

A Useful Technique for the Control of Severe Cesarean Hemorrhage: Report of Three Cases

Yiu-Tai Li, MD; Chang-Sheng Yin¹, MD; Fu-Min Chen, MD; Te-Chang Chao², MD

When we are confronted with a patient experiencing placenta previa with massive hemorrhage in cesarean delivery, hemostasis is first attempted using uterotonic drugs, uterine massage, and intrauterine packing. However, if these maneuvers fail, then uterine artery ligation, whole myometrial suture, and subendometrial vasopressin injection should be attempted. Perhaps these procedures alone or in combination can successfully control the hemorrhage. Every obstetrician must be familiar with these simple methods in order to avoid having to perform a hysterectomy and thus preserving the reproductive capability, as well as diminishing the operative morbidity. Finally, we described a full thickness suture for the placental site of bleeding for the lower uterine segment. (*Chang Gung Med J* 2002;25: 548-52)

Key words: placenta previa, conservation treatment, vasopressin.

When faced with a patient with an unresponsive and significantly adherent placenta such as placenta previa, brisk bleeding from the placental implantation site in the lower uterine segment sometimes may cause difficulty in achieving hemostasis. First at all, different traditional methods should be used to attempt to stop hemorrhaging including sustained uterine massage, uterine packing, uterotonic agents such as oxytocin, ergometrine, and prostaglandin, as well as oversewing the placental bed. Usually, a hysterectomy is promptly considered when all of the above measures taken to stop hemorrhage fail. However, hysterectomy can be undesirable particularly in low parity women. Here, we present a case complicated by placenta previa with massive hemorrhaging, who was successfully treated using a combination of multiple methods to preserve the uterus. We also described a full thickness suture for the bleeding site of the uterine wall.

CASE REPORTS

Case 1

A 28-year-old woman, gravida 3, para 1, with a history of previous cesarean delivery and curettage, was seen at 35 weeks' gestation with complaints of persistent right upper quadrant abdominal pain and suprapubic cramping. The antepartum history was unremarkable except for gestational diabetes diagnosed at 26 weeks of gestation, which was treated with diet control. During admission, abdominal ultrasonography revealed a normal viable fetus with placenta previa totalis. In addition, the retroplacental hypoechoic zone was identified beneath the entire placenta. The maternal serum α -fetoprotein level in the second trimester was 0.79 multiple of the median value. Laboratory test results were all within reference ranges. With ritodrine infusion, the cardiotocography showed fetal tachycardia with irregu-

From the Department of Obstetrics and Gynecology, Chung Shan Hospital Taipei; ¹Department of Obstetrics and Gynecology, Kang Ning General Hospital, Taipei; ²Department of Obstetrics and Gynecology, Buddhist Tzu-Chi General Hospital, Hualien.

Received: Sep. 21, 2001; Accepted: Dec. 11, 2001

Address for reprints: Dr. Yiu-Tai Li, Department of Obstetrics and Gynecology, Chung Shan Hospital, 11 Jen-Ai Road, Section 4, Taipei, Taiwan, R.O.C. Tel.: 886-2-27081166; Fax: 886-2-27081507; E-mail: drgynobs@yam.com.

lar contractions. Subsequently, she suddenly developed uterine bleeding; thus, a cesarean delivery was performed.

A Pfannestiel incision was employed along the previous scar. A normal 3250 g female infant was delivered via a cut through of the anterior attachment of the placenta at the lower uterine segment. The Apgar scores were 8 and 9 at 1 and at 5 min, respectively. After manual removal of the placenta, heavy bleeding developed immediately from the lower uterine segment. At that time, hemostasis was attempted using oxytocin, ergometrine, direct uterine massage, and uterine packing. However, massive hemorrhage persisted with no improvement. Subsequently, ligation of bilateral descending branches of the uterine arteries was performed inferior to the angles of the uterine incision. As the bleeding continued and after inferior deflection of the bladder flap, multiple sutures with 1-0 chromic catgut were applied at the bleeding sites through the entire thickness of the anterior uterine wall. Importantly, the knots were tied outside the serosal surface. These sutures began at the most superior portion of the lower uterine segment and progressed inferiorly. The hemorrhage reduced significantly after this procedure. However, some bleeding continued from the cervical area although at a much lesser severity. During this stage, we utilized 1 ml of vasopressin diluted with 19 ml isotonic sodium chloride solution to infiltrate subendometrially at the bleeding sites. Thereafter, all bleeding completely stopped. The remaining procedures were performed in the usual manner. Total blood loss was estimated to be 1800 ml, and eight units of packed red blood cells were given. The patient returned home in stable condition 7 days after admission.

