

## “Masked uterine rupture”: key to diagnosis

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Dear Editor,

I read with interest the article, “Uterine perforation with omentum incarceration after dilatation and evacuation/curettage: magnetic resonance imaging findings” by Koshihara et al. [1]. Dilatation and evacuation caused uterine perforation, which remained undiagnosed for 28 days. The omentum was incarcerated and thus occluded the uterine perforation, which “masked” the perforation and also “masked” the symptoms and signs that usually accompany this condition. Thus, the perforation remained undiagnosed for a long time. Magnetic resonance imaging was useful to establish the diagnosis. Briefly describing our experience and reviewing previously reported cases, I hope to introduce a new concept, the “masked uterine rupture”. For simplicity, I have used the term “uterine rupture” to indicate both uterine rupture and perforation.

We recently had a pregnant patient with a uterine rupture: the rupture site was occluded by a loop of small intestine adherent at the site of perforation, which prevented early diagnosis. We previously described her clinical course in detail [2], and I briefly summarize the points here. A primiparous woman, not in labor, with a past history of myomectomy complained of mild lower abdominal pain at the 34th week with stable vital signs. Computed tomography revealed massive fluid accumulation in the abdominal cavity. Laparotomy revealed a uterine rupture at the site of the previous myomectomy. Interestingly, the small intestine, with adherent loops, tightly occluded the site of uterine rupture. Thus, the usual “cascade” of uterine

rupture did not occur: a cascade consisting of bleeding from the ruptured site, fetus expulsion through the rupture, cord trouble or uterine contractions with placental separation, and eventual fetal death. Occlusion of the rupture site explains the lack of severe pain and circulatory collapse typical in patients with uterine rupture. Intestinal adhesion at the site of rupture caused occlusion and thus “masked” the occurrence of symptoms. The mother and the baby were healthy.

Another type of “masked” uterine rupture may occur. I previously cited [3] two typical cases [4, 5] to highlight this. In these cases, fetal minor parts (leg(s)) were extruding from the rupture site, occluding the rupture and preventing the rupture cascade from proceeding. Emergent cesarean section resulted in healthy mothers and babies [4, 5]. Thus, while the rupture was occluded from “outside” the uterus in the former two cases [1, 2], it was occluded from “inside” in these latter two cases [4, 5].

There are strong similarities among these four cases [1, 2, 4, 5]. The symptoms (abdominal pain) were not severe and vital signs were maintained during the initial phase. Imaging studies (ultrasound, computed tomography, or magnetic resonance imaging) then established the diagnosis or at least led the physicians to perform a laparotomy. A significant number of patients with “masked” uterine rupture may have been unreported, when the diagnosis was not made before surgery. In some patients the rupture remained occluded depending on the rupture size or strength of the adhesion and thus catastrophe may have not occurred or at least was delayed, whereas in others the rupture progressed to the extent that the typical uterine rupture cascade progressed, leading to a catastrophic outcome.

The “masking from outside” of a ruptured organ is well recognized by physicians. For example, consider rupture of the appendix due to appendicitis. The omentum, peritoneum,

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or intestine migrate and adhere to the site. Thus, the rupture and associated infection/inflammation may remain localized. This is a fundamental host-defense mechanism, and has led to surgeons informally referring to the omentum as “the policeman of the abdomen”. The ability of the omentum to perform this service also is the basis of the non-operative management of selected patients with a perforated duodenal ulcer, who are successfully treated with nasogastric suction alone. Thus, masking of a perforation in a hollow organ is not specific to the uterus. However, obstetricians may not recall the fact that uterine rupture may be “masked” by surrounding tissues. Furthermore, they may rarely consider the phenomenon of “masking from inside”. Previous investigators did not touch on this aspect.

Since uterine rupture and perforation are possibly life threatening, physicians must consider this diagnosis, even when abdominal pain is mild and signs of circulatory collapse are lacking. Thus, I hope the expression “masked uterine rupture” makes physicians recall this condition, enabling them to establish an early diagnosis and help to avoid a catastrophe. The word “masked uterine rupture” may unmask the rupture. Patient anonymity was preserved and informed consent was obtained.

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