pain and vaginal bleeding; however, only 9.1% of complete uterine rupture cases presents the three signs simultaneously. In particular, vaginal bleeding is usually minimal or absent compared with intrabdominal bleeding, which starts usually a subclinical complication and can cause finally a severe hemoperitoneum with hemodynamic instability [23,24].

The principal sign of uterine rupture is alteration of FHR, which can be the only manifestation of this obstetric adverse event; in particular, the most predictive cardiotocography modification is the appearance of late decelerations, even though these are poorly specific [6,23,25].

Unlike post-cesarean ruptures, which occur mainly during labor, most uterine rupture events after laparoscopic myomectomy happen during pregnancy, especially at the beginning of third trimester. For this reason, fetal outcomes are influenced both by post-rupture hemodynamic impairment and by fetal prematurity [2,14].

Conclusions

Laparoscopic myomectomy is an excellent alternative to the abdominal technique, offering benefits such as reduced invasiveness, adequate fertility outcomes and rarity of long-term complications, such as the risk of uterine rupture.

Using an adequate surgical technique, based on reduced use of diathermocoagulation and execution of a correct suture, and ensuring an adequate interval between surgery and pregnancy can reduce the risk of uterine rupture, which nevertheless remains an unpredictable event.

However, it is possible to improve maternal-fetal outcomes through timely cesarean section, allowed by early recognition of clinical signs of suspicion and by an adequate anamnesis that discloses a previous uterine surgery, such as a conservative myomectomy, or even a previous rupture event.

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