A new removable uterine compression by a brace suture in the management of severe postpartum hemorrhage

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INTRODUCTION

Postpartum hemorrhage (PPH) is a life-threatening complication of delivery. It is the leading cause of maternal death (1), with 1 to 13% of births around the world affected (2). In Morocco PPH was around 132/100,000 in 2009 were documented with PPH complication. It occurs in approximately 4% of vaginal deliveries and 6% of cesarean deliveries (3). Definition of PPH differs between authors; in general, it is a loss of more than 500 ml of blood after vaginal delivery or 1000 ml after cesarean section (2). Severity criteria are uncontrolled bleeding after initial medical management of PPH, hemodynamic instability even resuscitation by crystalloids and red blood cells, and presence of coagulation disturbances. Surgery is then indicated. It occurs in approximately 4% of vaginal deliveries and 6% of cesarean deliveries (3). Definition of PPH differs between authors; in general, it is a loss of more than 500 ml of blood after vaginal delivery or 1000 ml after cesarean section (2). Severi...
and compression of the uterus against the pubis (Figures 1–4). The throws are visible to the skin. Efficacy is immediately checked. Twenty-four to forty-eight hours later maximum, the throws are cut, and sutures are removed by simple wire traction without any anesthesia.

**POPULATION CHARACTERS**

Initially, the technique was used with 12 primiparous patients with severe PPH, defined as uncontrolled bleeding after initial uterotonically medical management, with hemodynamic instability even after resuscitation by crystalloids and red blood cells and after vascular ligature. The purpose was to prevent hysterectomy. Following the initial success, the technique was performed in 3 cases immediately after medical management failure.

**RESULTS**

In our 15 procedures, as described in Table 1, PPH occurred in 11 cases (73%) after vaginal delivery and in 4 cases (27%) after cesarean section. Eighty percent were caused by uterine atony. In 11 cases, the technique was realized secondarily after vascular ligature failure alone, and in 1 case after partial uterine resection for accret placental. One hundred percent of hemostasis was obtained; one (7%) secondary hysterectomy was done for bleeding relapse 3 h later. One death occurred secondary to preeclampsia with cerebral vascular accident. No particular complications were noted. During post-operative follow up, all patients regained their normal menstrual cycles. Five pregnancies were attempted, and three normal pregnancies were achieved.

**DISCUSSION**

We describe an innovative method, which is simple, effective, easy to learn, tried with successful outcome for the control of severe PPH as an alternative to more complicated surgeries like hysterectomy. This technique uses two mechanisms of bleeding control by compression of placental site by tight compression of uterine
Table 1 | Population characters and technique results.

|                  | n (%) |
|------------------|-------|
| Mean age         | 25 years |
| Primiparous      | 12 (80%) |
| Second parous    | 3 (20%) |
| Vaginal delivery | 11 (73%) |
| Cesarean section | 4 (27%) |
| Severe PPH       | 15 (100%) |
| Blood resuscitation | 15 (100%) |
| Hemodynamic instability | 15 (100%) |
| PPH etiology     |       |
| Uterine atony    | 12 (80%) |
| Accret placental | 2 (13%) |
| Uterine rupture  | 1 (7%) |
| Secondary hysterectomy | 1 (7%) |
| Maternal mortality | 1 (7%) |
| Mean time duration of procedure | 14 min |
| Blood loss       | 2300 ml +/− 500 ml |

walls and by obstruction of blood flow through uterine arteries by extreme forward flexion of the uterus.

Preventing uterine synechia is possible because uterine cavity is respected, there is no need to open the cavity by a new hysterotomy compared to original B-Lynch suture (+−8), and suture does not pass through the full thickness of both anterior and posterior uterus body wall compared to cho sutures (3), or to compressing U-sutures (1). Also it is known that inflammation around sutures and infection are responsible of synechia. So, the most innovative particularity of our technique is the removal of the suture 24 or 48 h later. This is the first time that a compressing uterine suture technique is followed by removal of the suture, and these three details may be the key of preventing synechia by decreasing the risk of infection. There is no foreign body inside the uterine cavity, and spontaneous cervical drainage is done after suture removal; hence, pyometra is avoided. Also, removing sutures prevents joining of endometrial walls over time, which itself increases the risk of infection.

CONCLUSION

Removable uterine brace compressive against pubis suture is a promising technique, simple, safe, and effective in management of severe PPH, adapted to most of PPH causes, from uterine atony to placenta accreta. It may prevent synechia and help maintain fertility by respecting uterine cavity and this more precisely by percutaneous removing of the suture 24–48 h later. We think that this technique deserves to be applied in greater number with added systematic hysteroscopy control to prove its superiority in synechia prevention.

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Conflict of Interest Statement: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Received: 26 July 2014; accepted: 20 October 2014; published online: 17 November 2014.

Citation: Aboulfalah A, Fakhir B, Ait Ben Kaddour Y, Aomoukhi H and Soummami A (2014) A new removable uterine compression by a brace suture in the management of severe postpartum hemorrhage. Front Surg. 1:43. doi: 10.3389/fsurg.2014.00043

This article was submitted to Obstetrics and Gynecology, a section of the journal Frontiers in Surgery.

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