

Villalobos Technique of vascular ligation and uterine compression for the Management of Obstetric Hemorrhage

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Abstract

The Villalobos Technique of vascular ligation and uterine compression is an innovative surgical approach designed for the effective management of obstetric bleeding, particularly in cases of uterine atony and during transcesarean procedures. This technique combines ligation of the uterine arteries with a compressive suture, allowing rapid control of bleeding while preserving the function of the uterus and, therefore, the patient's fertility. The procedure is fast and safe, providing an effective alternative to hysterectomy in situations where conservative management of the uterus is required. Furthermore, its simplicity makes it applicable in resource-limited settings where access to advanced technology is scarce, making it a valuable tool for reducing maternal mortality in emergency obstetric settings. Through a series of clinical cases, the technique has demonstrated its ability to effectively stop obstetric hemorrhage and stabilize patients in critical situations. Its implementation can have a significant impact on reducing mortality and improving clinical outcomes, especially in second and third level hospitals.

Keywords: Villalobos technique, Obsteric Hemorrhage, Compressive Suture, uterine atony, hemorrhage control.

INTRODUCTION

Postpartum/peripartum hemorrhage (PPH) is an obstetric emergency that complicates 1-10% of all deliveries and is a leading cause of maternal mortality and morbidity worldwide, [1-4] with a total of approximately 140,000 deaths per year. secondary to loss of uterine tone have become a tool in the arsenal that the obstetrician faced with this complication is obliged to have. Christopher B -Lynch was the first to describe this technique in 1989 in a patient with obstetric hemorrhage. [5]

In some series, uterine artery ligation has shown a success rate of 80 to 96% in controlling uterine bleeding. [6]. They should be easily performed

quickly and safely, the most commonly approached vessels are the uterine arteries, ovarian arteries, round ligament arteries and internal iliac arteries. The widely used vascular ligation of the uterine arteries described by O'Leary is easy, fast and safe to stop bleeding in uterine atony during a laparotomy.^[7]

In this context, the "Villalobos Technique" combines ligation of the uterine artery with a compressive suture, achieving effective control of bleeding while preserving the patient's fertility.

JUSTIFICATION

The objective of this technique is to provide an effective surgical option to control bleeding in critical situations, such as uterine atony or trans cesarean hemorrhage, preserving the uterus and avoiding more invasive procedures such as hysterectomy.

DESCRIPTION OF THE TECHNIQUE

Prior to surgery, informed consent should be obtained from the patient, explaining in detail the procedure, its benefits, potential risks, and the available alternatives, including the possibility of a hysterectomy in case the technique fails to control bleeding. It will also be informed that the technique seeks to preserve fertility and the integrity of the uterus.

Before proceeding with the surgical technique, it is essential to remove the uterus from the pelvic cavity. This provides better visualization of the organ, allowing the surgeon to evaluate the vascular structures and ensure the correct application of the compression and ligation technique more clearly. This maneuver also facilitates access to the uterine arteries and the broad ligament, key elements in the success of the intervention.

1-gauge polyglactin 910 (Vicryl) suture is used, mounted on a 70 mm UR-6 curved needle, which is manually straightened to facilitate manipulation. The first suture is placed on the left side of the uterus, 3 cm from the uterine border and 3 cm from the inferior border of the hysterotomy. The needle is introduced from back to front, ensuring precise insertion. (figura 1 (A).

Figure 1 and 2 Villalobos technique of vascular ligation and uterine compression: description of steps by step

