

Severe postpartum hemorrhage with placental abruption managed by the uterine sandwich: a case report

Ichiro Miwa, Masahiro Shinagawa, Terumi Miwa, Keiko Ootani, Masakatsu Sase, Yasuhiko Nakamura

Department of Obstetrics and Gynecology, Yamaguchi Grand Medical Center, Houhu (Japan)

Summary

Purpose of investigation: The authors report a case of severe postpartum hemorrhage (PPH) with placental abruption managed using the uterine sandwich. **Case Report:** A 24-year-old woman with placental abruption was referred to Yamaguchi Grand Medical Center at 35 weeks of gestation. Cesarean section was performed, and severe PPH occurred. After an intrauterine Bakri balloon and B-Lynch suture were applied and uterine bleeding was controlled. The total blood loss was 4,090 ml. Transfusion included 16, 22, and 20 U of red cell concentrates (RCC), fresh frozen plasma (FFP), and platelet concentrates (PC), respectively. The patient was discharged with no complications eight days postoperatively. **Conclusion:** The uterine sandwich is an effective option for the treatment of severe PPH.

Key words: Postpartum hemorrhage; Placental abruption; Uterine sandwich; Bakri balloon; B-Lynch suture.

Introduction

Postpartum hemorrhage (PPH) is a significant factor in maternal mortality and morbidity. Placental abnormalities are a major contributor to obstetric hemorrhage. The common placental abnormalities include placental abruption, placenta previa, and adherent and retained placenta. Placental abruption complicates 0.4–1% of pregnancies [1-3].

The Bakri balloon is a fluid-filled tamponade balloon that is inserted into the uterine cavity to achieve temporary control or reduction of PPH [4]. The B-Lynch suture is a brace suture used to mechanically compress an atonic uterus during severe PPH [5]. Occasionally, the B-Lynch suture has been combined with the Bakri balloon, which is termed as the uterine sandwich, to achieve successful hemostasis [6-8], but no prior reports have described the use of a uterine sandwich for managing placental abruption.

The authors report a case of severe PPH with placental abruption managed using the uterine sandwich.

Case Report

A 24-year-old woman, gravida 0, was referred to the present hospital because of abdominal pain with mild vaginal bleeding at 35 weeks of gestation. Ultrasound examination revealed a thickened placenta with heterogeneous echogenicity for retroplacental hematoma and a fetal heart rate of approximately 130 bpm. Laboratory tests showed disseminated intravascular coagulation. She was taken to the operating room after being diagnosed with placental abruption. Appropriate blood products were requested. Cesarean section was performed under general anesthesia, and a 2,399-gram female neonate was delivered with an Apgar score of 0 and 5 at one and five minutes, respectively. The baby was ad-

mitted to the neonatal intensive care unit. Blood clots and the placenta, which had completely separated from the uterus, were evacuated. The dark red uterine body, which is termed as the Couvelaire uterus, was completely atonic and bleeding profusely. Uterine vascular and muscular tightening measures were conducted immediately. Intramyometrial oxytocin 15 IU, an intra-



Figure 1. — An intrauterine Bakri balloon and B-Lynch suture are applied and uterine bleeding is controlled.

Revised manuscript accepted for publication September 6, 2017

venous infusion of oxytocin 10 IU, and dinoprost 3,000 mcg in 500 ml saline was administered, but was ineffective. Therefore, an intrauterine Bakri balloon filled with 400 ml saline was placed transabdominally. When this did not stop the bleeding, a B-Lynch suture using 1-monocryl was applied (Figure 1). After the uterine bleeding was controlled, the uterine and abdominal incisions were closed. The total blood loss was 4,090 ml. The authors transfused 16, 22, and 20 U of red cell concentrates (RCC), fresh frozen plasma (FFP), and platelet concentrates (PC), respectively. Twenty-four hours postoperatively, the Bakri balloon was removed vaginally. The patient was discharged with no complications eight days postoperatively. The patient was followed-up one month later and no additional problem was detected.

Discussion

PPH is an important cause of morbidity and mortality [9, 10]. Placental abruption is one of the causes of PPH. When placental abruption occurs, blood infiltrates between the myometrial fibers from behind the placenta and sometimes permeates the whole thickness of the myometrium. This transforms the uterine body from pink to dark red, which is the hallmark of a Couvelaire uterus. Couvelaire uteri, which very rarely occur with effective postpartum uterine contractions, can lead to uterine atony and further hemorrhage [11].

