

Original Article

PRE-OPERATIVE BILATERAL UTERINE ARTERY CATHETERISATION AND INTRAOPERATIVE EMBOLIZATION IN PREVENTION AND TREATMENT OF HEMORRHAGE DURING CAESAREAN SECTION IN PLACENTA PREVIA – A CASE SERIES IN A TERTIARY CARE HOSPITAL

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ABSTRACT

BACKGROUND: Placenta previa is defined as complete or partial covering of cervical internal os with the placenta. Placenta previa is a major risk factor for obstetric haemorrhage. Uterine artery embolization (UAE) reduces blood flow to the lower uterine segment which helps to reduce blood loss during placental separation.

OBJECTIVE: Though UAE is a well-established modality to reduce obstetric hemorrhage, we will explore success, benefit and complications of UAE in placenta previa patients.

METHOD: This is a case series. We have collected data from 1st October, 2017 to 31st December, 2017 at Department of Obstetrics and Gynecology, Command Hospital (Eastern Command) Kolkata.

RESULTS: In our study, we performed UAE in the five patients with placenta previa.

Mean operative blood loss was 1100 ml. We found 60% success in UAE and only 40% patient required blood transfusion. In our study no patient required hysterectomy. All patients were discharged without any mortality and morbidity.

CONCLUSION: UAE is technically demanding, require specially trained interventional radiologist in a properly equipped radiology suit. In those facilities, uterine artery embolization can be helpful to patients who wish to preserve fertility but have high risk for obstetric hemorrhage during cesarean section.

KEY WORDS: Placenta previa, Haemorrhage, Uterine artery embolization

INTRODUCTION

Placenta previa is defined as complete or partial covering of cervical internal os with the placenta ¹. The exact pathophysiology is unknown but uterine scarring is a potential risk factor. Other important risk factors for placenta previa include advanced maternal age, high parity and history of placenta previa ^{2, 3, 4}. Incidence of placenta previa is 3-5 per 1000 pregnancy ⁵. This rate is expected to increase in the coming years due to high rate of caesarean deliveries and subsequently more pregnancies with uterine scarring.

Obstetrical hemorrhage is the leading cause of maternal morbidity and mortality worldwide ⁶. Placenta previa is a major risk factor for obstetric haemorrhage ⁷. This is strongly associated with higher risk of intraoperative bleeding and postpartum haemorrhage (PPH), which leads to more need of blood transfusion and further surgical procedures like devascularisation and emergency hysterectomy ⁸.

Uterine artery embolization (UAE), first described by Brown et al in 1979 is a highly specialized and efficacious method that can be used both prophylactically and therapeutically to reduce hemorrhage during C-Section in Placenta previa. Reduction of blood flow to the lower uterine segment by UAE helps to reduce blood loss during placental separation. Effectiveness of UAE is very high; a recent review reported a more than 90 % success rate ⁹.

Though it is a well-established modality in reducing bleeding in placenta previa, UAE is not always successful, and various factors are

associated with the failure ¹⁰. In this case series we will explore success, benefit and complications of UAE in our institute.

MATERIALS NEED METHODS

Before surgery, written and informed consent are taken. Patients were taken to Cath Lab fitted with a moveable C-arm equipped with digital subtraction angiography. A 6F sheath was placed in the right common femoral artery using Seldinger technique under local anaesthesia. Selective catheterization of the left uterine artery was performed with a 5F COBRA- C1 catheter. Same procedure done from left common femoral artery to catheterize right uterine artery.

After the infant has been delivered and the umbilical cord clamped post caesarean, the obstetrician clipped any bleeding vessels using haemostatic forceps and packed the vagina and the uterus with the placenta still in situ. Under fluoroscopic guidance, the left uterine artery was embolized first, following which the right uterine artery was embolized with Gelform sponge pledges mixed with contrast medium. Both uterine arteries were embolized until there was adequate stasis, and the catheter and sheath were kept stationary in case further embolization was necessary. The complete placenta was removed manually from the uterine wall.

