Vaginal Hemorrhage From Transobturator Sling Controlled With QuikClot Combat Gauze

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ABSTRACT A 42-year-old woman underwent an outside-in transobturator sling procedure, with subsequent venous hemorrhage. Two rolls of Combat Gauze were placed intravaginally and taken out on postoperative day 2 with good hemostasis. Despite careful technique, hemorrhage is a known complication of midurethral slings. Advanced hemostatic dressings may provide hemorrhage control and avoid the need for surgical intervention. After an extensive literature review, we present the first case of QuikClot Combat Gauze used as a hemostatic agent due to vaginal hemorrhage.

CASE REPORT

A 42-year-old woman with stress urinary incontinence underwent a midurethral sling using an outside-in transobturator approach. The midurethral tunnels were bilaterally dissected in the direction of the obturator foramina. The left and right trocars were introduced and the sling adjusted per protocol. Steady brisk bleeding was then noted from the right dissection site.

Bleeding continued despite 20 minutes of direct pressure. Intraoperative complete blood count was obtained, showing a decrease in preoperative hemoglobin and hematocrit from 13 g/dL and 39% to 10 g/dL and 31%, respectively. Vascular surgery was consulted and suspected venous injury because of the nonpulsatile nature of the bleed. Standard gauze vaginal packing was also unsuccessful in controlling the hemorrhage. Combat Gauze was placed into the extravaginal/extraperitoneal and vaginal spaces and successfully controlled hemorrhage after 10 minutes of direct pressure (Figs. 1 and 2). Computed tomography (CT) scan of the abdomen and pelvis did not show extravasation of blood into the retroperitoneal space (Figs. 1 and 2). On postoperative day 1, repeat hemoglobin and hematocrit increased to 12 g/dL and 34%. Then on postoperative day 2, the vaginal packing was removed and vaginal mucosa was closed with sling placement noted to be in the correct position.

The patient returned for postoperative assessment and was satisfied with the operative result. To our knowledge, this was the first case for which QuikClot Combat Gauze has been used intravaginally for the control of hemorrhage.

COMMENT

The midurethral sling has been shown to be effective in the treatment of female stress urinary incontinence. Complications mentioned in most literature, more common with the retropubic approach because of structures located within the Space of Retzius, are bladder perforation, urethral invasion, vaginal erosion, postoperative bladder retention, pain, and hematoma.[1] Several reports fail to show any significant bleeding from the transobturator approach.[2–4] Despite the evidence on the safety of a transobturator approach, significant bleeding or vessel injury is a possibility.

It is believed the transobturator approach offers an alternative method with lower risk compared to the retropubic counterpart. Some evidence even suggests that bleeding is significantly reduced with the transobturator approach. A randomized controlled trial indicated the rate of significant hematoma to be approximately 0.08% for the transobturator approach.[5] However, significant bleeding has been reported with use of the transobturator technique.[4–6]

In our case, it was believed the trocar was placed in close vicinity to an accessory obturator vessel causing injury. A study conducted in 2004 showed accessory vessels to exist approximately 1.1 cm from the sling, with some vessels within less than 1 cm.[7] Venous injury was suspected as a result of a nonpulsatile bleed along with evidence from cadaver studies. These studies have shown the medial to lateral orientations of the obturator nerve, artery, and vein are variable depending on the location these structures enter the obturator canal. The vein appeared most medially in 78% of cadavers and the artery in 22%, with branches of these vessels traversing medially across the obturator membrane toward the side of trocar placement.[8]

Hemorrhage remains the primary cause of preventable death after both civilian and military traumatic injury.[9] Temporary hemorrhage control may be obtained through direct pressure, tourniquet placement, or application of a gauze pressure dressing. Over the past decade, there have been multiple advanced hemostatic dressings developed that have been shown to be significantly superior to standard gauze dressings in providing hemorrhage control. These dressings are crucial in their ability to control initial hemorrhage so that transfer to a higher level of care can occur, thereby potentially improving survival.[9] Although initially developed for use in major extremity wounds, there is a growing body of research and clinical

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All authors work in a military facility. None of the authors have a conflict of interest.

