

Uterine Artery Embolisation for Management of Refractory Postpartal Haemorrhage

VISHALAKSHI URUNDADY, VRINDA SHETTY

ABSTRACT

Management of Postpartal Haemorrhage (PPH) refractory to medical management continues to be a formidable condition, further compounded by unstable haemodynamic condition and associated coagulopathy, usually associated with this condition. Though surgical exploration is the usual therapeutic option for such patients, selective pelvic arterial embolisation is gaining

the popularity in view of its safety and efficacy profile. Uterine preservation further adds to its advantages.

We present our experience of managing 5 such patients with Uterine Artery Embolisation (UAE). The current status of UAE as therapeutic modality for management of refractory PPH is discussed.

Key Words: Uterine artery embolisation, Refractory postpartal haemorrhage, Selective arterial devascularisation

INTRODUCTION

Postpartum haemorrhage (PPH), the loss of greater than 500 ml of blood following vaginal delivery or 1000 ml of blood following caesarean section, is the common cause of perinatal maternal death and is a major cause of maternal morbidity worldwide [1]. Uterine atony and retained placental tissue are the leading underlying aetiologies and the management modalities comprise of bimanual massage, removal of placental tissue and use of uterotonic agents. Refractory cases may require surgical intervention, which itself poses the procedural risk on already unstable postpartal women [2]. There is a constant search for the therapeutic modalities which are useful for refractory PPH, short of surgery.

We present our experience on use of uterine artery embolisation (UAE) for managing refractory PPH in 5 patients managed at our centre. The present status of this modality for managing PPH is discussed.

METHODS

The data originates from the obstetrics unit and intervention radiology centre of a tertiary care referral hospital at a multispeciality hospital and research centre in South India between January 2009 and December 2010. The patients with severe atonic PPH, refractory to uterine massage and administration of oxytocin and PGF-2 α , were enrolled after stabilisation of haemodynamic parameters and transfusion of required blood components. After taking written informed consent for enrolment and the procedure, the initial evaluation includes a quick assessment of blood volume loss, examination of genital tract for trauma/lacerations, presence of Disseminated Intra-vascular Coagulation (DIC). The decision to perform UAE was based upon persistence of active bleeding despite initial measures, deterioration of hemodynamic status and presence of DIC as a contraindication for surgical intervention.

The procedure of UAE comprised of digital subtraction angiography performed by a vascular radiologist. A unilateral right femoral approach was used and a 5-French femoral arterial introducer was

inserted. Initial aortoiliac angiography was performed in all patients to detect the site of bleeding from the pelvic arteries. Contralateral internal iliac angiography was then performed. Highly selective angiography of the uterine artery was attempted in all patients except in the presence of uterine artery spasm. The ipsilateral internal iliac artery and uterine artery were also catheterized with the same catheter and via the same puncture site. Pledgets of absorbable gelatin sponge (Gelfoam; Upjohn, Kalamazoo, MI), approximately six for each side, were introduced under radioscopic control. Post-embolization angiography was performed to confirm the absence of residual extravasation of contrast agent.

Complete cessation of PPH was the primary outcome measure. The patients were observed for signs of vascular trauma and internal haemorrhage for the 7 to 14 post-operative days in hospital. The patients were reevaluated at 6 weeks and one year after the procedure for long term procedure related complications. The secondary outcome measures evaluated were pain, post procedure weakness of lower limbs, pattern of menstrual cycle and future fertility.

The results were depicted as descriptive statistics. The study was approved by the ethics committee of our institute.

RESULTS

During the study period, 5 patients with severe atonic PPH were enrolled. The relevant clinical details of the patients are depicted in [Table/Fig-1]. The age of patients ranged from 19 to 35 years and all of them were primigravida. All of them had delivered a live newborn by vaginal route. The pre-embolisation therapies in all 5 patients include oxytocin, PGF2 α and PGE1. The mean hemoglobin observed in the patients was 4.84 g/dl (range 3.5 to 6.8 g/dl), the platelet count ranged from 75,000 to 1,40,000 per cmm and 2 of them had the deranged coagulation parameters suggestive of DIC. All patients required variable volume of blood component transfusion for ongoing blood loss prior to embolisation. 2 of the 5 patients required endotracheal intubation and

Parameter	Patient A	Patient B	Patient C	Patient D	Patient E
Interval between onset of bleeding and embolisation (minutes)	435	315	180	150	180
Haemoglobin (g/dl)	4	4.3	5.6	3.5	6.8
Requirement of whole blood units	3	5	2	6	3
Requirement of packed RBC units	6	3	3	6	4
Requirement of platelet concentrate units	0	3	0	4	0
Requirement of FFP units	6	11	2	5	0
Complete resolution of bleeding	Yes	Yes	Yes	Yes	Yes
Post procedure days in intensive care unit	2	4	2	4	2
Post procedure hospital stay (days)	9	14	9	14	8

[Table/Fig-1]: Clinical and laboratory parameters of patients before and after the uterine artery embolisation.

assisted ventilation secondary to haemodynamic instability. The mean interval between the onset of bleeding and the procedure of embolisation was close to 4 hours and the time required for the complete procedure was 40 to 50 minutes. The primary outcome was achieved, the bleeding completely resolved in all 5 patients. There were no intervention related complications observed in any of the patients. The requirement of intensive care monitoring ranged from 2 to 4 days and total hospital stay varied from 8 to 14 days. Post-operatively, one patient complained of transient weakness in right leg and one developed vulval haematoma. None of the patients had fever or abdominal pain. The examination in the follow up at 6 weeks and one year after the procedure revealed no significant long term complications. One patient conceived 11 months following the procedure. None of the patients reported any alteration in the menstrual regularity or blood loss during follow up.

