

The strange case of a secondary postpartum hemorrhage caused by Bakri balloon expulsion

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Summary

A case of postpartum hemorrhage (PPH) faced by obstetric team according to international guidelines is reported. The maternal bleeding was caused by uterine atony and cervical laceration after a vaginal delivery. Uterine atony was managed by uterotonics and Bakri balloon along early skin to skin and breastfeeding. Cervical tear was sutured accordingly. The balloon was pushed out by strong uterine contractions causing mechanical dehiscence of the cervical suture and a new hemorrhage occurred. A new cervical suture was needed to stop the bleeding. Uterine tamponade with balloon is an effective tool to face uterine atony, but special care should be used if a deep cervical laceration is associated. The balloon can be pushed out by uterine contractions causing a new bleeding due to the mechanical dehiscence of the cervical suture.

Key words: Post-partum hemorrhage; Bakri balloon; Breastfeeding; Cervical laceration; Uterine atony.

Introduction

Postpartum hemorrhage (PPH) is the main preventable cause of maternal death worldwide [1], defined by blood loss of 500 mL or more in the 24 hours following childbirth [2]. In case of PPH, in order to avoid life-threatening consequences and to improve maternal survival, prompt and coordinated actions should be provided by obstetric teams [3]. Among the interventions for managing PPH, balloon tamponade is a highly effective tool, which is able to offer a threefold effect: compression of the placental bed, uterine contraction, and reduction in uterine blood flow [4]. In particular, in 1992 Bakri proposed a balloon device for control of obstetrical bleeding [5] and its use has been associated with a decreased rate of postpartum hysterectomy [6, 7]. Although the Bakri balloon is now utilized worldwide and its efficacy in achieving hemostasis for PPH widely recognized [8], several reports on complications related to the use of this tool have been reported [9-11].

The following report aims to highlight an unforeseen incident caused by Bakri balloon expulsion after a PPH, in a patient with cervical tear caused by a vaginal delivery.

Case Report

A healthy 23-years-old patient, gravida 1, at 41 weeks' gestation precipitously delivered a healthy female baby, weighing 3,150 grams (Apgar score 10 at first minute and 10 at fifth minute). The active management of the third stage of labor was

quickly carried out and oxytocin (10 international units (IU) in 500 ml of saline solution 0.9%) was administered. Nevertheless, profuse bleeding began due to uterine atony. The placenta was manually removed by physician while a bimanual uterine massage was performed. The on-shift midwife was solicited to call for assistance and promptly four midwives were able to obtain another vein access to administer crystalloids (1,000 ml) and colloids (500 ml). A blood sample was collected and the oxytocin amount infusion was increased to 15 IU. At the same time, the birth canal was inspected by physician to exclude additional bleeding sites. A uterine curettage was unable to find any placental or membranes remnants, while bleeding was observed from a complex, deep, longitudinal tear of the posterior wall of the cervix, about 5 cm in length. Blood loss also came from uterus due to persistent uterine atony. However, bonding and breastfeeding were supported nonetheless. By increasing uterotonic infusion and maintaining breastfeeding, uterine atony disappeared. Thus, the physician was able to apply stitches on the cervical tear, thereby controlling the bleeding. At this time, 0.2 mg of methylergometrine was administered intramuscularly. However, shortly afterwards, the uterus was poorly contracted once again and a new bleeding began. Therefore, an additional 15 IU of oxytocin (within 500 ml of 0.9% saline solution) was renewed and an intrauterine tamponade was performed applying the Bakri balloon (cuffed with 250 ml of fluid, until patient complained of uterine pain). To best manage the oozing from the cervical tear, vaginal packing with gauze was also applied, compressing the suture. A bladder catheter was inserted as well. The immediate intervention avoided a hemorrhagic shock, despite a blood loss of about 1,200 ml was estimated. As a consequence, the first assessment of blood tests did not demonstrate any coagulation impairment. The fibrinogen level was 398 mg/dl (n.v. 150–450 mg/dl), while hemoglobin level was 10.8 g/dl.

During the following hour, the patient was in good condition and was encouraged and supported to breastfeed. Urinary and

hemodynamic parameters were normal and uterus was strongly contracted; no blood was found on the gauze and bleeding was not observed from the drainage of the Bakri balloon. During the third hour after the birth, however, the patient complained of pelvic pain. The gauze was drenched with blood, while Bakri drainage was empty and the uterus continued to be contracted. Onset of disseminated intravascular coagulation was suspected. An arterial blood sample was collected before proceeding to surgically control of the bleeding; the hemoglobin level was 10.6 g/dl. Under general anesthesia, the gauze was removed in the operation theater. The obstetrician found an almost complete dehiscence of the cervical laceration, with profuse bleeding from the edges of tear, caused by the expulsion of the Bakri balloon, due to vigorous contractions of the uterus. Therefore, the balloon was removed and the suture on the cervix was performed once again, ending the blood loss. The coagulation state and hemoglobin levels of the patient were assessed during the following hours and days. Hemoglobin final level was 8.7 g/dl. The patient was discharged from hospital three days later in good health. No blood transfusions were needed. She continued to breastfeed.

Discussion

A singular case of cervical suture dehiscence caused by Bakri balloon expulsion after a PPH following vaginal delivery is described. To the best of the present authors' knowledge, this is the first case in which the application of Bakri balloon was the cause of a secondary PPH.

PPH was managed by the obstetrics team according to last released international guidelines [2, 3], by checking and treating of main causes, the so called four T's: tone, trauma, tissue, and thrombosis. Physicians should be aware that sometimes the bleeding could be provoked by more than one cause. Indeed, in the present case, the uterine atony and the cervical laceration were responsible at the same time for maternal bleeding.

The Bakri balloon was able to effectively control the bleeding due to uterine atony. In a technical report on Bakri balloon use provided by the Bakri producer [12, 13], it is not reported that lacerations contraindicate the use of intrauterine balloon if uterine atony is observed as well. Therefore, despite the correct use, the present authors had to face an unexpected complication. The balloon expulsion, due to uterine contractions, caused a mechanical dehiscence of the cervical suture, inducing a new bleeding which was initially suspected as disseminated intravascular coagulation onset.

Matsubara *et al.* previously reported balloon sliding due to uterine contraction. "Holding the cervix" and "fishing for the balloon shaft" techniques were proposed and described in order to avoid the expulsion of the balloon [14]. Indeed, after the Bakri balloon application, the uterus sometimes contracts, causing expulsion from the uterine cavity, but this temporary uterine contraction does not guarantee an effective long-lasting contractile state [15]. Moreover, these techniques seem to be able to effective in preventing acute recurrent uterine inversion

[16].

The present authors speculate that also early breastfeeding, which was maintained during PPH treatment, could have contributed to face maternal bleeding, causing a lasting uterine contraction. However, the importance and the immediate effect of skin-to-skin contact and breastfeeding was recently demonstrated in preventing and controlling PPH [17].

In conclusion, the authors can affirm that uterine tamponade with balloon is an effective tool to treat uterine atony, but special care should be taken if a deep cervical laceration is associated. The balloon can be expelled by uterine contractions causing new bleeding due to the mechanical dehiscence of the cervical suture.

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