After closing the uterine lumen and abdominal cavity and observing no vaginal bleeding, the angiocatheter was removed under fluoroscopic guidance. The puncture point of the right femoral artery was compressed for haemostasis. Intra operative blood loss recorded.

TABLE 1: Five Cases

	Case 1	Case 2	Case 3	Case 4	Case 5
Age of patient	28	26	28	31	26
Gravid and parity	Primi	primi	Primi	Primi	Gravida2 parity 1
POG at admission	36wk 02 day	28wk 05 day	33wk 01d	35wk 05d	37wk 06d
USG	SLIUG @33w06d, Complete Placenta Previa	SLIUG @27w04d, Complete Placenta Previa	SLIUG @32w05d, Complete Placenta Previa	SLIUG @35w03d, Complete Placenta Previa	SLIUG @37w02d, Complete Placenta Previa
POG at termination	38wk	33wk	37wk	38wk	36wk
Undergone	UAE and elective LSCS on 26.08.15	UAE and elective LSCS on 28.11.15	UAE and elective LSCS on 30.04.16	UAE and elective LSCS on 14.01.17,	UAE and elective LSCS on 27.01.17
Further Intervention	Not Required	Not Required	B/L uterine artery pedicles and B/L cornual vessels ligated with uterine packing	B/L uterine artery pedicles and cornual vessels ligated, B/L Internal Iliac Artery ligation	Not Required
Pre op Hb	11.3 gm %	12.1 gm %	11.2 gm%	11.4 gm%	13.2 gm%
Intraoperative blood loss	1000ml	900ml	1200ml	1800ml	600ml
Hb after OT	7.9 gm%	9.5 gm%	7.0 gm%	6.7 gm%	11.6 gm%
Transfusion required	-	-	1 PRBC 1 FFP 1 Platelet	4 PRBC 4 FFP 2 Platelet	-
Hb Post op day 2	8.1 gm%	10.0gm%	8.5gm%	10.2gm%	12.0gm%

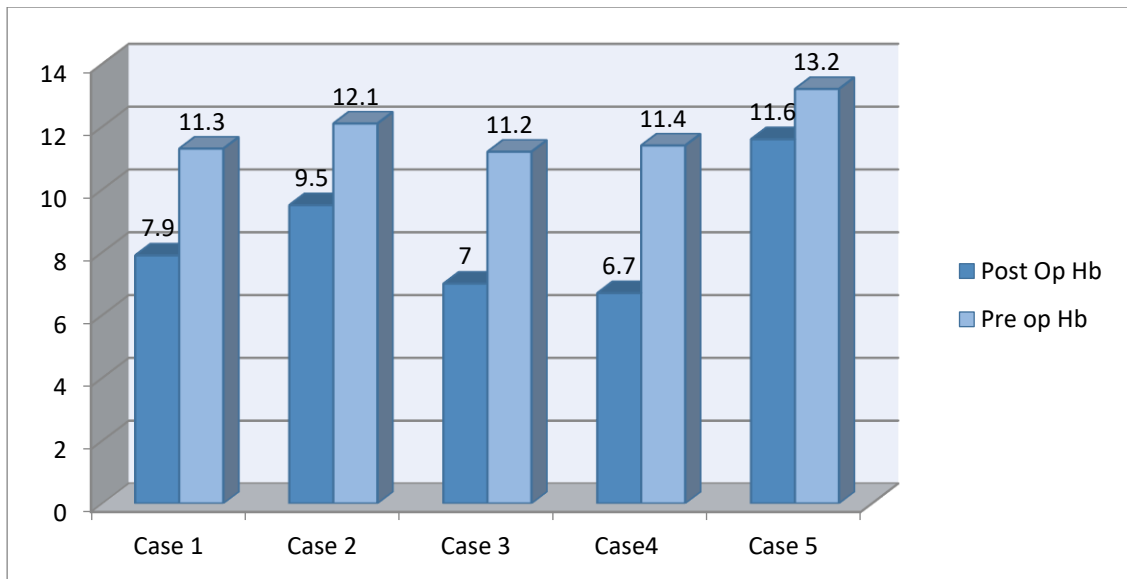


Diagram 1: Bar Diagram showing Pre- and Post-operative Hemoglobin (Hb) of 5 cases