DISCUSSION

Our observations support the role of UAE as a safe effective alternative to surgery in management of PPH in sick and unstable postpartal women. The procedure appears to be less time consuming, poses less instability to haemodynamic status and is relatively free from long term complications [1]. However, availability of sophisticated equipment and well trained interventional radiologist are the key factors against the procedure to gain acceptance and popularity as first line modality for management of PPH. As our observations are limited to a small number of cases and do not include the follow up information beyond one year, caution should be exercised in extrapolating our findings and the decisions should be individualized on case to case basis.

There are several reports of use of selective arterial embolisation in management of PPH, various arteries embolised are uterine, vaginal, pudendal and ovarian in decreasing order of frequency [3-8]. All 5 of our patients were successfully managed with complete cessation of haemorrhage. The reported success rate in literature ranges from 83% to 100%. In our patients, mean interval between the onset of bleeding and the procedure of embolisation was close to 4 hours and the time required for the complete procedure was 40 to 50 minutes. The procedure appears to be successful even in the patients presenting later than 6 hours from the onset of bleeding. Extravasation of contrast in initial angiography is reported to be demonstrable only in half of the patients, short of which, most workers would prefer to devascularise bilateral vessels. Requirement of repeat sessions after initial failure appears to be an uncommon event. We used gelatin foam as embolising agent in our

patients; it has been most often used embolising agent for arterial revascularizations reported in the literature. In our series, there were no intervention related complications observed in any of the patients. The reported complications are local haematoma, pelvic pain, vaginal abscess and rarely small bowel infarcts and external iliac artery perforation [9,10]. Over one year follow up, no significant long term complications was observed among our patients. One patient conceived 11 months following the procedure. None of the patients reported any alteration in the menstrual regularity or blood loss during follow up, the two significant complications, reported in the literature [11,12].

In view of reasonably established efficacy and safety and the advantage of uterine preservation with UAE, it should be proposed as an alternative to surgery in patients with PPH.

REFERENCES

- [1] Anderson JM, Etches D. Prevention and management of postpartum haemorrhage. *Am Fam Physician*. 2007 Mar 15;75(6):875-82.
- [2] Roberts WE. Emergent obstetric management of postpartum haemorrhage. *Obstet Gynaecol Clin North Am*. 1995 ;22:283-302.
- [3] Vedantham S, Goodwin SC, McLucas B, Mohr G. Uterine artery embolization: an underused method of controlling pelvic haemorrhage. *Am J Obstet Gynaecol*. 1997;176:938-48.
- [4] Merland JJ, Houdart E, Herbretau D, et al. Place of emergency arterial embolisation in obstetric haemorrhage about 16 personal cases. *Eur J Obstet Gynaecol Reprod Biol*. 1996 ;65:141-43.
- [5] Devroede F, Petteau M, Luyx A, Fauconnier JP, Vermonden J, Gilbeau JP. Arterial embolisation of post-partum haemorrhage. *J Belge Radiol*. 1995;78:337-38.
- [6] Pelage JP, Le Dref O, Mateo J, et al. Life-threatening primary postpartum haemorrhage: treatment with emergency selective arterial embolization. *Radiology*. 1998 ;208:359-62.
- [7] Heffner LJ, Mennuti MT, Rudoff JC, McLean GK. Primary management of postpartum vulvovaginal haematomas by angiographic embolization. *Am J Perinatol*. 1985;2:204-07.
- [8] Hansch E, Chitkara U, McAlpine J, El-Sayed Y, Dake MD, Razavi MK. Pelvic arterial embolisation for control of obstetric haemorrhage: a five year experience. *Am J Obstet Gynaecol*. 1999; 180:1454-60.
- [9] Greenwood LH, Glickman MG, Schwartz PE, Morse SS, Denny DF. Obstetric and non-malignant Gynaecologic bleeding: treatment with angiographic embolization. *Radiology*. 1987;164:155-59.
- [10] Gilbert WM, Moore TR, Resnik R, Doemeny J, Chin H, Bookstein JJ. Angiographic embolization in the management of hemorrhagic complications of pregnancy. *Am J Obstet Gynaecol*. 1992;166: 493-97.
- [11] Yamashita Y, Harada M, Yamamoto H, et al. Transcatheter arterial embolization of obstetric and gynaecological bleeding: efficacy and clinical outcome. *Br J Radiol*. 1994;67:530-34.
- [12] Stancato-Pasik A, Mitty HA, Richard HM III, Eshkar N. Obstetric embolotherapy: effect on menses and pregnancy. *Radiology*. 1997;204:791-93.

AUTHOR(S):

1. Dr. Vishalakshi Urundady
2. Dr. Vrinda Shetty

PARTICULARS OF CONTRIBUTORS:

1. Consultant Gynaecologist AJHRC, Mangalore, India.
2. Consultant Gynaecologist, AJHRC, Mangalore, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Vishalakshi,
1003, Heritage Apartments, 7th Cross,
Gandhinagar, Mannagudda, Mangalore, India.
Phone: 9845888591
E-mail: drvishala@msn.com

FINANCIAL OR OTHER COMPETING INTERESTS:

None.

Date of Submission: [Jul 02, 2012](#)
Date of Peer Review: [Aug 10, 2012](#)
Date of Acceptance: [Aug 20, 2012](#)
Date of Online Ahead of Print: [Sep 10, 2012](#)
Date of Publishing: [Dec 15, 2012](#)