Management of PPH begins with conservative methods, as bimanual uterine compression; use of uterotonics; uterine balloon tamponade; and rarely, with arterial embolization. The Bakri balloon is an intrauterine device indicated to control PPH. The effectiveness of intrauterine balloon tamponade is similar to that of other methods used for the conservative management of PPH, such as arterial embolization, surgical ligation of the uterine arteries, or uterine compression suture [12]. However, intrauterine balloon tamponade is less invasive, more rapid, and simple to perform. Hemostatic brace suture was described by B-Lynch in 1997 [5]. The B-Lynch suture has been useful in controlling bleeding in cases of uterine atony [13, 14]. The uterine sandwich applies forces to the myometrium from the inside and outside. This technique has been described to be effective in five cases of PPH by Nelson and O'Brien [6]. Yoong *W et al.* [7] reported 11 PPH cases and Diemert *et al.* [8] reported six PPH cases treated with the uterine sandwich. The potential complications of this technique include endomyometritis, uterine lacerations, and uterine necrosis resulting from poor perfusion, as described by Kumara *et al.* [15]. In the present case, none of the complications described above were observed.

In conclusion, the authors report the first case of severe PPH with placental abruption managed by using the uterine sandwich. This technique is an effective option for the treatment of severe PPH.

References

- [1] Ananth C.V., Smulian J.C., Demissie K., Vintzileos A.M., Knuppel R.A.: "Placental abruption among singleton and twin births in the United States: risk factor profiles". *Am. J. Epidemiol.*, 2001, 153, 771.
- [2] Tikkanen M.: "Placental abruption: epidemiology, risk factor and consequences". *Acta. Obstet. Gynecol. Scand.*, 2011, 90, 140.
- [3] Pariente G., Wiznitzer A., Sergienko R., Mazor M., Holcberg G., Sheiner E.: "Placental abruption: critical analysis of risk factors and perinatal outcomes". *J. Matern. Fetal. Neonatal. Med.*, 2011, 24, 698.
- [4] Bakri Y.N., Amri A., Abdul Jabbar F.: "Tamponade-balloon for obstetrical bleeding". *Int. J. Gynaecol. Obstet.*, 2001, 74, 139.
- [5] B-Lynch C., Coker A., Lawal A.H., Abu J., Cowen M.J.: "The B-Lynch surgical technique for the control of massive postpartum haemorrhage: an alternative to hysterectomy? Five cases reported". *Br. J. Obstet. Gynaecol.*, 1997, 104, 372.
- [6] Nelson W.L., O'Brien J.M.: "The uterine sandwich for persistent uterine atony: combining the B-Lynch compression suture and an intrauterine Bakri balloon". *Am. J. Obstet. Gynecol.*, 2007, 196, 9
- [7] Yoong W., Ridout A., Memtsa M., Stavroulis A., Aref-Adib M., Ramsay-Marcelle Z., *et al.*: "Applocation of uterine compression suture in association with intrauterine balloon tamponade ('uterine sandwich') for postpartum hemorrhage". *Acta. Obstet. Gynecol. Scand.*, 2012, 91, 147.
- [8] Diemert A., Ortmeyer G., Hollwitz B., Lotz M., Somville T., Glosemeyer P., *et al.*: "The combination of intrauterine balloon tamponade and the B-Lynch procedure for the treatment of severe postpartum hemorrhage". *Am. J. Obstet. Gynecol.*, 2012, 206, 65.
- [9] Bouvier-Colle M.H., Mohangoo A., Gissler M., Novak-Antolic Z., Vutuc C., Szamotulska K., *et al.*: "What about the mothers? An analysis of maternal mortality and morbidity in perinatal health surveillance systems in Europe". *BJOG.*, 2012, 119, 880.
- [10] Hogan M.C., Foreman K.J., Naghavi M., Ahn S.Y., Wang M., Makela S.N., *et al.*: "Maternal mortality for 181 countries, 1980-2008: A systematic analysis of progress towards Millennium Development Goal 5". *Lancet.*, 2010, 375, 1609.
- [11] Cunningham F.G., Gant F., Leveno J.: "Williams obstetrics". 23rd ed. New York: McGraw Hill, 2010, 766.
- [12] Doumouchtsis S.K., Papageorghiou A.T., Arulkumaran S.: "Systematic review of conservative management of postpartum hemorrhage: what to do when medical treatment fails". *Obstet. Gynecol. Surv.*, 2007, 62, 540.
- [13] Allahdin S., Aird C., Danielian P.: "B-Lynch sutures for major primary postpartum haemorrhage at caesarean section". *J. Obstet. Gynaecol.*, 2006, 26, 639.
- [14] Enriquez M., Maruri G., Ezeta G., Hidalgo L., Perez-Lopez F.R., Chedraui P.: "The B-Lynch technique for the management of intraoperative uterine atony". *J. Obstet. Gynaecol.*, 2012, 32, 338.
- [15] Saman Kumara Y.V., Marasinghe J.P., Condous G.S., Marasinghe U.: "Pregnancy complicated by a uterine fundal defect resulting from previous B-Lynch suture". *BJOG.*, 2009, 116, 1815.

Corresponding Author:

I. MIWA, M.D., PHD

Department of Obstetrics and Gynecology

Yamaguchi Grand Medical Center

77 Oosaki, Houhu 747-8511 (Japan)

e-mail: miwaichiro@mail.goo.ne.jp