



Safety of Uterine Compression Suture in the Management of Postpartum Hemorrhage: A Case Report

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ABSTRACT

Uterine atony is the main cause of postpartum hemorrhage (PPH). Uterine compression suture is a common technique to control PPH in caesarean delivery. This article aimed to report a complication of this method for post-delivery atony. A 27-year-old primigravida woman with term pregnancy underwent caesarean delivery and was unresponsive to medical therapy and uterine artery ligation due to uterine atony. Two compression sutures were placed on her uterus. However, after 11 days, the patient underwent surgery again due to severe fever, infection, and a necrotic mass in the uterine cavity. The necrotic mass was removed during the surgery. Although uterine compression suture is an effective method for the treatment of PPH, we witnessed some side effects in the patient, especially myometrium necrosis.

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Introduction

Postpartum hemorrhage (PPH) is a frequent cause of maternal mortality and morbidity across the world (1). Uterine atony is considered to be the main cause of PPH, the treatment of which involves medical therapy and surgical treatment (2). Among various techniques for the management of PPH, uterine compression sutures (especially B-Lynch suture) are the most common approach. Although several studies have evaluated the efficacy of this method, no specific complications have been reported for compression sutures.

In this article, we presented a case of uterine atony treated by B-Lynch suture, which was complicated with postoperative abscess inside the myometrium.

Case report

A 27-year-old primigravida woman with term pregnancy was admitted in the active phase of labor. Upon admission to the hospital, cervical examination of the patient included five-centimeter dilation, 60% effacement, and -2 station, and her vital signs were normal. In addition, she had no medical and surgical history. Dilation became full within three hours with spontaneous contractions; however, she underwent caesarean section due to transverse arrest after two hours.

Due to mild atony during the caesarean delivery, the patient was administered with a high dose of oxytocin (100 units per one liter of Ringer's lactate) and rectal misoprostol (800 micrograms). The abdominal wall was closed, and the patient

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was transferred to the recovery room with good general conditions. After three hours of complete care, she was transferred to the obstetrics ward.

Uterine atony occurred again, and the patient had vaginal bleeding six hours after the operation. Despite massaging the uterus and re-administration of oxytocin and misoprostol, vaginal hemorrhage continued, so that the patient was candidate for relaparotomy nine hours after caesarean delivery. However, due to unresponsiveness and continuing hemorrhage, the uterine was opened by Kerr incision. The uterine was packed with long gauze, and B-Lynch suture was repeated. Moreover, a cyclic suture was placed in the uterine isthmus in order to preserve the uterine.

After the cessation of the hemorrhage, the abdominal wall was closed, and the patient was admitted at the intensive care unit (ICU) and prescribed with cefazolin and gentamicin. In the ICU, the patient was in good general conditions with no vaginal bleeding.

In the ICU, test results of the patient were as follows: platelet count=30,000, white blood cells=21,000, alanine transaminase=260, aspartate aminotransferase=300, international normalized ration=4, and creatinine =1. The long gauze was removed through the vagina 36 hours after the surgery.

After three days, since the patient was highly febrile, she was started on antibiotic treatment with meropenem and vancomycin. Of note, the breast and abdominal examinations and CX-ray of the patient were normal, and no organisms had grown in her blood culture.

All the test results of the patient were observed to improve six days after the surgery, and the patient was discharged without fever and antibiotic prescription. However, the patient was re-hospitalized five days after discharge, with a high fever ($T=40^{\circ}\text{C}$), pulse rate of 130, and blood pressure of 100/60. Fundal height of the patient was 24 weeks. In the bimanual examination, she had an abnormal and tender uterus with an open cervix, while no vaginal odor or discharge was detected. Abdominal and pelvic X-ray was performed to confirm the absence of an external object in the uterus.

Abdominal and pelvic CT-scan revealed enlarged uterus and a pea-shaped structure with liquid air density, which continued to the pelvic floor. In the transvaginal ultrasound, some gases in the myometrium and liquid air level inside the uterus were observed; therefore, the patient underwent sonography-guided curettage. Although the uterus cavity was empty, a small myometrial necrotic tissue was removed.

Considering the diagnosis of abscess inside the myometrium, the patient was started on intrave-

nous antibiotics, including ampicillin-sulbactam, meropenem, and metronidazole. After two days, the fever stopped, and the patient was discharged with a recommendation to continue treatment for up to three weeks.

Two weeks after her second discharge, the patient was referred to the clinic due to a fever of 38°C . In the vaginal examination, a necrotic mass was detected (approximatediameters: $10\times 12\text{ cm}$), which was removed through the cervix and torn during the examination, releasing 400-300 cc of malodorous pus.