Case 2

A 35-year-old woman presented at 32 weeks' gestation with painless vaginal bleeding. Her obstetric history was notable for three uneventful vaginal deliveries. At that time, ultrasonogram demonstrated a living fetus compatible with gestational age and a complete placenta previa without retroplacental lucency. Due to persistent vaginal bleeding, a classical cesarean section was done via a fundal incision to avoid damage to the placenta. After the fetus was delivered and the placenta was manually removed, considerable bleeding ensued from the placental

implantation sites. Subsequently, we attempted to suture the full thickness of the uterine wall at the bleeding sites, and then the hemorrhage dramatically subsided. The woman made an uneventful recovery after a transfusion of four units of packed red cells.

Case 3

The patient is a 32-year-old woman in her second pregnancy at 37 weeks' gestation with a history of previous cesarean section. Ultrasonic evaluation revealed a living fetus with an anterior, low lying-placenta. A cesarean delivery was carried out. The abdomen was entered through a Pfannestiel incision along the previous scar. After manual removal of the placenta, a large area of oozing bleeding continued from the placenta sites. Oxytocic agents and intrauterine packing were used, all without effecting hemostasis. Finally, multiple full thickness suturing of the uterine successfully stopped the bleeding in these areas. No blood transfusion was given. Her recovery was uneventful.

DISCUSSION

Previous cesarean delivery is an essential influencing factor for the subsequent development of placenta previa. In one report, the risk of placenta previa in patients with previous cesarean delivery was approximately 5 times greater than in patients without uterine scars.⁽¹⁾ Furthermore, in most studies the reported incidence of placenta previa increased proportionately with the number of prior cesarean deliveries.⁽²⁻⁵⁾ A uterine scar in the lower segment may effect the location of implantation of the placenta, or failure of differential growth of a scarred lower uterine segment may develop into placenta previa.

In a patient complicated by placenta previa, profuse hemorrhage may occur immediately after separating the placenta from the uterine wall. Bleeding is thought to be due to poor contraction of the lower uterine segment and subsequent inability to compress the torn vessels. The initial steps in securing hemostasis such as in the presented case include the use of uterotonic agents, uterine massage, and intrauterine packing. However, once profound uterine hemorrhage occurs, it may be unlikely for the uterine vasculature to respond to vasoconstrictor agents, because of the potential absence of constrictor reactivity of the uterine vasculature as a result of an

unknown mechanism.⁽⁶⁾ Direct ligation of the uterine vessels has been documented to arrest bleeding at a cesarean section.⁽⁷⁾ Bilateral mass ligation of the descending branch of the uterine arteries and veins involves placing a suture to include 2 to 3 cm of the myometrium, at a level 2 to 3 cm beneath the uterine incision. If bleeding persists, the next step should be occlusion of the arcuate artery and its branches at the bleeding sites. This is because the uterine artery penetrates into the uterine wall, which is ramified into arcuate arteries which pass parallel to the serosal surface. Subsequently, they branch into radial, basal, and spiral arteries which extend at right angles toward the endometrium. Therefore, the suturing technique of the anterior lower segment in this case started from the serosa to penetrate into the endometrium. Then the needle was reinserted from the endometrium to the serosa, 2 cm lateral from the first suture point (Fig. 1). Thus, the knot was tied outside the serosal surface. This technique was through the full thickness of the uterine wall and occluded all arteries. The conventional sutures performed in the placental bleeding site are generally superficial and are of less effectiveness in hemostasis (Fig. 2). Similarly, the suturing technique of the posterior uterine wall is the same except using the surgical straight needle in instead of the conventional curve needle when required. This is because the thickness of the posterior uterine wall is usually greater than that of the anterior lower uterine segment. Understanding the distribution of these vessels, one can explain why oversewing the entire thickness of the uterine wall is more effective than only using endometrial sutures for hemostasis. However, using this new technique repeatedly could completely obliterated the arcuate artery along with the serosal layer of the uterus. Abu-Mesa et al. first recommended this method to successfully secure bleeding placental sites in several cases.⁽⁸⁾ In addition, we have used this technique to manage several cases with promising outcomes during recent months, such as for our cases 2 and 3.

However, vasopressin is known as a potent vasopressor. Recently, some authors have used vasopressin alone to arrest cesarean hemorrhage with dramatic effects.^(9,10) All of their patients had excellent outcomes. Simultaneously, this was our first experience in achieving a promising result in using vasopressin to stop cervical hemorrhage.

