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Intrauterine Devices for the Management of Pph

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INTRODUCTION:

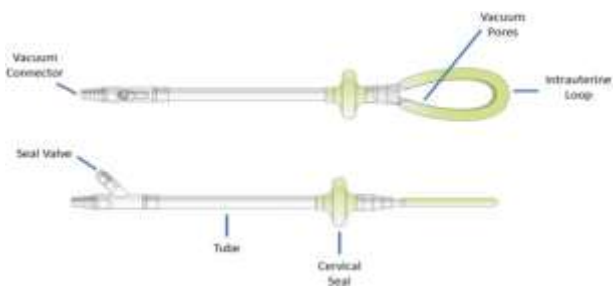
Postpartum hemorrhage (PPH) is a one of the most common and important obstetric emergencies that can follow vaginal or caesarean delivery. It is a common cause of maternal morbidity and mortality worldwide. According to WHO, PPH is defined as the amount of blood loss in excess of 500 mL following the birth of the baby. Currently used widely intrauterine devices in the management of PPH., which includes Jada system, Bakri Balloon Tamponade, Ellavi Balloon Tamponade, Suction Tube Uterine tamponade (STUT), and Postpartum butterfly. These devices offer a new mechanism for achieving hemorrhage control by mechanically restoring uterine tone.

Five intrauterine devices:

- JADA system
- Bakri Ballon Tamponade
- Ellavi Balloon Tamponade
- Suction Tube Uterine Tamponade
- PPH Butterfly

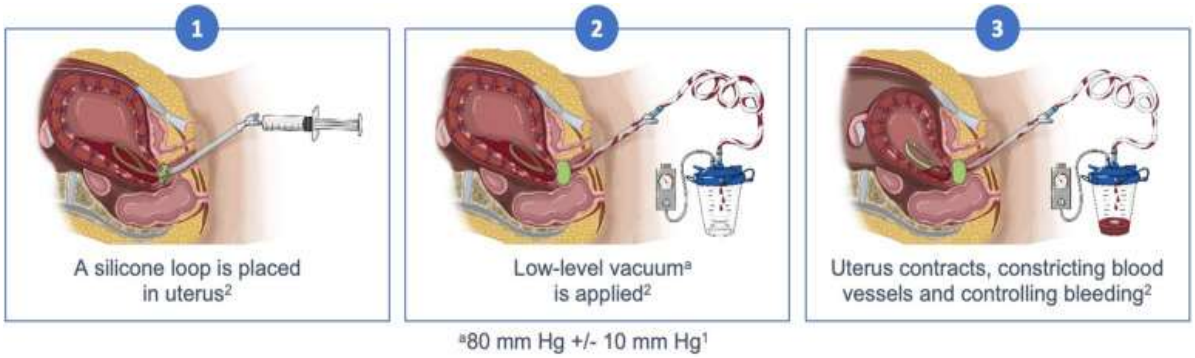
1. JADA system:

The Jada System is an intrauterine vacuum-induced haemorrhage-control device. Which is FDA-cleared in August 2020 and is commercially available in the US. This device is used for the control and treatment of abnormal postpartum uterine bleeding or haemorrhage. When conservative management is warranted. The Jada System is a 41 cm long intrauterine device made of silicone.



D'Alton. Vacuum Device for Postpartum Haemorrhage. Obstetric Gynaecological 2020.

Method:



Placement of intrauterine vacuum-induced haemorrhage-control device

The device is placed transvaginally and manually for all modes of delivery, with placement following hysterotomy. In the setting of a caesarean delivery, the device requires 3 cm cervical dilation at a minimum for transcervical placement. Once in place, 60–120 mL sterile fluid is filled to ensure a seal for vacuum. Before connecting, the vacuum is set to 80 mm Hg (±10 mm Hg). Once in place and connected, the provider can monitor uterine collapse either through transabdominal fundal palpation after a vaginal birth or after the abdomen is closed post caesarean or through direct observation at caesarean if the abdomen is still open. The evacuated blood is observed as it passes through the tubing into a graduated canister, and the intrauterine device remains in place for a minimum of 1.5 hours and 24 hours. During and after the therapy provider should monitor patient status, including vital signs, uterine tone, and blood loss.

Placement of intrauterine vacuum-induced haemorrhage-control device

Advantages: Advantages of the Jada system are Rapid and effective bleeding control, Conservative management, Ease of use, short treatment duration, FDA clearance, and is commercially available in the US, indicating its Safety and Effectiveness.

2. Bakri balloon tamponade:

UBT is a non-surgical method of treating postpartum haemorrhage. Bakri balloon tamponade is the most commonly used device for the management of PPH. It is made up of silicone. It is the first and best balloon device, initially described in the literature in 1999. Also, multiple alternative UBTs are commercially available, including the BT-Cath Balloon Tamponade Catheter and the ebb Complete Tamponade System. Use of a variety of improvised devices has also been described, including modified Condom catheters, Foley catheters, the Rusch balloon, and Sengstaken-Blakemore tubes.

Method:

An examination is first performed to assess for lacerations, retained products, or conception products, followed by a sweep of the uterine cavity with removal of any tissue or clot. A balloon is placed transvaginally, confirmed manually or via ultrasound. The balloon is then inflated with warm saline until resistance, and the device is securely affixed to the patient's leg to maintain tamponade. Maximum recommended volumes for the intrauterine balloon vary among devices, with the lowest volume Sengstaken-Blakemore balloon at 250 mL and the largest volume Rusch balloon at 1500 mL.

