



Contents lists available at ScienceDirect

## International Journal of Surgery Case Reports

journal homepage: [www.casereports.com](http://www.casereports.com)

# Uterine necrosis following a combination of uterine compression sutures and vascular ligation during a postpartum hemorrhage: A case report

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## ARTICLE INFO

## Article history:

Received 11 March 2017

Received in revised form 1 July 2017

Accepted 3 July 2017

Available online 10 July 2017

## Keywords:

Uterine necrosis

Uterine compression sutures

Vascular ligation

Postpartum hemorrhage

B-Lynch

## ABSTRACT

**INTRODUCTION:** The Postpartum bleeding is the first cause of maternal mortality in Morocco. It is an obstetrical emergency that requires a fast multimodal management including medical care, interventional procedure and in few cases a salvatory surgery.

**CLINICAL CASE:** We report a rare case of uterine necrosis following postpartum hemorrhage, refractory to medical therapy, and which was controlled by a combination of uterine hemostatic techniques and vascular ligation three days after surgery, the patient developed a fever (39 °C).

At day 3 of postoperative period, the patient developed a fever (39 °C) associated with diffuse abdominal pain, diarrhea and non-fetid lochia. At day 5, she presented a state of sepsis. Abdominal and pelvic CT objectified gas bubbles in the uterine myometrium suggestive of necrosis. An exploratory laparotomy was performed. After adhesiolysis, exploration found a complete necrosis of the uterus

**DISCUSSION:** There are many surgical techniques for the management of postpartum bleeding, and hysterectomy remains the reference solution in this context. However, new conservative surgical techniques that are easier to perform and are less aggressive have emerged and are becoming more commonly used. **CONCLUSION:** We emphasize on the importance of choosing surgical techniques that lead to the preservation of uterine vascularization.

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## 1. Introduction

Postpartum bleeding is the primary cause of maternal mortality in Morocco [1]. It is an obstetrical emergency that requires fast multimodal management, including medical care, and, in few cases surgical intervention becomes inevitable.

In the last ten years, uterine compression techniques have been described and integrated into the therapeutic arsenal against postpartum bleeding. However, their evaluation in literature is still weak.

We report a rare case of uterine and ovarian total necrosis following a combination of uterine compression sutures and vascular ligation. We also emphasize on the importance of choosing surgical techniques that lead to the preservation of uterine vascularization.

The work in this case has been reported in line with the SCARE criteria [2].

## 2. Clinical case

We report the case of a 20-year-old pregnant patient, primiparous and without significant medical history. She presented by herself and was admitted to the delivery room of a gynecologic and obstetric community unit in early labor. The patient vaginally delivered a male newborn with a weight of 3900 g. Apgar, at birth, was 10 \ 10. Immediately following the delivery period, postpartum hemorrhage occurs due to uterine inertia. It was refractory to medical therapy including the usage of syntocinon, vascular perfusion and uterine massage, then 5cp of intra-rectal misoprostol (to unavailability of Sulprostone), Embolisation therapy is not available in our center. This condition lead to the decision to perform a salvage laparotomy with the realization of a triple stepwise suture but bleeding persists. The gynecologic obstetrician performed a uterine compression suture of the Cho type, using absorbable thread. The bleeding stopped, the patient was transfused with 5 red blood cells and 5 fresh frozen plasmas, then moved to our University hospital center.

On day 3 of the postoperative period, the patient developed a fever (39 °C) associated with diffuse abdominal pain, diarrhea and non fetid lochia. Blood count showed WRC at

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**Fig. 1.** Pelvic CT objectified gas bubbles in the uterine myometrium suggestive of necrosis.

22,000/mm<sup>3</sup>, Hb = 11,2 g/dl and CRP level at 203 mg/L. Abdominal and pelvic ultrasound showed heterogeneous myometrium with a low abundance intra-abdominal effusion. A broad-spectrum antibiotic was started (targeting an eventual endometritis extended to myometrium), without improvement. On day 5, she presented with sepsis. Abdominal and pelvic CT identified gas bubbles in the uterine myometrium suggestive of necrosis (Fig. 1).

An exploratory laparotomy was performed. After adhesiolysis, exploration found a complete necrosis of the uterus (Fig. 2). Ablation of the uterine compression sutures and vascular ligations was achieved with uterine warming. Necrosis was definitive. A total hysterectomy was performed, associated to a peritoneal lavage and drainage. Outcomes were uneventful, drainage was removed on day 6 and the patient discharged on 7.

The anatomopathology result of the surgical specimen confirmed the necrosis of the uterus.

