Use of the Bakri postpartum balloon in a patient with intractable pelvic floor hemorrhage

When other methods failed to stop postcesarean bleeding, physicians tried something new

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Massive pelvic floor hemorrhage is a potentially life-threatening condition associated with complicated obstetrical and gynecological procedures. Sometimes, the bleeding cannot be controlled by conventional methods. This report demonstrates the effectiveness of the Bakri balloon as a pelvic pressure pack for the control of intractable pelvic floor hemorrhage following cesarean section.

Key words: Bakri postpartum balloon, obstetric hemorrhage, pelvic packing, postpartum hemorrhage, umbrella packing

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Problem: dangerous complication

Massive pelvic floor hemorrhage is a potentially life-threatening condition associated with complicated obstetric and gynecologic procedures. Profuse bleeding from lateral pelvic floor veins or presacral veins can be encountered in various situations, such as during peripartum hysterectomy, placenta percreta, abdominal pregnancy, radical hysterectomy, and pelvic exenteration.[1,2] When adequate control of bleeding is delayed, a secondary coagulopathy can complicate the situation by impairing hemostasis, consequently contributing to more blood loss. Hemorrhages exacerbated by coagulopathy commonly arise from venous plexuses or large raw surfaces at the pelvic floor that cannot be managed by clipping, ligating, suturing, or applying hemostatic agents.[2]

Conventionally, this type of bleeding has been successfully controlled with abdominopelvic packing using Kerlex rolls (Kendall Co., Boston, MA) tied together in a bowel bag, the so-called pack and go back method, or with dry laparotomy pads, applied firmly to the bleeding sites.[3,4] These methods temporarily contain bleeding until adequate volume replacement and correction of the coagulation defect can be achieved. However, a major disadvantage of both is the need to repeat laparotomy for pack removal.

First detailed by Logothetopoulos in 1926, a transvaginal pack, known variously as the Logothetopoulos, umbrella, parachute, or mushroom pack, relies on pressure to control copious post-hysterectomy bleeding from pelvic floor venous plexuses and raw surfaces.[5] A sterile plastic bag filled with continuously tied gauze rolls is used to compress the bleeding sites against the underlying fascia, muscle, and bone. The pack is inserted into the pelvis through the abdomen so that the opening of the bag and the tip of the assembled gauze line can be extended through the vaginal introitus. To ensure the pack furnishes the needed pressure, the open end of the bag, together with the gauze tail, is tied to a 1 L intravenous fluid bag that hangs at the foot of the bed for traction. A collection of case reports indicates this technique is successful in 85% of obstetric cases and 100% of gynecological cases.[5-12] A major advantage is the ability to avoid a second laparotomy because the pack is removed vaginally.

Over the last decade, intrauterine placement of the Bakri postpartum balloon (Cook Medical Inc, Bloomington, IN) has been well accepted as a simple and effective measure for controlling intractable placental site bleeding after third-trimester delivery, second-trimester miscarriage, and cervical ectopic pregnancy.[13-15] A newly devised application allows the Bakri balloon to be used in place of umbrella packing for pelvic floor hemorrhage after cesarean delivery. This technique provides several benefits.

Our solution

A 43 year old woman, gravida 2, para 1, was at 36 weeks' gestation with a diagnosis of severe preeclampsia and fetal growth restriction. She underwent induction of labor using intravaginal misoprostol. In the early latent phase of labor, emergency cesarean section was performed because of a worrisome fetal heart rate pattern. The baby weighed 4 lb 2.6 oz (1890 g) and had a 1 minute Apgar score of 5. After that, the placenta was removed uneventfully, and the uterus was exteriorized for better exposure of the lower segment.

Following repair of the uterine lower segment and bilateral tubal ligation, profuse bleeding from raw surfaces between the posterior uterine wall and the

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posterior cul-de-sac peritoneum overlying the lower sacrum was evident. It was thought to occur during exteriorization of the uterus when a dense adhesion obliterating the cul-de-sac was accidentally broken. Bleeding was aggravated by the increased vascularity of the gravid uterus and adjacent pelvic tissues.

An initial attempt to curb the bleeding by direct suture ligation and electrocoagulation of the affected areas was unsuccessful. A gynecological oncologist was summoned to the operating room for a hemostasis consult. Bilateral low and high uterine artery ligation was performed with satisfactory reduction of bleeding at the posterior uterine wall. However, the pelvic floor hemorrhage continued, even after more suturing and coagulation of the area. The bleeding appeared venous in origin and came from the large raw surface and friable tissues covering the pelvic floor (Figure 1).