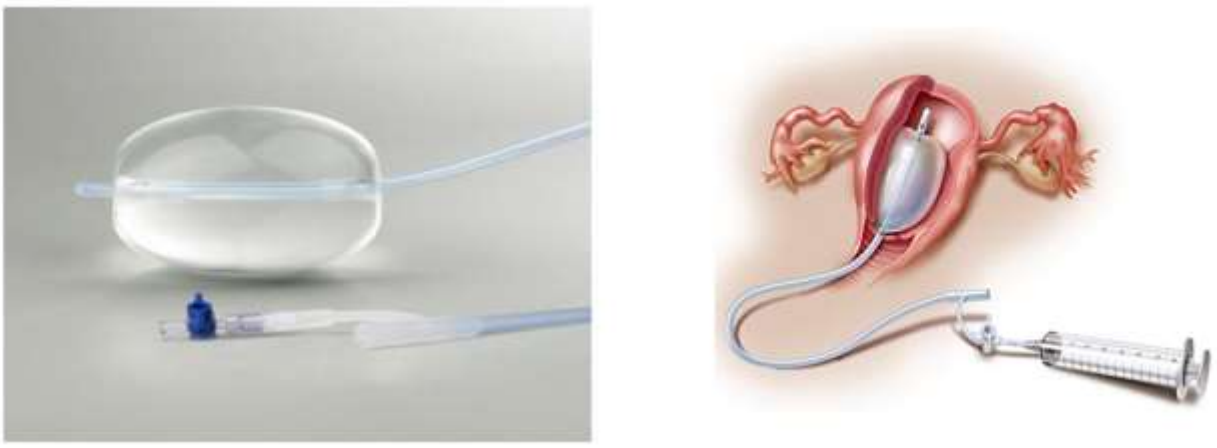


Figure 3: Bakri balloon tamponade

Advantages: Advantages of BBT are Rapid hemostasis, minimally invasive, Easy insertion, Avoidance of hysterectomy, Reduced blood loss, and time-saving method.

3. Ellavi balloon Tamponade:

Balloon Tamponade techniques have been used as second-line therapy for atony-related PPH before surgical intervention, typically with packing or a balloon filling the atonic uterine cavity to apply pressure to the bleeding myometrium. This device is a premade silicone balloon tamponade. It acts by exerting intrauterine pressure to counter postpartum hemorrhage from an atonic uterus.

Method:

The Ellavi balloon is inserted up until the fundus of the uterus and kept in this position. Then, fill the reservoir bag with water until it reaches the 1000 ml level. Open the stop cork to let the fluid flow into the balloon by the force of gravity, with the bag positioned higher than the balloon device. Once the patient experiences pain and evidence of stoppage of bleeding is noted, the stopcock is placed. To remove the device, deflate the balloon by placing the bag at a low level and opening the stopper. Water flows out, and bleeding is assessed.

Figure of Ellavi uterine balloon tamponade

Advantages: Advantages of EBT are Ease of use, Rapid action, Versatility, and Cost effectiveness.

4. Suction tube uterine tamponade (STUT):

It is an improvised device, requires manual stabilization while initiating vacuum. Levin's stomach tubing was most commonly used STUT.'

Figure of Suction tube uterine tamponade (STUT)

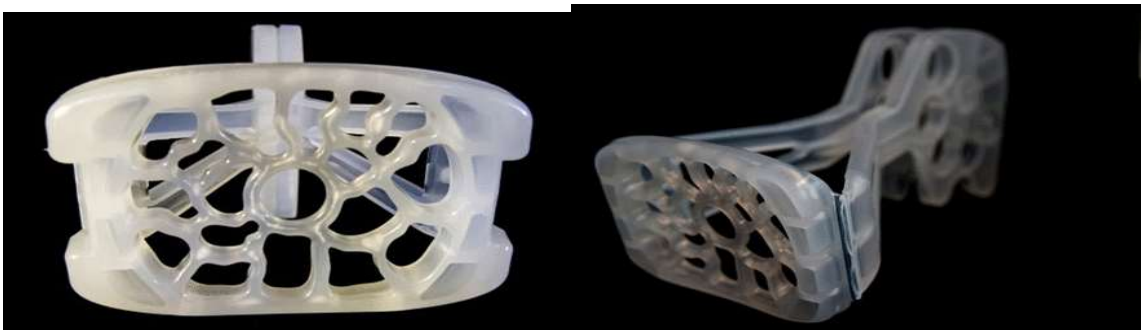
Method: The Levin suction tube is introduced manually into the uterine cavity until the proximal side hole is at least 5 cm beyond the cervix and is held in place while connected to external suction tubing. Then, initiated suction pressures of 100 to 200 mm Hg. If the suction is successful, continue for 1 hour. Also monitoring 20 minutes without suction before removal.

5. PPH Butterfly:

The PPH butterfly is a novel device designed to facilitate compression of the uterus of women experiencing PPH as an alternative to bimanual compression. It is also designed to work as a management tool that assists in the diagnosis of primary PPH. PPH Butterfly is a plastic-made medical device that replicates BMC. The surface of the device's platform resembles a grill, featuring multiple holes. This gives a surface against which to compress the uterus, while preventing the trapping of blood and clots above it. The size and shape of the compression platform were based on that of a shelf pessary; an intravaginal device used for treating uterine prolapse. It has been designed to be a slim, easily insertable replacement to a fist in the vagina, thus increasing acceptability of uterine compression to women and clinicians.

Method:

The method involves the device is folded flat for insertion, inserting a platform device into the vagina positioned beneath the uterus, and an external hand compressing the uterus against the device's platform. The device handle can be held by the clinician, and if bleeding stops with compression, the cause is likely uterine atony. If it continues, it may indicate genital tract trauma.



Figures of PPH Butterfly

Advantages: Advantages of the PPH butterfly are Early and precise diagnosis, a Low-cost device, minimizing trauma, and is Easy to use.

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