

Short Communication

Hayman uterine compression stitch for arresting atonic postpartum hemorrhage: 5 years experience

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Abstract

Objectives: The present study was planned to access the efficacy of Hayman uterine compression stitch which is easy, can be applied faster and avoids the performance of a lower segment hysterotomy in patients with atonic postpartum hemorrhage.

Materials and Methods: It is a study carried out from January 2004 to December 2008 at a tertiary care center and included 48 women who had intractable atonic PPH not managed with medical treatment and who were wishing to preserve their fertility. Hayman stitch which is a simplified approach to uterine compression sutures was performed by tying two parallel vertical sutures from just above the bladder reflection to the fundus of the uterus.

Results: With Hayman stitch hysterectomy was avoided in 93.75% (45 out of the 48) patients with PPH. The postoperative course was uncomplicated, six women conceived spontaneously within 12 month after uterine compression suturing. Four delivered vaginally and two underwent cesarean section in view of fetal distress. The uterine cavity was found to be normal during caesarean section.

Conclusion: Two parallel vertical compression sutures (Hayman stitch) placed in the uterus controls bleeding effectively. The technique is easy, rapid and requires less skill and this simple procedure be tried first before other complex measures like uterine artery ligation are undertaken particularly for those obstetricians who lack sufficient training and skill.

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Introduction

Postpartum hemorrhage (PPH) is a major cause of maternal mortality worldwide ranging from 13% in developed countries to 34% in developing countries [1]. Uterine atony is the commonest cause for PPH that accounts for 80% of the cases. Although an assessment of risk factors is important, PPH typically occurs unpredictably and no parturient is exempt from the risk. When PPH continues despite aggressive medical treatment, early consideration should be given to surgical intervention to prevent the morbidity.

In recent decades, active attempts have been made to introduce conservative procedures to avoid hysterectomy. Within the past years, interest has surged in the surgical compression sutures for treating atonic PPH by exerting a mechanical compression on uterine vascular sinus without occluding the uterine arteries. Of the several different techniques, the B-lynch suture, first reported in 1997, has gained the most popularity [2].

Hayman stitch is a simplified approach to uterine compression sutures that involved slight modifications of the B-lynch technique [3]. This suture offers the advantages of being easier, can be applied faster, a key point in emergency situation, and avoids the need to perform a lower segment hysterotomy when PPH follows a vaginal delivery, therefore minimizing the trauma to the atonic bleeding uterus. We report our experience in the use of the Hayman stitch for the conservative surgical management of massive PPH.

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Methods

The study was carried out from January 2004 to December 2008 in the Department of Obstetrics & Gynecology at a tertiary care referral center. It is a retrospective study. All the women who were subjected to the Hayman stitch for atonic PPH were included in the study. The protocol followed at the hospital was that once atonic PPH was identified, the following measures were used initially to manage the bleeding, such as intravenous fluids, uterine massage, infusion of oxytocin (20 IU in 500 mL saline at rate of 125 mL/hr), injection of prostaglandin $F_{2\alpha}$ (250 mcg intramuscularly), and 800 mg of misoprostol in rectum after ruling out the contraindications along with arranging for blood transfusion. If these measures failed to control the hemorrhage, surgical intervention was initiated in the form of internal iliac artery or uterine artery ligation, Hayman uterine compression stitch, or hysterectomy. Facility for arterial embolization did not exist at the hospital. The patient was directly taken for hysterectomy, if she was hemodynamically unstable or in shock. In others who were hemodynamically stable and willing to preserve the fertility, conservative surgery was done in the form of internal iliac or uterine artery ligation or the Hayman stitch depending on the surgeon's experience. Only the 48 women who underwent Hayman stitch during this period were included in the study. The procedure for Hayman stitch was that the abdomen was opened, if not so as in cases following vaginal delivery and the uterus was exteriorized. Before applying the suture, bimanual uterine compression was done to check whether this stopped the bleeding. A number two chromic catgut suture on a straight needle was used to transfix the uterus from front to back, just above the reflection of the bladder, and was then tied above the fundus of the uterus, while an assistant applied bimanual compression. One more vertical suture was applied parallel to the first one (Fig. 1). In cases of PPH occurring after caesarean delivery, the lower transverse uterine incision was closed first. Before closing the abdomen, the surgeon ensured that the vaginal bleeding was normal. The postoperative course was monitored and women were followed 2 weeks after discharge from the hospital thereafter every 2 month for the first year and

then annually. Data about the surgical procedure and follow-up visits were analyzed.

Results

During the study period of 5 years, there were a total of 37,129 deliveries and 427 (1.15%) had atonic PPH severe enough to have a need of blood transfusion. Of 427 women, 106 underwent surgical intervention in the form of Hayman stitch (48), internal or uterine artery ligation (27), primary hysterectomy (31), and secondary hysterectomy (13) because of failure of either ligation procedure (10 women, 37.04%) or Hayman stitch (3 women, 6.25%). All the women who underwent surgical intervention needed at least two units of the blood transfusion.