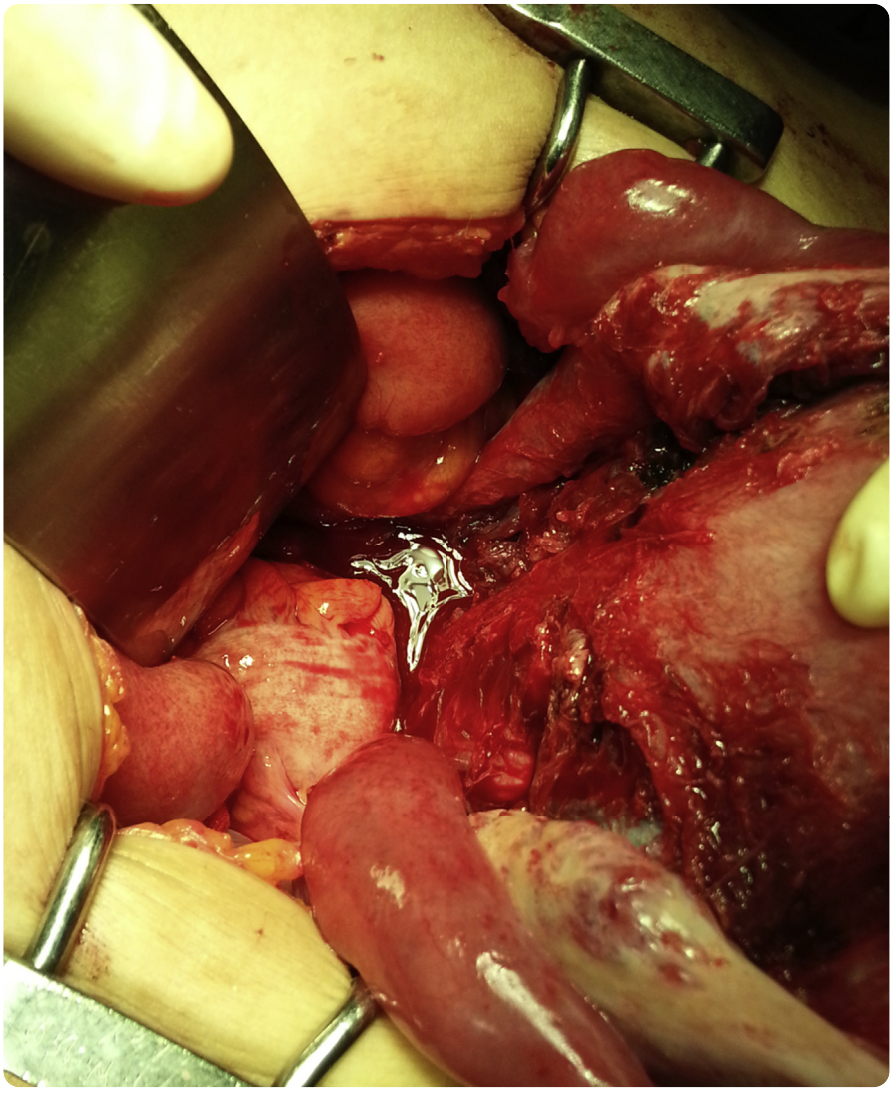
Manual direct compression with laparotomy pads was applied to the area for approximately 10 minutes to try to stem the bleeding. Yet as soon as the pressure was released, active bleeding resumed. From the surgeon's experience, it was apparent that any further surgical tactics to control bleeding would only lead to more tissue trauma, more blood loss, and prolonged surgery. Pelvic packing, which affords a longer period of compression, was determined to be a better choice because it would supply time for adequate volume replacement and correction of any coagulation defect were one to arise. It would also reduce the chance of having to perform another laparotomy to pack still-bleeding areas if coagulopathy did develop perioperatively.

Although an umbrella pack was a valid option, it was deemed too cumbersome because space in the pelvis was limited because of the presence of the uterus. Therefore, it was determined that the use of the Bakri balloon would be equally effective and more convenient.

The patient was placed in the dorsal lithotomy position. A sponge was situated in the posterior fornix with holding forceps and pushed upward to facilitate posterior culdotomy. Once all arterial bleeding had been contained, a posterior culdotomy incision, approximately 2.5 cm in size, was made. This was just large enough to accommodate the deflated balloon. The stopcock at the distal part of the inflation port was detached from the unit to facilitate placement. Then the Bakri balloon was introduced abdominally via the laparotomy incision and passed, inflation port first, through the posterior cul-de-sac opening to the vagina (Figure 2). Next, an assistant pulled the balloon's shaft through the vaginal canal. SURGICEL absorbable hemostats (Ethicon, Inc, Somerville, NJ) were set on the surgical base for additional hemostasis.

After the best tamponade position was determined, the stopcock was reattached to the end of the inflation port, and the balloon was gradually inflated with sterile normal saline (Figure 3). The goal was to fill the balloon to the minimal volume that could effectively compress the pelvic floor and completely control the bleeding. For this patient, given the anatomic location of the bleeding, that volume was judged to be 200 mL. The balloon was then firmly placed against the bleeding area in the pelvis (Figure 4). Continuous traction was applied by

FIGURE 1



Profuse bleeding came from the large raw surface and friable tissues overlying the pelvic floor.

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