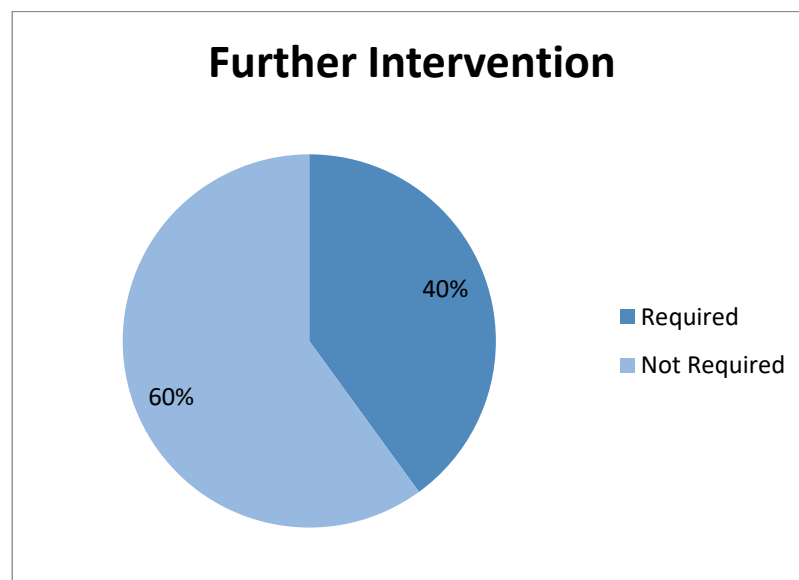


Diagram 2: Pie Diagram Showing requirement of further intervention in five cases

DISCUSSION

In this study, we performed UAE in the five patients with placenta previa. Mean age was 27.8 years (27.8 ± 1.796 at CI 95%) among them 4 (80%) patients were primigravidae and 1(20%) patient was 2nd gravidae. Two patients (40%) delivered preterm baby and 3(60%) delivered term baby; mean period of gestation was 36 weeks (36.2 ± 1.796 at CI 95%). As Case no 2 had uncontrolled severe pre-eclampsia and Case no 5 had scar

tenderness they were taken for C-section and delivered preterm baby.

Mean operative blood loss was 1100 ml ($1,100 \pm 392$ at CI 95%) which is more compared to Sanad et al (2018) study (805.1 ± 224.5) 11, probable reason maybe they ligated uterine artery before uterine incision. Out of our five cases, two patients required further intervention to control hemorrhage. We found UAE is 60% successful which is low compared to 90% recited by other authors 9, 12.

Among 5 patients only 2(40%) patients required blood transfusion compared to 46% found by Tuzovic, L 13. In our study no patient required hysterectomy compared to 2.85% found by Santosh Kumari 14 and no patient developed AKI or DIC. During post-operative period one patient had post-operative fever and one patient complained of numbness at buttock and thigh, both patients recovered spontaneously. All patients were discharged without any mortality and morbidity.

Though our study population was less, we can clearly assume that prophylactic UAE significantly reduce intraoperative blood loss which significantly improve peripartum outcome of these high-risk pregnancies.

However, some concerns remain, as to the long-term effect of UAE on the uterine and ovarian blood supply as well as radiation exposure to the ovaries from the use of fluoroscopy during the procedure and its impact on future fertility. Radiation exposure during fluoroscopy were kept below 150 mGy as per National Council on Radiation Protection and Measurement guideline 15 but long-term effect on neonate is yet to be evaluated.

CONCLUSION

There has been ample research supporting the efficacy of UAE to control severe PPH before surgical intervention. UAE is technically demanding, requiring specially trained interventional radiologist in a properly equipped radiology suit.

A set up where facilities for endovascular catheterization are available, uterine artery embolization can be helpful to a patient who is high risk for hemorrhage during cesarean section in placenta previa and wishes fertility preservation. In the hands of a skilled interventional radiologist, it can be used as the procedure of choice in this setting.

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