



## Editorial

## The better way-uterine feeding vessel occlusion to manage postpartum hemorrhage

## Keywords:

Hypogastric artery ligation  
Maternal death  
Postpartum hemorrhage  
Uterine artery embolization

In this January issue of the *Taiwanese Journal of Obstetrics and Gynecology*, Dr. Wang and colleagues conducted a retrospective study to report their experience of the use of the blockage of feeding vessels to the uterus either by hypogastric artery ligation (HAL) ( $n = 9$ ) or transcatheter uterine artery embolization (UAE) ( $n = 31$ ) in the management of women with postpartum hemorrhage (PPH) [1]. The authors found that the most common cause of PPH was atony (29/40, 72.5%), and the precipitating factors for PPH included history of uterine surgery (15%), accrete (5%), and twin pregnancy (10%) [1]. After comparing the maternal outcomes between two procedures (HAL vs. UAE), all HAL cases were survived and there were two women's death (6.5%) in the UAE group, even though the authors found that patients in the HAL group had a significantly greater volume of blood loss, lower hematocrit value, much more units of blood transfusion, higher percentage of the needs of intensive care and a longer stay of hospitalization than patients in the UAE did [1]. Therefore, the authors highlighted the value of using HAL in the management of patients with PPH. This article is very interesting and worthy of discussion.

First, blockage of uterine feeding vessels could be performed by radiologists (UAE) or by surgeons (HAL or uterine artery (vessel) ligation or occlusion-UA[V]L or UA[V]O) and the former is much more popular in the management of women with major obstetric hemorrhage [2,3]. In addition, the aim of both procedures is an attempt to preserve the uterus [2,3]. However, sometimes, peripartum hysterectomy cannot be totally escaped for the purpose of saving a life [4–6]. Since HAL and/or UVL should be performed by surgical approach, therefore, it is often done during or after cesarean section when these patients were complicated with severe hemorrhage. This type hemorrhage is frequently secondary to placental, and uterine problems. However, the clinical suspicion of internal bleeding, regardless of which mode of delivery (cesarean section or vaginal delivery) was done might contribute to the choice of HAL and/or UVL in place of UAE [7,8]. By contrast, UAE was widely applied in any situation of PPH, and it can be performed before the plan of delivery and/or immediately or lately

after the delivery. Based on the different causes of PPH, it is hard to suggest which one is a better approach in the management of women with PPH if we face the different situations of PPH. In addition, HAL is often considered as a much more invasive procedure than UAE is. HAL needs “operation” and is often mediated by “exploratory laparotomy”. Therefore, the concern of which one between UAL and UAE should be made for women with PPH is always present. The majority of physicians and patients or their family would like to be treated with a less invasive procedure, such as UAE. This consideration is really confirmed by authors because over three-fourths of women with PPH were treated with UAE in their report [1]. If any study would like to compare the outcome between both procedures, the above-mentioned concern should be considered.

Based on the concerning the invasiveness of not, the issue of “time” between the delivery and the initiation of using uterine feeding vessels occlusion method—UAE or HAL should be carefully evaluated. It is important and critical. According to the authors' statement, the much more severe condition of the patients was found in the HAL group, including much lower pre-procedure hemoglobin level, much lower pre-procedure hematocrit, much more blood transfusion of packed red blood cells and fresh frozen plasma, and much bigger volume of pre-procedure blood loss (PPH), suggesting that much more urgent and critical clinical condition of patients in the HAL group could be predicted, which might result in the selection bias of the current study. The golden time between the occurrence of these catastrophic problems (life-threatening PPH) and the initial use of blockage of uterine vessels (HAL or UAE) may be a key factor for saving maternal life. Unfortunately, there is no consensus to state this concern.

Second, the underlying causes of PPH might be very important, which might contribute to the maternal death directly or indirectly, although it did not reach the statistical significance ( $p = 0.091$ ) [1]. However, in the Wang's study [1], only two women finally died and the cause of death was the occurrence of intractable disseminated intravascular coagulopathy (DIC). However, DIC is a result, which is secondary to many causes. To evaluate the cause of death, and the precipitating factor of DIC should be clarified. In the current study, although we did not know the real cause of DIC, and it is rational to guess that both patients were severe PPH cases. Unfortunately, the authors did not provide the underlying causes (atony, abruption, accreta, or lacerations) [1]. It is unfair to neglect the advantages of UAE and directly give a conclusion that bilateral HAL should be performed as soon as possible when obstetric emergency conditions are indicated [1].

Third, atony of the uterus is the most common cause of PPH (72.5%), as shown by authors [1]. The frequency of atony is

relatively higher in the UAE group than that in the HAL group (77% vs. 56%), although it did not reach the statistical significance. For the management of atony or other causes of PPH, many procedures and agents could be applied, and all can be easily found in the literature review [9–14]. However, we did not know what strategy had been already applied on the patients in the current study. We believed that all patients had been treated with any useful procedure and started massive transfusion protocol in obstetric [15], which has been mentioned above.

