Intrauterine balloon tamponade as management of postpartum haemorrhage and prevention of haemorrhage related to low-lying placenta

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Summary

The aim of the present study was to evaluate the effectiveness of Bakri balloon in preventing and treating postpartum haemorrhage (PPH). Intrauterine Bakri balloon was used in a total of 16 patients with two different purposes: prophylactic placement of the balloon after cesarean section (CS) in six patients with low-lying placenta and therapeutic placement in ten patients with persistent bleeding from uterine atony, after spontaneous delivery, and administration of uterotonics. Intrauterine Bakri balloon was a successful approach in controlling and preventing PPH in all 16 patients. The median nadir hematocrit was 26.6% in six patients who underwent CS and 25.6% in ten patients with persistent bleeding after spontaneous delivery. The intrauterine balloon was in place for a duration of 24 hours. The median balloon infusion volume was 345 ml (range 250-455). No complications were reported. Bakri balloon tamponade was a useful measure in treating PPH unresponsive to pharmacological therapy in patients who delivered vaginally. Moreover, it was able to prevent persistent bleeding in patients who underwent CS for central placenta previa.

Key words: Postpartum bleeding; Uterine tamponade; Balloon technology; Fertility sparing.

Introduction

Postpartum haemorrhage (PPH) is often a sudden, life-threatening delivery complication. It is one of the leading causes of maternal morbidity and mortality [1, 2], responsible for 140,000 maternal deaths worldwide each year (one every four minutes) [3]. Recently, several guidelines regarding PPH management have been formulated. They involve a stepwise approach, with an escalation of intervention: from less-invasive methods, as uterine rubbing, and uterotonic agents, to more aggressive techniques such as peripartum hysterectomy. Actually, the UK survey revealed that, for those women who do not respond to a combination of uterotonic drugs, hysterectomy remained the most common surgical procedure [4]. Taking into account the serious problems related to surgical management of PPH as ulterior blood loss, life-threatening complications (shock, renal failure, and coagulopathy) and adverse effect on fertility, alternative measures have to be sought [5, 6].

Uterine tamponade was one of the principal methods of achieving haemostasis in case of PPH since 1856 (cotton gauze was usually used to pack the uterus) [7, 8]. Today, there is resurgence of the use of uterine tamponade as conservative option in treating PPH with balloon technology.

The aim of the present report was to evaluate the real effectiveness of Bakri balloon not only in treating PPH after vaginal delivery, but also in preventing excessive bleeding in patients with low-lying placenta who are candidates to elective cesarean section (CS).

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Materials and Methods

The present study was conducted at the University Department of Gynecology and Obstetrics of L'Aquila between January 2009 and December 2011. A first group of patients who underwent CS for central placenta previa, and a second group of patients who experienced persistent bleeding from uterine atony after spontaneous delivery were candidates for uterine balloon tamponade. In patients who had CS, Bakri balloon was placed immediately after manual removal of afterbirth. At the same time, they received oxytocin (20 U in 500 ml of normal saline) and ergometrine intramuscularly (0.25 mg). The application technique of the device was similar to the original one explained by Bakri *et al*. during CS: the distal end of the balloon shaft was passed through the cervical opening with an assistant pulling that end vaginally. The uterine incision was sutured before filling the balloon with saline solution. After completing CS procedure, a vaginal pack was applied around the balloon shaft. In patients with persistent postpartum bleeding, the initial pharmacological approach with high-dose oxytocin (40 U in 500 ml of normal saline) and intramuscular ergometrine has not achieved haemorrhagic control. In these patients, the balloon was placed inserting the proximal end through the cervical opening, followed by vaginal packing. The amount of saline instilled to inflate the balloon ranged from 250 ml to 455 ml, depending on the size and capacity of the uterus. In all cases the balloon was filled while visualizing the uterine response to increasing tamponade. All patients had an indwelling Foley catheter to monitor the urine output and a broad-spectrum antibiotic cover for prophylaxis. Patients were kept under constant surveillance with control of hemogram, arterial pressure, and cardiac frequency six and twelve hours after the placement of the balloon. The balloon was held for a duration of 24 hours. The authors considered the procedure to be successful if the bleeding was stopped after the balloon was inflated.

Results

Ten women had vaginal deliveries (three of them were primiparous) and six women had elective CS. Onset of the labour was spontaneous in seven cases and induced in three of ten vaginal deliveries. Elective CS was performed for central placenta previa in all six cases. The age of the patients ranged from 20 to 44 years (median 31.1). The median estimated blood loss was 512 ml (range 300-680) in the group of patients who had CS and 955 ml (range 600-1,500) in women who experienced PPH after vaginal delivery. The median nadir hematocrit was 26.6% in women who had elective CS (down from a pre-operative median hematocrit of 35%) and 25.6% after vaginal delivery (down from 30.5%). The balloon and the Foley catheter were removed after 24 hours. The median balloon infusion volume was 345 ml. All patients had spontaneous diuresis. No genital and/or urinary infections were observed. No patients were transfused and no complications were observed. In all 16 cases balloon tamponade was performed successfully, achieving haemostatis, minimizing ulterior blood loss, and avoiding the need of peripartum hysterectomy.

Discussion

The management of PPH involves a stepwise series of physical, pharmacological, and eventually surgical procedures to stop uterine bleeding [9]. Although hysterectomy is a definitive treatment, there is a growing desire to preserve fertility, particularly in young women [10]. Uterine tamponade is one of the earliest methods for the management of PPH [11]. With recent appearance of balloon technology, medical community still shows a renewed interest in uterine tamponade as a conservative approach to PPH. Currently, a variety of such balloons are available; in descending order of relative cost they include: the Sengstaken-Blakemore tube, the Bakri balloon, Rusch balloon, Foley catheters, and the condom catheter balloon. Bakri balloon has the advantage of easy application and at the same time, easy removal (without the problem of traumatic friction of endometrial, endocervical or vaginal surfaces). In this study the authors found that Bakri balloon tamponade was highly effective in the management of PPH unresponsive to standard pharmacological management. All ten cases of PPH after vaginal delivery were controlled with balloon tamponade. Moreover, Bakri balloon tamponade was an effective mean of prevention of severe postpartum bleeding in patients having elective CS for central placenta previa. The purpose of our study was to evaluate the possible use of Bakri balloon as a preventative method of postpartum haemorrhage in patients showing risk factor for PPH as central placenta previa. Despite the small size of the sample, this report denotes an encouraging result in using Bakri balloon tamponade both as conservative management of PPH and as a mean of prevention of obstetric haemorrhage in women at risk, with the consequent reduction of aggressive surgery and without adverse effects on fertility.

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