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Original Research Article

Internal iliac artery ligation to combat post partum haemorrhage: an institutional review of case series

Anushree Jain*, Rekha Uttam Sapkal

Department of Obstetrics and Gynecology, People's College of Medical Sciences and Research Centre, Bhopal, Madhya Pradesh, India

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***Correspondence:**

Dr. Anushree Jain,

E-mail: anushree.jain10@gmail.com

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ABSTRACT

Background: Internal iliac artery supplies the pelvic viscera. IIAL is a valuable surgical procedure to control intractable pelvic haemorrhage with the mainstay aim of uterus preservation. There is a reduction of 85% in pulse pressure and 48% in the blood flow in the arteries distal after internal iliac artery ligation. Thus, the expertise to perform IIAL should be present in armamentarium of every obstetrician and gynaecologist.

Methods: Retrospective review of 22 cases who have undergone IIAL or Peripartum hysterectomy for management of Post- Partum haemorrhage in the study period of January 2012 till December 2015 in the Department of Obstetrics and Gynaecology of People's College of Medical Science and Research Centre, Bhopal.

Results: Internal iliac artery ligation was performed in 53% out of which 31.8% was for placenta previa, 4.54% for adherent placenta, 9.1% IIAL for Atonic PPH. Whereas peripartum hysterectomy was performed in 38% cases out of which 13.6% had perforation of uterus. 9% underwent hysterectomy as well as IIAL. Blood loss more than two 2 liters within period of 60-90mins was effectively and dramatically controlled with IIAL. Thus, maternal mortality reduced while preserving fertility. Control of Pelvic hemorrhage was achieved in 100% of cases.

Conclusions: Bilateral ligation of the internal iliac arteries is a safe, rapid and very effective method of controlling bleeding from UTERUS and genital tract. It plays a major role in safe guarding the patient from undergoing life threatening consequences due to pelvic haemorrhage.

Keywords: Internal iliac artery ligation, Peripartum hysterectomy, Postpartum haemorrhage, Uterus preservation

INTRODUCTION

Postpartum haemorrhage (PPH) is a major cause of worldwide maternal mortality ranging from 13% in developed countries to 34% in developing countries.¹ It is reportedly responsible for over 125 000 maternal deaths each year and is associated with morbidity in 20 million women per year.² Post-partum haemorrhage is definitely a nightmare for all obstetricians. Uterine atony is the commonest cause of PPH that accounts for 80% of cases.³ Known risk factors for occurrence of PPH include

a history of PPH, history of retained placenta, placental abruption, placenta previa, PIH, GDM, uterine fibroids, hydramnios, and multiple pregnancies, augmentation of labour, prolonged labour and difficult or failed instrumental delivery, cervical and vaginal lacerations. There is danger of extension of c section incision either in broad ligament or to cervix. Where the site of operation is difficult to reach for prompt haemostasis.

Major PPH or loss of over 1000 ml of blood occurs in 1-5% of deliveries. When PPH continues despite aggressive

medical treatment, early consideration should be given to surgical intervention. The choice of procedure will depend on the parity of the women and her desire for childbearing, the extent of hemorrhage and, most importantly, the experience and judgement of the surgeon.

In most catastrophic situations, hysterectomy is preferred as a first choice in order to arrest further blood loss. Although a life-saving procedure, it may not be appropriate for women who need to preserve their reproductive potential.

Hemostatic procedures that preserve the uterus include uterine cavity tamponade, selective uterine artery embolization, uterine artery ligation and uterine brace sutures. Internal iliac artery ligation (IIAL) has been advocated as an effective means of controlling intractable PPH and preventing maternal death. Following ligation of anterior branch of internal iliac artery, there is a reduction of 85% in pulse pressure and 48% in the blood flow in the arteries distal to the ligation.^{4,5} It is also helpful in controlling massive broad ligament hematoma. Here we have reviewed the case series of patients who underwent IIAL and or peripartum hysterectomy for the control of post-partum haemorrhage. Hence the main aim of this study is to identify and analyse the clinical conditions where there is need for any of surgical method to control the blood loss. Thus, effectiveness of Internal iliac artery ligation was analysed.

METHODS

Retrospective review of case series conducted in the Department of Obstetrics and Gynaecology of People’s College of Medical Science and Research Centre, Bhopal during the study period from January 2012 to December 2015. It included all the 22 women who have undergone IIAL or Peripartum hysterectomy for management of Post-Partum haemorrhage. The cases were studied under various variables such as parity and gestational age, mode of delivery was documented.

Amount of blood loss (millilitres) and duration to control PPH by IIAL or peripartum hysterectomy was analysed. Additional variables studied were complications like shock, septicaemia, Disseminated Intravascular Coagulopathy, deep vein thrombosis, renal failure, liver failure, electrolyte imbalance and Post-operative duration of hospital stay.

RESULTS

Out of 22 case studies maximum cases belonged to 4th para accounting to 41% who underwent IIAL for the management of PPH followed by 2nd para contributing to 22.70%. Other cases belonged to primipara, 3rd, 5th and 6th para contributing to 9.10% respectively (Table 1).

Table 1: Parity distribution observed in this study.

Parity	No. of cases	%
Primigravida	2	9.10
2 nd gravida	5	22.70
3 rd gravida	2	9.10
4 th gravida	9	41
5 th gravida	2	9.10
6 th gravida	2	9.10

In this study 86% affected patients were from the pre-term group. Whereas the pre-viable group also contributed 14% (Figure 1).