On analyzing the data of 48 women, mean age was 22.56 ± 3.1 years and 37.50% were primipara. Thirteen women (27.08%) had PPH after vaginal delivery and 35 (72.92%) had PPH after lower segment caesarean section. In all the women, medical management of PPH was done as described in methods except in one woman where prostaglandin $F_{2\alpha}$ was not given as she had asthma. Of these 48 cases, three women continued to bleed after compression stitch and required hysterectomy for hemodynamic instability. Thus, with Hayman stitch, hysterectomy could be avoided in 93.75 % (45 of 48) women with PPH. The postoperative course was uncomplicated and the women had normal lochia and were discharged from the hospital in good conditions. Only 21 women came for follow-up in first year and 9 women in second year. There was no delay in resumption of normal menstruation following the cessation of breastfeeding. Six women conceived spontaneously within 12 month after uterine compression suturing and four delivered vaginally and two underwent caesarean section in view of fetal distress. The uterine cavity was found to be normal during caesarean section.

Discussion

PPH can cause exsanguinations rapid enough to be fatal despite immediate availability of blood products. One of the reasons for this could be the delay in resorting to surgical techniques once conservative measures have failed [4]. The traditional surgical techniques to achieve hemostasis include internal iliac artery ligation or caesarean hysterectomy. Hypogastric artery ligation is the most effective way to control hemorrhage while still preserving the uterus [5]. However, this surgical technique is difficult and requires a high degree of surgical skill and training and may be associated with ureteric injury [6]. In an emergency, there may not be an experienced surgeon on site to perform the ligation. Selective arterial embolization is another option of conserving uterus while managing PPH, if the woman is hemodynamically stable. Round the clock, availability of a skilled interventional radiologist and radiology setup in proximity is a prerequisite. The procedure has its own complications of postprocedure fever, uterine necrosis, vascular perforation, and infection [7].

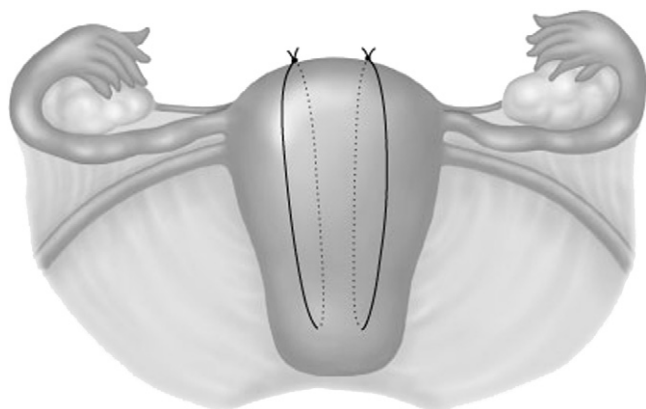


Fig. 1. Hayman uterine compression stitch.

Thus, for managing massive PPH, we require a simple, safe, cost-effective uterine preserving procedure, which can be adopted in emergency situations even by obstetricians who lack sufficient training and skill for more complex procedures. B-Lynch [8] was the first to propose the innovative principle that a compression suture running through the full thickness of both the uterine walls is an effective measure to control bleeding in PPH because of uterine atony. Since the original report, various modifications of the B-Lynch procedure, including Hayman stitch, have been used. The modifications have the added advantage of being simpler to perform and avoiding the need to open the uterus.

Because Hayman stitch involves crossing the uterine cavity to appose the anterior and posterior wall above the bladder reflection, theoretical concerns on the potential risks of the cavity occlusion and infections have been raised [8,9]. To combat this, first, uterine cavity exploration should be performed as a first step before considering the diagnosis of uterine atony; second, collection of blood clots within the uterine cavity can be averted by applying bimanual compression to both sides of the uterus at the time when the suturing is undertaken. Ochoa et al [10] reported a case of pyometra after using the multiple square suture technique, and the patient later developed Asherman's syndrome. It may be because of the fact that their technique constructs a square dead space in the uterine cavity from which blood or fluid cannot escape. Neither hematometra nor pyometra was the complication in present study as the parallel vertical suture technique avoids such a dead space. It is concluded that two parallel vertical compression sutures placed in the lower uterine segment effectively controls bleeding when medical measures fail to do so. The technique appears to minimize either immediate or long-term complications. Hayman stitch

may be a valuable addition to the current armamentarium of conservative treatment of atonic PPH particularly for those gynecologists who lack sufficient training and skill for more complex procedures. It is concluded that, in the face of uncontrolled hemorrhage, this simple procedure be tried first before other complex measures are undertaken.

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