

Method Stopping Atonic Bleeding From the Uterus after Childbirth Using Balloon Tamponade

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Abstract: In the article a comparative analysis of the effectiveness of stopping atonic bleeding from the uterus using the balloon tamponade method is shown.

Keywords: balloon tamponade, atonic bleeding, uterotonics, infusion, gestational age, supravaginal, vaginal trauma, patients.

Rationale. Intrauterine balloon tamponade using a self-assembled balloon system has shown promise in stopping postpartum hemorrhage, according to some publications. The collection components of the system are readily available, inexpensive, and resistant to blockage of the drainage channel by blood clots.

Postpartum hemorrhage (PPH) remains one of the leading causes of severe obstetric complications. Qualitative studies from developing countries indicate greater need (wide acceptance) and increasing use of self-assembled intrauterine balloon tamponade systems among professionals. More and more evidence is accumulating in favor of the effectiveness of such methods.

Although somewhat counter-intuitive, packing the uterus, or the placing of a device inside the uterus to apply outward pressure on the uterine walls, is commonly used. The haemostasis is thought to result from the direct hydrostatic pressure on the radial arteries exposed across the placental bed. Uterine packing with gauze has largely been replaced with devices such as the Bakri balloon, Rusch balloon, and EBB, Foley and condom catheters. Each appear to be effective in PPH secondary to uterine atony and are widely used. However, two randomised trials have shown the condom balloon catheter to worsen blood loss when used in low resource settings. It is presently unclear whether this failure was due to the improvised condom catheter used, or the setting. In the UK, the Bakri balloon is the most commonly used, due to its large balloon capacity of 500 ml, ease of use and the presence of a central drainage tube to prevent the build-up of blood and clots behind the inflated balloon. Observational studies have reported success rates of 80%. It is therefore recommended for the treatment of PPH refractory to medical interventions. The main concern with the use of uterine tamponade is the risk of infection. Prophylactic antibiotics are therefore recommended, either as a single dose or for 24–48 hours in high risk women.

In our study, we used a balloon tamponade system. This system is assembled from a Foley catheter, a condom and a sterile dressing used for vaginal tamponade. The use of this device in clinical practice was approved during a discussion with the participation of a team of specialists included in the local ethics committee at maternity complex No. 3 and the regional perinatal center.

Patients and methods. The study was carried out in maternity complex No. 3 as well as the regional perinatal center, which is the clinical base of the Department of Obstetrics and Gynecology, Pediatric Gynecology of BukhSMU. Between September 2020 and November 2022, a balloon tamponade system was installed in 10 postpartum women with postpartum hemorrhage.

The decision to install the system was made in cases of resistance to conservative and medicinal methods of stopping bleeding. In all patients, the shock index was more than 0.9, which indicated the presence of a hypovolemic state of varying degrees at various stages of care.

Conservative measures to stop bleeding included: general intensive care measures, administration of uterotonics (oxytocin, misoprostol, ergot alkaloids) and/or infusion of tranexamic acid.

Results. In all cases, singleton live births were observed. The average age of the patients was 26 ± 2.3 years, the gestational age at the time of birth ranged from 37.5 to 41.3 weeks. In all patients, childbirth was completed through the vaginal birth canal. Uterine atony was the most common indication for installation of a balloon tamponade system (seven patients); in three patients, the indication was traumatic lesions of the birth canal (ruptures of the upper third of the vagina).

In one postpartum woman with atonic bleeding, signs of the development of disseminated intravascular coagulation were recorded. In two cases, after stopping the bleeding, ultrasound scanning revealed the remains of placental tissue. Of 10 patients, effective bleeding control was observed in 9 (90%), one patient required supravaginal hysterectomy to stop bleeding.

Combination therapy with antibiotics was administered to all patients with the installed system within three days after the development of bleeding. Three patients required blood transfusions, and three of the 9 postpartum women (30%) developed further complications such as anemia. The duration of bleeding was 80-210 minutes (average 2.3 hours).

The volume of blood loss was assessed in all cases, its range varied between 630-2400 ml (average 1429.3 ± 854.6 ml).

Conclusions. The study indicates significant effectiveness (up to 90%) of a self-assembled balloon tamponade system for stopping postpartum hemorrhage of various etiologies, including uterine atony and high vaginal trauma. The system is simple, requires little preparation time for installation, and does not lead to blockage of the drainage channel with blood clots.

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