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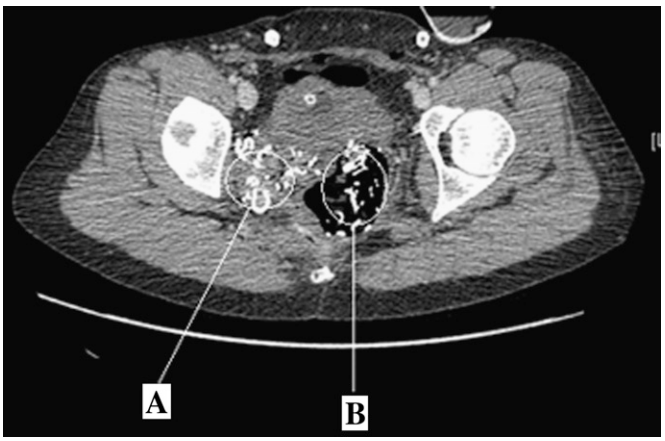

FIGURE 1. CT Abdomen/Pelvis—Transverse section with Combat Gauze identified in the (A) extravaginal space and (B) vagina. No evidence of retroperitoneal bleed is evident.

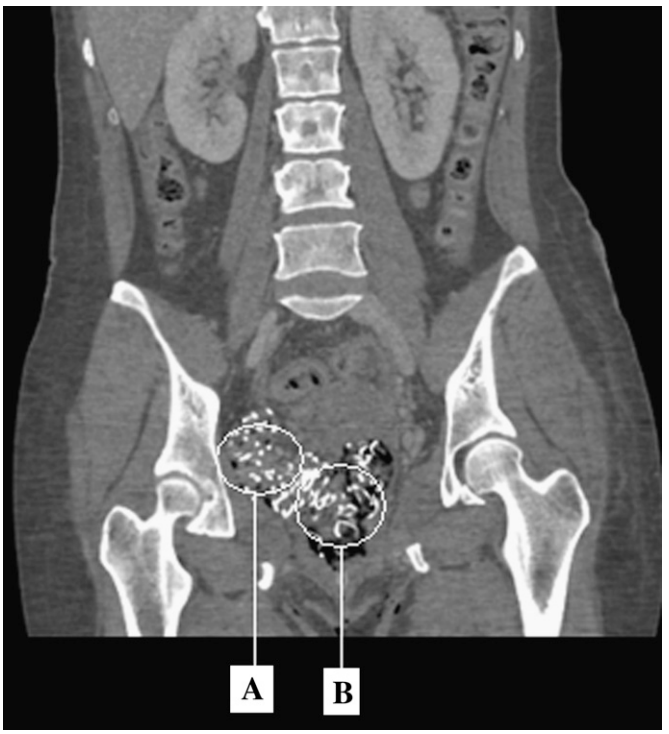

FIGURE 2. CT Abdomen/Pelvis—Coronal section with Combat Gauze identified in the (A) extravaginal space and (B) vagina. No evidence of retroperitoneal bleed is evident.

experience utilizing these products in thoracic, abdominal, and pelvic cavitary surgery complicated by major hemorrhage.

Combat Gauze combines surgical gauze with an inorganic material, kaolin which is rich in aluminosilicate nanoparticles, that stops arterial and venous bleeding. Unlike the powder, QuikClot, it creates no heat, is inert and nonallergenic. These nanoparticles quickly reduce bleeding by absorbing water, causing blood in a wound to concentrate and clot quickly. As this product is identical to a standard gauze roll in size and handling, it requires no additional training or familiarity to be used effectively by surgeons.

An additional advantage of the Combat Gauze is its ability to conform and fit to a wide variety of wound shapes and depths. This is of benefit in minimally invasive cases, such as this one, where adequate exposure and direct hemorrhage control is often not possible without significant extension of the surgical incision and major pelvic vascular dissection, resulting in a high risk of associated morbidity. It also provides an excellent option in cases where surgical exposure and obtaining adequate vascular control in the deep pelvis or retroperitoneal space is difficult even with an adequate incision.

Control of major hemorrhage during a transobturator sling procedure may be extremely difficult because of the difficult anatomic location of the injured vessels, limited exposure, and visualization provided by the small incision. Advanced hemostatic dressings such as Combat Gauze offer an additional option for the surgeon to utilize and may provide temporary or even definitive hemorrhage control with major vascular injuries.

To our knowledge, this is the first published report for the use of Combat Gauze to control massive hemorrhage from a minimally invasive sling procedure. Additional laboratory and clinical studies of these products for hemorrhage control during abdominal and pelvic surgery are warranted to clarify their limitations and optimal techniques for successful use. Of note, the authors do not have any affiliation with this product. However, it is available online if other facilities wish to purchase this product.

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