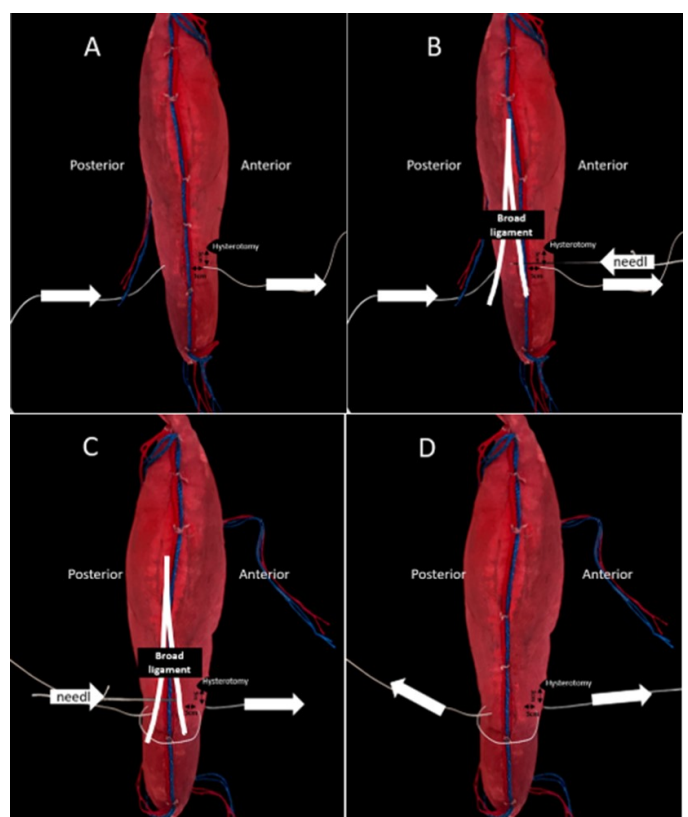


Figure 1: **A:** The needle is introduced from back to front, ensuring precise insertion. **B:** The needle is introduced through the avascular area of the broad ligament, carefully avoiding the major vascular structures. **C:** After passing through the broad ligament, the needle is reinserted 3.5 cm from the left uterine border, from back to front. **D:** Both ends of the suture are tractioned from medial to lateral ensuring adequate vascular compression.

Subsequently, the needle is introduced through the avascular area of the broad ligament, carefully

avoiding the major vascular structures. This part of the technique is crucial to minimize vascular complications and ensure that compression and ligation is performed without compromising other areas. (figure 1 (B)).

After passing through the broad ligament, the needle is reinserted 3.5 cm from the left uterine border, from back to front (Figure 1 (C)). Both ends of the suture are tractioned from medial to lateral ensuring adequate vascular compression (Figure 1 (D)). The suture strands are directed to the uterine body, maintaining firm pressure to stop blood flow (Figure 2 (E)).

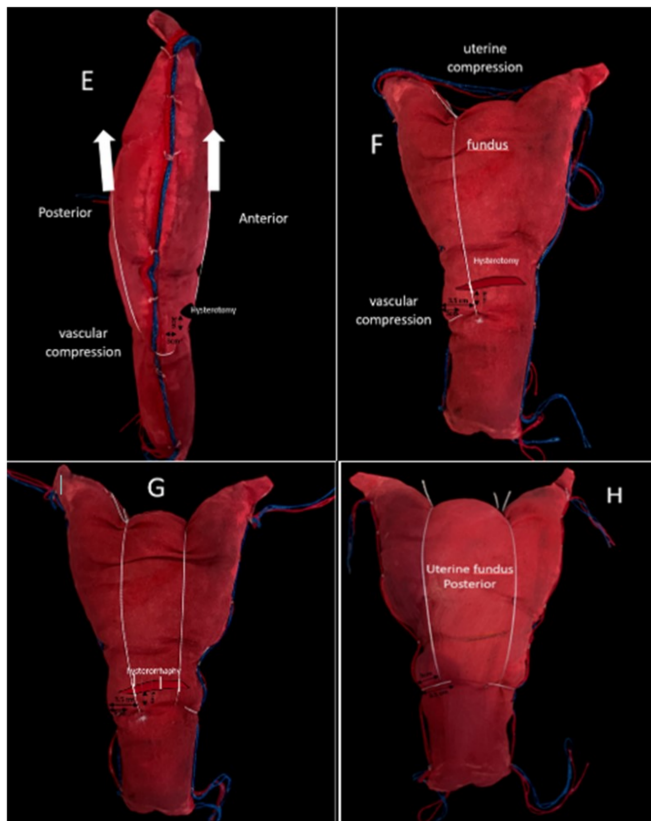


Figure 2: **E:** The suture strands are directed to the uterine body, maintaining firm pressure to stop blood flow. **F:** Once adequate compression has been obtained by the assistant in the uterus, the ends of the suture are firmly knotted. **G:** Villalobos technique of vascular ligation and uterine compression on both sides, showing the anterior aspect, the measurement lines are marked, with hysterotomy closure. **H:** Villalobos technique of vascular ligation and uterine compression on both sides, posterior aspect shown, measuring lines are marked.

Once adequate compression has been obtained by the assistant in the uterus, the ends of the suture are firmly knotted (Figure 2 (F, G, H)). This step ensures that the pressure exerted is sufficient to stop blood flow and compress the uterus (Figure 2 (G, H)). The procedure is repeated identically on the right side of the uterus to ensure effective bilateral compression. This ensures that blood flow to the uterus is completely controlled, thus achieving total hemostasis.

After controlling the bleeding, the hysterotomy is closed in one plane.

A meticulous review of the abdominal cavity is performed to verify that there is no residual bleeding or inadvertent damage to other structures. Hemostasis should be carefully checked before proceeding with abdominal wall closure.

INDICATIONS

1. Obstetric hemorrhage secondary to uterine atony.
2. Intraoperative hemorrhage during cesarean section.

EXPERIENCE

The four clinical cases described here demonstrate the success of the Villalobos Technique in the management of obstetric hemorrhage, particularly in critical situations of uterine atony. (See Table 1). The following highlights the key factors that explain the effectiveness of this technique, highlighting its ability to control bleeding and preserve the uterus, which is fundamental in obstetric care.