Test results of the patient were indicative of gram-negative and gram-positive cocci. However, the patient did not consent to be hospitalized and was prescribed with an experimental antibiotic regimen with metronidazol. Finally, the patient was examined after four weeks, and her uterine was normal with no abnormalities in the ultrasound of the uterus and ovaries.

Discussion

PPH leads to maternal mortality in 19.1% of mothers after childbirth. In France, the mortality rate associated with PPH has been reported to be 1.6 cases per 100,000 live births (7). According to statistics, the prevalence of PPH has increased by 27.5% from 1995 to 2004; this could primarily be attributed to the high incidence of uterine atony (8).

Surgical treatments, such as compression sutures, are performed following the failure of medical therapy. According to the literature, the success rate has been estimated to be 91.7% for various compression sutures (9), while in our recent study, we concluded that the strengths and limitations of therapeutic options, including compression sutures, must be further monitored. It is likely that the effective use of compression sutures is associated with the protective physiological process in the uterus. In other words, compression sutures could be explanted for the rapid involution of the uterus within the first week postpartum (10).

Consistent with the findings of the present study, Tsitlakidis et al. reported a case of successful pregnancy after PPH during the longest follow-up period (10 years). In this regard, other published data have also confirmed that the B-Lynch surgical technique is safe, advantageous, and without short-term and long-term complications (11). Nevertheless, there are ongoing concerns about this technique in terms of uterine adhesions, partial ischemia, necrosis, infections, and myometra (9).

Akoury H. et al. presented the case of a healthy 32-year-old woman (gravida 3, para 0) and used two Cho and one B-Lynch sutures in order to control PPH. The researchers identified a large trian-

gular myometrial defect and two smaller defects in the mid-anterior and posterior uterine wall, respectively (12). Furthermore, in the study conducted by Gottlieb AG., a 33-year-old woman (gravida 2, para 0-1-0-1) received two compression sutures due to uterine atony. On day eight postoperatively, the patient was transferred to the operating room for a second surgery due to a high antibiotic-resistant fever. During the laparotomy, a fundal uterine necrosis was detected at the site of the suture (13). In another similar study, Reyftmann L. noted a partial uterine necrosis after the placement of four Cho sutures to control PPH (14). However, our patient underwent a second surgery due to severe fever, infection, and a necrotic mass in the uterine cavity. As mentioned earlier, the necrotic mass was removed during the operation.

Various materials are used in sutures, such as vicryl, polydioxanone, and nylon. Studies have emphasized on avoiding the usage of non-absorbable or slowly absorbable sutures (15). In their study, Wu HH. et al. used multiple square sutures for a primigravida woman with severe PPH and observed the partial obstruction of the menstrual flow with uterine synechiae. According to the results, hysteroscopy revealed unabsorbed sutures in the uterus (16). In the current research, we used absorbable sutures for a primigravida woman. Therefore, medical professionals are advised to use soluble suture materials so as to reduce the risk of uterine rupture and necrosis in the procedure, while uterine rupture has been reported during the placement of manual compression sutures (17).

In another research, Sentilhes et al. reported a case of Asherman's syndrome with the obliteration of the uterine cavity after the placement of B-Lynch sutures, which might lead to temporary or permanent infertility (18). Several cases of successful pregnancy after compression sutures techniques have been reported in the literature (19), and it is recommended that physicians and patients be aware of the possible complications associated with this technique (12).

Based on the observations in the present study, we suggest postoperative follow-up in order to establish a national registry of the cases with the placement of compression sutures. By doing so, we would be able to document the effects of this method on potential fertility, infertility, and menstrual flow, while also evaluating the short-term and long-term complications of this procedure. However, it may be difficult to monitor the fertility outcomes of the women with compression sutures since some of them avoid pregnancy due to the fear of recurring PPH (19, 20). Moreover, data is scarce on the menstrual cycles of women following the

placement of compression sutures. These limitations highlight the need for a database to register the success or failure of suture placement and record the complications associated with compression sutures (e.g., B-Lynch sutures) (9).

In summary, most of the studies in this regard have mentioned the high efficacy and lack of complications in using compression sutures (e.g., B-Lynch sutures). On the other hand, findings of the current research and some similar studies are indicative of complications such as high antibiotic-resistant fever, ischemia, uterine necrosis, and uterine adhesions due to the use of this technique. Given this discrepancy, it is critical to follow-up the women who receive compression sutures, and prospective studies could be beneficial in this regard. As a result, we could collect a reliable database in order to assess the short-term and long-term effects of this technique and discover whether it affects potential fertility in the future.

Conclusion

According to the results, although uterine compression suture are effective in the management of PPH, surgeons must be aware of the potential complications and side effects of this technique.

Conflict of Interest

The authors declare no conflict of interest.

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