

# Angiographic embolization for intractable obstetrical bleeding

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## ABSTRACT

**Aims and Objectives:** The objective of this study is to review the clinical profile and outcome in patients requiring the angiographic embolization in obstetrics. **Methods:** The retrospective data of patients requiring uterine artery embolization for control of obstetrical hemorrhage was studied during the period from August, 2005 to August, 2010. **Results:** A total of 35 patients with obstetrical hemorrhage (seven post lower segment caesarean section, 13 post vaginal delivery, 13 postabortal, one with cervical pregnancy and one patient post laparotomy for abdominal pregnancy) underwent angiographic embolization for control of bleeding. In all patients, hemorrhage was successfully controlled; none required post procedure hysterectomy and one patient subsequently became pregnant with in a year. **Conclusion:** Our clinical experience suggests that embolization is superior first-line alternatives to surgery for control of obstetric hemorrhage including postpartum, post-cesarean and postabortal bleeding and prevents hysterectomy.

**Key words:** Obstetrical hemorrhage, uterine artery embolization, intractable bleeding

## INTRODUCTION

In obstetrics and gynecology angiographic embolization has been successfully used in patients with life-threatening intractable pelvic hemorrhage when routine medical and conservative methods of bleeding control have been tried and not found effective.<sup>[1-7]</sup> Management options available to treat intractable pelvic hemorrhage include: Hysterectomy, bilateral internal artery ligation and uterine artery embolization (UAE). Since embolization preserves the uterus and avoids the hazards associated with its removal, it is emerging as a preferred technique to arrest intractable obstetrical hemorrhage.<sup>[8]</sup>

## METHODS

We studied the clinical profile and outcome in 35 patients

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requiring UAE for intractable obstetrical hemorrhage over a period of five years (from August 2005 to August 2010).

All the procedures were performed under local anesthesia, percutaneous catheterization was done through the femoral artery, arteriogram taken to visualize the arterial arcade and catheter advanced in to uterine artery and artery occluded with polyvinyl alcohol particles 500-700  $\mu$ m and/or gel foam pledgets/coils. Check arteriogram was performed and the procedure repeated for contralateral uterine artery.

## RESULTS

There were seven post lower segment cesarean section (LSCS) cases out of which six patients were with secondary postpartum hemorrhage (PPH) including one case of placenta accreta and one patient with primary PPH; post vaginal delivery nine patients presented with primary PPH and four with secondary PPH, of these seven had atonic PPH, three were with coagulation abnormalities of which one was with puerperal sepsis, two had undergone manual removal of the placenta and one case with one traumatic PPH [Table 1]. In 13 patients, embolization was done for postabortal hemorrhage [Table 1]. Eight patients underwent UAE to control bouts of bleeding following repeated dilatation and curettage (D and Cs) for first trimester abortions, three patients had second trimester abortions and two patients with gestational trophoblastic disease (GTD) on chemotherapy with heavy bleeding

underwent UAE. All patients were hemodynamically unstable, but with normal coagulation profile except three which was simultaneously corrected,  $\beta$ hCG was sent in all patients with postabortal hemorrhage at admission to rule out GTD. UAE was done successfully in all patients followed by D and C in next 24 h if required. There was one patient with cervical ectopic pregnancy who underwent UAE followed by ultrasonography (USG) guided evacuation within 24 h of UAE with an uneventful post evacuation period. Another patient 35 years old G<sub>3</sub>P<sub>2</sub>L<sub>2</sub> with 35 weeks amenorrhea with abdominal pregnancy underwent laparotomy. 1.83 kg male baby was extracted as breech with immediate cry. Placenta was attached to bladder, omentum and uterus. Cord tied twice near placental attachment and cut Placenta was left inside. She underwent selective arterial embolization to prevent hemorrhagic complications. Day 15 post embolization no definite arterial flow was appreciated on USG and patient remained asymptomatic on follow-up.

Maximum number of women 42.86% were in the age group of 26-30 years [Table 2]. Nearly 37.14% women were primigravidas [Table 3].

We had 100% of success rate with no post procedure hysterectomy and there was no mortality. The requirement of blood products was significantly less post UAE ( $P = 0.006917$ ) in post vaginal delivery and ( $P = 0.000231$ ) in postabortal patients on paired  $t$ -test [Table 4]. The hospital stay was between 3 and 10 days.