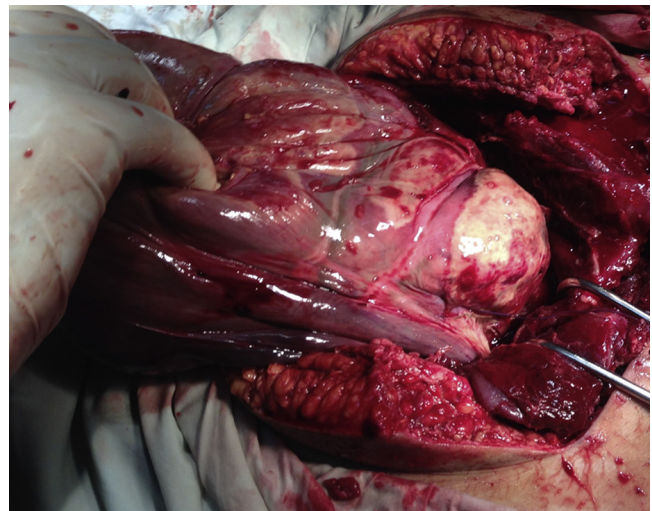
### 3. Discussion

The management of severe postpartum hemorrhage must be as fast, simple, and conservative as possible [3]. The first steps are always associated and concomitant. It is critical to ensure the uterus is empty, check the birth canal, and increase uterine contraction. A logical approach must be adopted in each obstetric unit defining a treatment protocol that is simple, effective, and reproducible in order to avoid hesitation and delay in management.

In case of medical or instrumental failure, the use of surgical procedures is recommended.

There are many surgical techniques for the management of postpartum bleeding, and hysterectomy remains the reference solution in this context. However, new conservative surgical techniques that are easier to perform and are less aggressive have emerged and are becoming more commonly used. These are:

- Distal vascular ligatures, which aim at the progressive and transient devascularization of the uterus
- Ligation of the hypogastric artery
- The uterine compression suture: which are more recent description. They are simple, quick and less aggressive. The authors use the first line, alone or in combination with previous techniques, but few cases have been reported [4].



**Fig. 2.** Bluish uterus with necrosis.

The aim of these measures is the compression of the placental bed as the source of bleeding. Several techniques are described in the literature, one of the best known:

- Ligation B-Lynch: practiced for the first time in 1989 by Christopher B-Lynch in a woman who refused hysterectomy hemostasis, during cesarean section, with an absorbable suture strength 1 or 2 and as long as possible, which is applied around the uterus as the straps of a backpack [5].
- Point Hayman: the principle is the same but two separate points are placed on the right and left over the fundus, the wire is passed through the anterior posterior isthmus.
- Suture of Cho (square sutures): Korean This technique has been presented by Cho JH which comprises applying together the anterior and posterior walls of the uterus by multipoint sutures transfixing frame.
- Point Pereira often cited that combines multiple sutures, vertical and horizontal sub serous transfixing [6].

Although these uterine compression techniques have been poorly evaluated, ease of implementation has allowed their rapid dissemination worldwide. As a result, some complications have occurred: pyrometry, erosion of the strap through the uterine wall, uterine ischemia, uterine necrosis, synechia. Nevertheless the frequency of such complications remains unclear given the absence of large reports in the literature regarding these procedures, but it could be 5–7% [7].

Rapid involution of the uterus postpartum certainly relieves the tension exerted by the points before resorption and the significant increase in the uterine vasculature and the development of a vast network anastomotic do make necrosis uterine unlikely [8]. Nevertheless, several factors may explain these variations of ischemia, such as the nature of the suture used (resorption time), the degree of the initial tension points, the proper placement of the compression points [9], and, finally, the combination with other hemostatic procedures resulting in a total interruption of the anastomotic network of the uterus, as was the case with our patient [10].

Thus, it appears that the technique of B-Lynch exerts a more uniform compression and not interrupting the parietal vascularization screen (no suture in the horizontal direction, only in the vertical direction) may reduce this risk, in contrast to frame issues [8].

Regarding the association of conservative surgical techniques, it remains little evaluate. the preference is to triple ligation distal

type Tsirulnikov supplemented if necessary by a B-Lynch, modified according to Hayman (closed womb) [11].

Imaging plays an important role in diagnosis. Ultrasound imaging is the first line as it shows a large uterus with a redesigned wall and a heterogeneous image is associated with the presence of air in the uterus. The use of CT is also often useful, as in our case, it revealed uterine necrosis with the presence of gas bubbles in the myometrium and in the endometrium and a lack of enhancement of the myometrium.

#### 4. Conclusion

Surgical techniques for uterine compression sutures play a major role in the therapeutic arsenal of postpartum hemorrhage during cesarean section. It allows, as a complement or alternative to vascular ligation, the preservation of the patient's fertility but it also requires maximum caution and monitoring for complications, the most serious of which is uterine necrosis. Refer to any table associating abdominal pain, fever and inflammatory syndrome after surgery.

#### Conflicts of interests

None of the authors have any disclosures or conflict of interests.

#### Funding

None.

#### Ethical approval

We have a consent by the patient. We have not submitted the case to the Ethics Committee approval.

#### Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying figures. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

#### Author contribution

Saad benkirane – Data collection, writing the paper.

Saadi Hanan and Ahmed Mimouni – Surgeon performing the operation. Data collection, writing the paper.

#### Guarantor

Saad Benkirane.

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