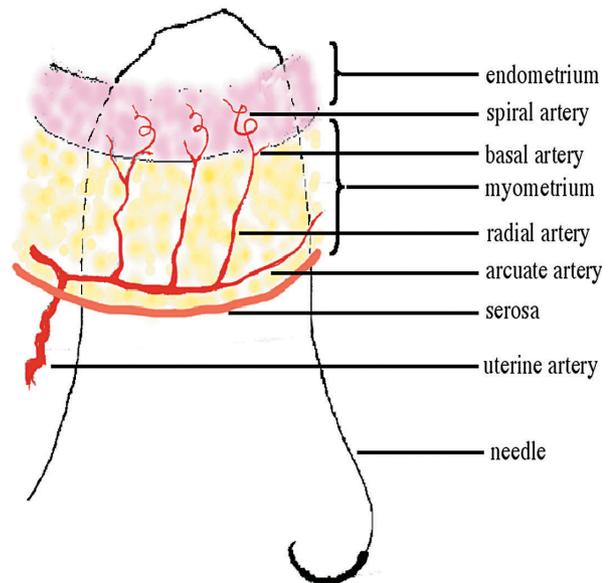


Fig. 1 Novel suture method of hemostasis in cesarean hemorrhage.

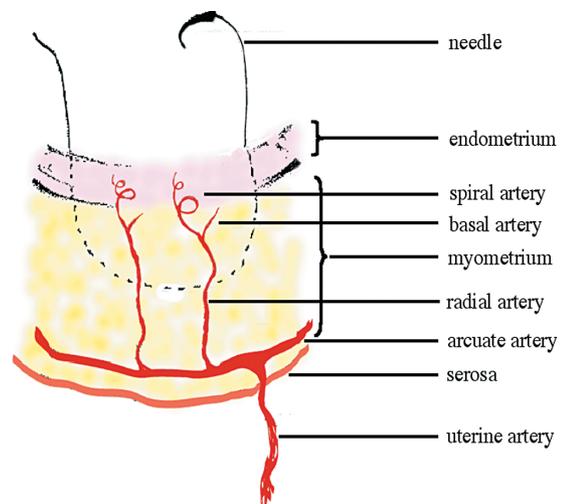


Fig. 2 Conventional suture method of hemostasis in cesarean hemorrhage.

In conclusion, when confronted with a patient experiencing placenta previa with massive bleeding, preserving childbearing function and minimizing bleeding should be carefully considered. In addition to traditional maneuvers, conservative modes including uterine artery ligation, placental site suturing, and vasopressin infiltration might produce promising outcomes.

REFERENCES

1. Chattopadhyay SK, Kharif H, Sherbeeri MM. Placenta previa and accreta after previous cesarean. *Eur J Obstet Gynecol Reprod Biol* 1993;52:151-6.
2. Clark SL, Koonings PP, Phelan JP. Placenta previa/accreta and prior cesarean section 1985;66:89-92.
3. Miller DA, Chollet JA, Goodwin TM. Clinical risk factors for placenta previa-placenta accreta. *Am J Obstet Gynecol* 1997;177:210-4.
4. To WW, Leung WC. Placenta previa and previous cesarean section. *Int J Gynecol Obstet* 1995;51:25-31.
5. Zaki ZMS, Bahar AM, Ali ME, Albar HAM, Gerai MA. Risk factor and morbidity in patients with placenta previa accreta compared to placenta previa non-accreta. *Acta Obstet Gynecol Scand* 1998;77:391-4.
6. Nelson SH, Suresh MS. Lack of reactivity of uterine arteries from patients with obstetric hemorrhage. *Am J Obstet Gynecol* 1992;166:1436-43.
7. O'Leary JA. Uterine artery ligation in the control of postcesarean hemorrhage. *J Reprod Med* 1995;40:189-93.
8. Abu-Musa A, Seoud M, Suidan F. A new technique for control of placental site bleeding. *Int J Gynecol Obstet* 1998:169-70.
9. Lurie S, Appelman Z, Katz Z. Intractable postpartum bleeding due to placenta accreta: local vasopressin may save the uterus. *Br J Obstet Gynecol* 1996;103:1164.
10. Zaki ZMS, Bahar AM. Massive hemorrhage due to placenta previa accreta: a useful role for vasopressin. *J Obstet Gynecol* 1997;17:486-7.

控制嚴重剖腹產出血的一種有效方法：三例報告

李耀泰 尹長生¹ 陳福民 趙德彰²

當一患者在剖腹產時，如因前置胎盤導致嚴重出血，止血方法常包括子宮收縮劑，子宮按摩和子宮壓逼法等。但是一旦這些方法失敗，子宮動脈結紮，全部子宮肌肉層縫合和子宮內膜以血管收縮素 (vasopressin) 注射可以嘗試。可能單獨或結合這些方法，能成功的止血，每一位產科醫師都應熟悉這些簡單方法，避免子宮切除，並保留生育的能力，更可減少手術的罹病率。(長庚醫誌 2002;25:548-52)

關鍵字：前置胎盤，保守治療，血管收縮素。