A total of 17 patients had post embolization syndrome, which was managed with analgesics. One patient had groin hematoma, which was managed conservatively. This patient had abnormal coagulation profile. Normal menstruation resumed in 29 (82.3%) patients within 3 months. Four patients (11.4%) resumed menstruation within a year. Two patients were lost to follow-up. One patient conceived spontaneously within a year.

## DISCUSSION

PPH is a potentially serious obstetric complication and its management represents an issue of critical concern to an obstetrician. After failure of conservative local measures, such patients have traditionally been treated with bilateral hypogastric artery ligation or hysterectomy. Disadvantages of surgical treatment include significant failure rates for hypogastric artery ligation, the need for general anesthesia and surgical complications including infection, bleeding and ureteric injury.<sup>[1]</sup>

Transcatheter arterial embolization has recently emerged as a highly effective percutaneous technique for controlling acute and chronic

uterine/pelvic hemorrhage in a wide variety of obstetrical and gynecological conditions.<sup>[1-7]</sup> Benefits for the patient and health-care providers have included low complication rates, avoidance of surgical risks, fertility preservation and shorter hospital stay.

**Table 1: Causes of obstetrical haemorrhage requiring UAE**

Etiology	Number of patients
Post LSCS	7
Post vaginal delivery	13
Post abortal	13
Abdominal pregnancy	1
Cervical pregnancy	1
Total	35

UAE: Uterine artery embolization; LSCS: Lower segment caesarean section

**Table 2: Distribution according to age**

Age in years	No. of patients	Percentage
<20	1	2.86
20-25	13	37.43
26-30	15	42.86
31-35	6	17.14
Total	35	100

**Table 3: Distribution according to gravidity**

Gravidity	No. of patients	Percentage
1	13	37.14
2	11	31.43
3	9	25.71
4	1	2.86
5/>5	1	2.86
Total	35	100

**Table 4: BT requirement pre- and post-UAE**

Etiology	BT given before UAE (mean $\pm$ SD)	BT given after UAE (mean $\pm$ SD)	Paired student t test P value	Significance
Post LSCS	1.71 $\pm$ 2.06	0.42 $\pm$ 0.78	0.063336	NS
Post vaginal delivery	3.54 $\pm$ 2.07	1.36 $\pm$ 1.12	0.006917	S
Postabortal	1.73 $\pm$ 0.90	0.36 $\pm$ 0.67	0.000231	S
Abdominal pregnancy	1	1		
Cervical pregnancy	1	0		

UAE: Uterine artery embolization; SD: Standard deviation; BT: Been treated; LSCS: Lower segment caesarean section; S: Significant; NS: Not significant

**Table 5: Comparator studies for embolization in obstetrics and gynecology practice**

Authors	Journal	No. of patients	Success rate (%)
Greenwood et al.	Radiology 1987;164:155-9	08	100
Pelage et al.	Acta Obstet Gynecol Scand 1999;78: 698-703.	27	92
Chung et al.	J Reprod Med. 2003 Apr; 48 (4):268-76	33	94
Ojala et al.	Acta Obstet Gynecol Scand 2005; 84: 1075-1080	22	77
Our study	2013	35	100

One drawback of the procedure, though highly effective as demonstrated by the literature as well as confirmed by our experience is the risk of radiation as the procedure takes about 30 min with experienced hands at our center. The amount of radiation to ovaries during the procedure has been found to be: 22-66 cGy.<sup>[9]</sup> This is 30-100 times higher than those during conventional diagnostic radiographic examinations (hysterosalpingogram) yet it is much lower than the doses required for irradiation of malignancy. Return of normal menses occurs usually within 6 months. No adverse effects on fertility have been so far reported.<sup>[10]</sup> Our series though small, is also an indicator in the same direction.

## CONCLUSION

Our clinical experience suggests that embolization should be used before surgical treatment of pelvic bleeding in many clinical settings, including postpartum, post-cesarean and postabortal bleeding.

Some studies using embolization in obstetrics and gynecology practice have already been conducted [Table 5]. Results from our centre are better than many of the reported studies.

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