

# Vacuum Induced Intrauterine Tamponade for Postpartum Hemorrhage

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## Abstract

Postpartum hemorrhage, defined as a cumulative blood loss of 1,000 mL or more or blood loss associated with signs or symptoms of hypovolemia regardless of the route of delivery, is the leading cause of preventable maternal death worldwide. Postpartum hemorrhage is a main cause of maternal mortality worldwide, with rising incidence, thus demanding new treatment approaches. Although postpartum hemorrhage has multiple causes, the most common is uterine atony—when the uterus fails to adequately contract after childbirth—accounting for 70 - 80% of all postpartum hemorrhages.

There is a crucial need to expand treatment options for postpartum hemorrhage to address this global crisis. Over the last decade, the evolution of hemorrhage control devices has contributed to advancements in obstetrical hemorrhage management. The vacuum induced intrauterine tamponade are a promising new method. The number of existing hemorrhage control devices and techniques has increased markedly in recent years, and new devices are in development. The current evidence for established and investigational postpartum hemorrhage control devices has been summarized in this review.

**Keywords:** obstetrical hemorrhage, postpartum hemorrhage, uterine tamponade

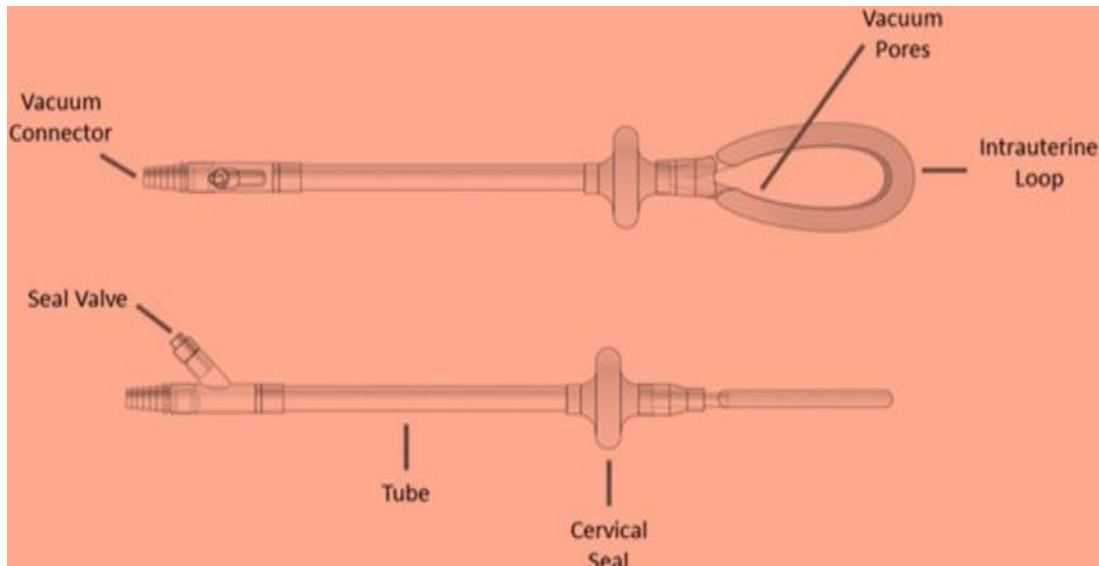
## The Jada System

The Jada System is now an FDA authorized medical device. The Jada System uses intrauterine vacuum to stimulate uterine contraction to stop bleeding, rather than putting internal pressure on the uterus like the balloon. The Jada System is a single-use device that has the potential to be an alternative to balloon tamponade.

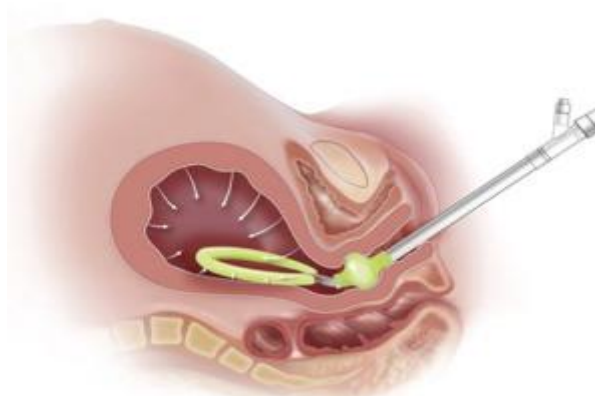
Multiple methods are often used together to manage the excessive bleeding. Fundal massage (manually massaging the uterus from inside and outside the abdomen) may be the first step in treatment. If this does not work, medications (e.g., oxytocin, ergonovine, carbetocin, misoprostol) are administered before initiating any more invasive therapies like surgery.

When physical manipulation and medications fail to control the hemorrhage, intrauterine interventions can be considered, such as uterine tamponade. Balloon tamponade is the current approach to uterine tamponade. Balloon tamponade is when a uterine balloon is placed within the uterus and inflated with sterile saline solution to put sustained pressure on the uterus from the inside. These balloons need to be used for 12 to 24 hours to slow or stop uterine hemorrhage. Surgical measures, such as uterine curettage, laceration repair, or hysterectomy, may be required if physical and drug therapies are unable to slow the bleeding.