Table 1: Clinical cases treated with the Villalobos technique of vascular ligation and uterine compression.

Patient	Age	Diagnosis	Bleeding (ml)	Cause	Mode of birth	Manejo	Applied Technique
Patient 1	38	Placental abruption, pregnancy at 39 weeks gestation	800	Uterine atony	Cesarean section	Oxytocin, carbetocin	Villalobos technique of vascular ligation and uterine compression, achieving effective control of bleeding and preservation of uterine function.
Patient 2	30	Embarazo de 40 semanas, feto grande para edad gestacional, polihidramnios	400	Uterine atony	Cesarean section	Oxytocin, carbetocin	Villalobos technique of vascular ligation and uterine compression, with bleeding control and uterine stabilization.
Patient 3	32	Hemorragia trans cesárea por atonía uterina	750	Uterine atony	Cesarean section	Oxytocin, carbetocin	Villalobos technique of vascular ligation and uterine compression, with successful control of bleeding and uterine preservation.
Patient 4	29	Cesárea complicada con atonía uterina	600	Uterine atony	Cesarean section	Oxytocin,	Villalobos technique of vascular ligation and uterine compression applied during cesarean section, stopping the hemorrhage and stabilizing the patient.

The case of Patient 1, with a bleeding volume of 800 ml due to placental abruption at 39 weeks of gestation, is a clear example of the effectiveness of the technique. The placental abruption resulted in uterine atony, one of the main causes of obstetric hemorrhage. In this scenario, the Villalobos Technique allowed successful control of bleeding without resorting to hysterectomy, which preserved uterine function.

This result underlines the ability of the technique to stop bleeding effectively and safely, avoiding more radical interventions, such as hysterectomy, which could compromise the patient's fertility and future quality of life. The Villalobos Technique proved to be an invaluable tool for the control of bleeding in critical situations, preserving both the patient's life and reproductive function.

The Villalobos Technique combines two well-established approaches in obstetric surgery:

1. Ligation of the uterine arteries, which significantly reduces blood flow to the uterus, decreasing the amount of blood reaching the affected area.
2. The compressive suture acts mechanically to stabilize the uterus and ensure hemostasis by exerting direct pressure on the uterine wall.

Since the technique does not require specialized surgical equipment, it is especially useful in resource-limited settings where access to other more advanced methods or even blood products is scarce. This is a key factor in the success of the technique, since in many cases of obstetric hemorrhage in low-resource areas, options are limited and speed in controlling bleeding can make the difference between life and death.

DISCUSSION

The Villalobos Technique of vascular ligation and uterine compression has proven to be an effective surgical option for the management of obstetric hemorrhage, particularly in critical situations such as uterine atony and post cesarean hemorrhage. This technique combines ligation of the uterine arteries with a compressive suture, which allows rapid and effective control of bleeding without compromising the structure and functionality of the uterus, thus preserving the patient's fertility.

One of the most remarkable aspects of this technique is its applicability in low-resource settings, where access to more advanced technologies or treatments may be limited. As a relatively simple and quick surgical intervention, it is a valuable tool for obstetricians in emergency situations, contributing to the reduction of maternal mortality in cases of obstetric hemorrhage.

The clinical cases analyzed corroborate the success of the Villalobos Technique, both in the hemodynamic stabilization of the patients and in the preservation of the uterus. Its implementation as part of obstetric hemorrhage management protocols in second and third level hospitals could have a significant impact on improving maternal outcomes, providing an effective alternative to hysterectomy and allowing a faster and safer recovery for patients.

The Villalobos Technique offers an innovative, effective and easy to apply surgical solution, making it a preferred option for the conservative management of obstetric hemorrhage, with the potential to save lives and preserve patients' reproductive quality of life.

CONCLUSIONS

The Villalobos Technique of vascular ligation and uterine compression is an effective and conservative surgical intervention for the management of obstetric bleeding, especially in cases of uterine atony and during trans cesarean section procedures. It combines ligation of the uterine arteries with a compressive suture, allowing rapid and effective control of bleeding, while preserving the uterus and the patient's fertility.

The simplicity of the technique and its applicability in resource-limited settings make it a valuable option for reducing maternal mortality, avoiding the need for hysterectomy. This conservative surgical approach not only preserves the patient's reproductive capacity but is also feasible in second and third level hospitals, increasing its potential for widespread adoption.

In summary, the Villalobos Technique offers a safe and efficient solution for the management of obstetric hemorrhage, providing an effective method for preserving both the life and fertility of patients in any clinical setting, including those with limited resources.

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Conflicts of interest: None declared

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