PPH is still a big challenge in modern obstetric practice, and blockage of uterine feeding vessels is one of the best and effective procedures not only for uterus preservation but also for life saving. However, it is still uncertain whether HAL by surgeons or UAE by radiologists should be considered at first, but we believe the choice may be dependent on individual's condition, such as the cause of PPH, facility and clinical condition.

### Acknowledgements

This work was supported by grants from the Taipei Veterans General Hospital (V108C-085) and from the Ministry of Science and Technology, Executive Yuan (MOST: 106-2314-B-075-061-MY3), Taipei, Taiwan.

### Competing interests

The authors declare that they have no competing interests.

### References

- [1] Wang CY, Pan HH, Chang CC, Lin CK. Outcomes of hypogastric artery ligation and transcatheter uterine artery embolization in women with postpartum hemorrhage. *Taiwan J Obstet Gynecol* 2019;58:72–6.
- [2] Tsui KH, Wang PH. Blockage of uterine-feeding vessels-A real choice to maintain the uterus? *J Chin Med Assoc* 2011;74:285–6.
- [3] Li YT, Yeh CC, Chao HT, Wang PH. Preservation of the uterus. *Taiwan J Obstet Gynecol* 2015;54:799–800.
- [4] Yang MJ, Wang PH. Peripartum hysterectomy risk factors in Taiwan. *J Chin Med Assoc* 2010;73:399–400.
- [5] Li YT, Horng HC, Wang PH. An easy method to define the cervical borders during postpartum hysterectomy. *J Chin Med Assoc* 2018;81:223–4.
- [6] Dogan O, Pulatoglu C, Yassa M. A new facilitating technique for postpartum hysterectomy at full dilatation: cervical clamp. *J Chin Med Assoc* 2018;81:366–9.
- [7] Chou YC, Wang PH, Yuan CC, Yen YK, Liu WM. Laparoscopic bipolar coagulation of uterine vessels to manage delayed postpartum hemorrhage. *J Am Assoc Laparosc* 2002;9:541–4.
- [8] Koo FH, Chao HT, Wang PH, Wang HI, Shen SH, Chen CY, et al. Delayed postpartum hemorrhage secondary to idiopathic rupture of right uterine artery: a case report and literature review. *Taiwan J Obstet Gynecol* 2014;53:276–8.
- [9] Chen CY, Su YN, Lin TH, Chang Y, Horng HC, Wang PH, et al. Carbetocin in prevention of postpartum hemorrhage: experience in a tertiary medical center of Taiwan. *Taiwan J Obstet Gynecol* 2016;55:804–9.
- [10] Seow KM, Chen KH, Wang PH, Lin YH, Hwang JL. Carbetocin versus oxytocin for prevention of postpartum hemorrhage in infertile women with twin pregnancy undergoing elective cesarean section. *Taiwan J Obstet Gynecol* 2017;56:273–5.
- [11] Wang PH. Postpartum hemorrhage: a value of carbetocin. *Taiwan J Obstet Gynecol* 2018;57:473–4.
- [12] Alkış İ, Karaman E, Han A, Ark HC, Büyükkaya B. The fertility sparing management of postpartum hemorrhage: a series of 47 cases of Bakri balloon tamponade. *Taiwan J Obstet Gynecol* 2015;54:187–90.
- [13] Soyama H, Miyamoto M, Ishibashi H, Nakatsuka M, Kawauchi H, Sakamoto T, et al. Analysis of prophylactic Bakri balloon tamponade failure in patients with placenta previa. *Taiwan J Obstet Gynecol* 2019;58:159–63.
- [14] Chung JP, Leung TY. Uses of FloSeal® in obstetric hemorrhage: case series and literature review. *Taiwan J Obstet Gynecol* 2017;56:827–30.
- [15] Tanaka H, Matsunaga S, Yamashita T, Okutomi T, Sakurai A, Sekizawa A, et al. A systematic review of massive transfusion protocol in obstetrics. *Taiwan J Obstet Gynecol* 2017;56:715–8.

Yueh-Han Hsu<sup>a,b</sup>, Chang-Ching Yeh<sup>a,b</sup>, Peng-Hui Wang<sup>a,b,c,d,\*</sup>

<sup>a</sup> Department of Obstetrics and Gynecology, Taipei Veterans General Hospital, Taipei, Taiwan

<sup>b</sup> Department of Obstetrics and Gynecology, National Yang-Ming University, Taipei, Taiwan

<sup>c</sup> Institute of Clinical Medicine, National Yang-Ming University, Taipei, Taiwan

<sup>d</sup> Department of Medical Research, China Medical University Hospital, Taichung, Taiwan

\* Corresponding author. Department of Obstetrics and Gynecology, Taipei Veterans General Hospital, and National Yang-Ming University, 201 Section 2, Shih-Pai Road, Taipei 11217, Taiwan. Fax: +886 255702788.

E-mail addresses: phwang@vghtpe.gov.tw, pongpongwang@gmail.com (P.-H. Wang).