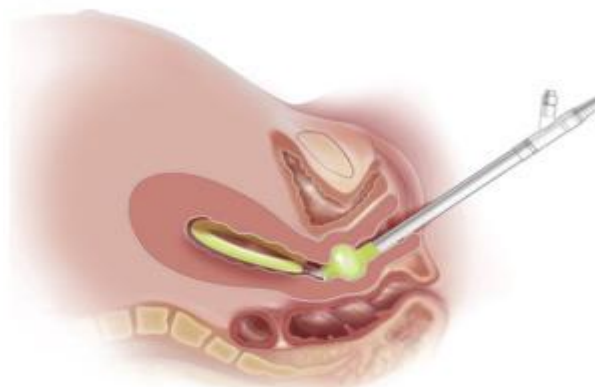
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**Fig.1 The intrauterine vacuum-induced hemorrhage-control device (The Jada System).**



**A) Placement of intrauterine vacuum-induced hemorrhage-control device with low-level vacuum connected.**



**B) uterine contraction**

**Fig.2**

### How It Works

The Jada System is a vacuum system used to control abnormal uterine bleeding or postpartum hemorrhage when conservative management is deemed appropriate. It is intended to be used to rapidly control postpartum hemorrhage caused by uterine atony that does not respond to drug therapy or when drug therapy is contraindicated.

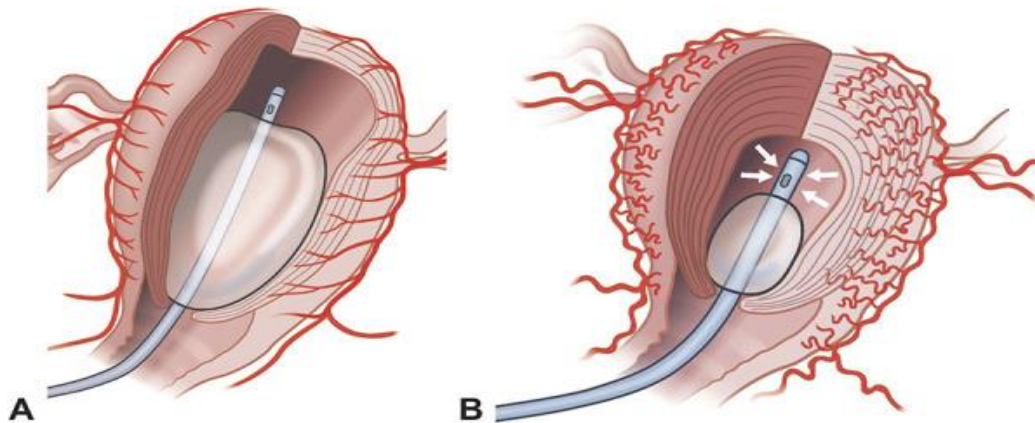
The device is made of silicone in the shape of a loop to be placed inside the uterus. The loop contains 20 vacuum pores, each 4 mm in diameter. There is a cervical seal that is placed at the external cervical os and filled with sterile fluid to limit the vacuum to the uterine cavity. The cervix must be dilated to at least 3 cm to allow for safe insertion of the device. Once in place, the device is connected to a regulated vacuum source and the suction begins.

The clinician is able to monitor the progress of uterine collapse through transabdominal palpation or direct observation in the case of a Caesarean section where the abdominal incision has not yet been closed. The amount of blood evacuated from the uterus can be monitored as it is collected in a graduated canister.

The amount of blood evacuated from the uterus can be monitored as it is collected in a graduated canister. The Jada System may be in place for a minimum of 1.5 hours, up to a maximum of 24 hours. The Jada System has not been evaluated for use in uteri less than 34 gestational weeks in size, patients with coagulopathy, or placenta accreta. If a patient is not responding well to the use of intrauterine vacuum tamponade, more aggressive treatments may be required.



**Fig:3 VACUUM - INDUCED INTRAUTERINE TAMPONADE**



**Fig:4**

- A) Schematic representation of a balloon filled with 500 mL of solution**  
**B) Balloon filled with 70 mL of solution applied intrauterine vacuum.**

### Advantages of Vacuum-Induced Intrauterine Tamponade

1. Unlike traditional balloon tamponade, which exerts internal pressure on the uterus, vacuum-induced tamponade uses suction to promote uterine contraction.
2. It is considered when conservative management is appropriate.
3. Success rates vary, but it provides an alternative to more invasive interventions like hysterectomy.
4. Vacuum-induced tamponade can be effective in controlling bleeding.
5. By promoting uterine contraction, it helps prevent further blood loss.

### Contraindications

- Cervical cancer.
- Purulent infections in the vagina, cervix or uterus.
- Postpartum vaginal bleeding unaccompanied by uterine bleeding
- Disseminated intravascular coagulation.
- Untreated uterine anomaly.
- Cases indicating hysterectomy.
- Pregnancy.
- A surgical site that would prohibit the device from effectively controlling the bleeding.

### Conclusion

Intrauterine vacuum-induced hemorrhage control may provide a new rapid and effective treatment option for abnormal postpartum uterine bleeding or postpartum hemorrhage, with the potential to prevent severe maternal morbidity and mortality. Given the speed with which the device has been demonstrated to control abnormal bleeding and postpartum hemorrhage, it is likely to offer benefit to the patient and family, the clinical team, and the health care system overall. This Article demonstrates that the intrauterine vacuum-induced hemorrhage-control device might fill an essential treatment need as we strive to decrease rates of severe maternal morbidity and mortality and improve maternal outcomes.