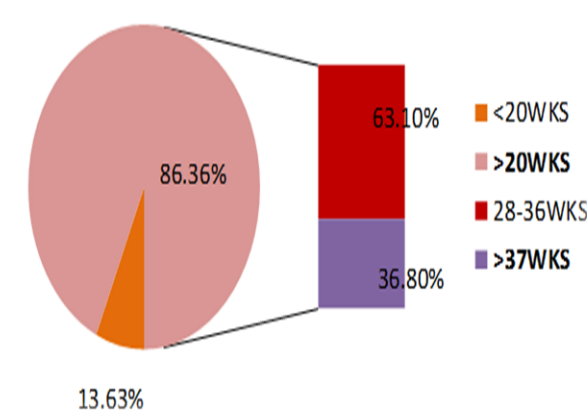


Figure 1: PPH observed at pre-viability and viable gestation.

Table 2: Mode of delivery.

Mode of delivery	No. of cases	Lial	Hysterectomy
LSCS	12		
Emergency	10	10 (45.5%)	2 (9%)
Elective	2	2 (9%)	0
Vaginal delivery	5		
FTND	4	0	4 (18%)
PTVD	1	0	1 (4.5%)
Abortion	2	2 (9%)	0
Laprotomy	3	2 (9%)	1 (4.5%)

Amongst all the 22 cases the indications of IIAL are placental causes like placenta previa accounting to 31.8%, placenta accreta 4.54%. Post-partum haemorrhage caused after delivering of intrauterine dead foetus (IUFD) and malpresenting foetuses also required IIAL in 9.1% cases.

Other causes with significant contributions were ectopic pregnancy, abortions and PPH occurring in previous caesarean sections accounting to 4.54% respectively (Table 2).

In contrast, indications for Peripartum hysterectomy were ruptured uterus (13.63%), post-partum haemorrhage (9.1%), placenta percreta, accreta and IUFD resulting in 4.54% respectively (Table 2).

Out of 22 cases there were 5 vaginal deliveries and 2 emergency LSCS cases required obstetric hysterectomy to control postpartum hemorrhage. Whereas in 2 elective LSCS bleeding was controlled with IIAL only. Effective control was observed in 45- 90 minutes (Table 3).

Table 3: Blood loss and need of IIAL/ hysterectomy.

Blood Loss	Hysterectomy	IIAL
>1500ml	5 (23%)	13 (59%)
1000 ml – 1500ml	4 (18%)	2 (9%)

In the given scenario, the amount of blood loss more than 1500ml, in 59% cases the decision of IIAL was effective. Whereas where the blood loss less than 1500ml, hysterectomy was tried initially in 9% cases but was followed by IIAL (Table 4).

Table 4: Time lapsed in performing the procedure.

Time Lapsed	Hysterectomy	IIAL
>90mins	5 (23%)	8 (53%)
45 – 90mins	4 (18%)	6 (40%)
<45mins	0	1 (7%)

In 7% cases the bleeding was profuse over 45mins where IIAL was effective. In 40%cases blood loss was over 90mins where hemostasis could not be achieved. Hence, 23% cases underwent hysterectomy where as 53%cases had IIAL (Table 5).

Table 5: Management to control PPH.

Procedure	No. of cases
Bilateral internal iliac artery ligation	14 (64%)
Unilateral internal iliac artery ligation	1 (5%)
Subtotal hysterectomy	9 (41%)
IIAL and Subtotal hysterectomy	2 (9%)

All the registered cases were initially managed medically but it failed to control the intractable haemorrhage and 100% success was achieved by IIAL or peripartum hysterectomy (Table 6).

DISCUSSION

As per the observations it was found that increasing parity was more prone to land up with PPH i.e. In our study amongst 22 cases were reviewed and Internal iliac artery ligation was performed in 53% cases and had 100% efficient result whereas hysterectomy was performed in 38% cases. 9% underwent hysterectomy as well as IIAL.

Table 6: Indications for IIAL or post-partum hysterectomy.

Indications	No.	IIAL	Hysterectomy
Malposition	2	2 (9.1%)	-
Previous LSCS	1	1 (4.54%)	-
Ectopic pregnancy	1	1 (4.54%)	-
PPH	2	-	2 (9.1%)
Ruptured uterus	3	-	3 (13.63%)
Abortion	1	1 (4.54%)	-
Placenta			
Previa	7	7 (31.8%)	-
Accreta	1	1 (4.54%)	1 (4.54%)
Percreta	1	-	1 (4.54%)
IUF	3	2 (9.1%)	1 (4.54%)

Joshi VM conducted a study titled internal iliac artery ligation for arresting postpartum haemorrhage, March 2007.⁶ In this study out of 60 selected patients 15 underwent unilateral ligation and 45 underwent bilateral ligation. Haemorrhage was effectively controlled in 53 cases. Evsen MS et al conducted a study titled Internal iliac artery ligation for severe postpartum haemorrhage.⁷ In this study out of 110 patients registered hysterectomy was performed in 39.3% cases and thus, early resort to IIAL effectively prevents hysterectomy.

In this study, it was observed that blood loss more than or equal to 2 liters within period of 60-90 minutes had IIAL effective in preventing the women fertility as well as mortality.

Whereas 36.34% IIAL was done for placenta previa and adherent placenta. 18.2% IIAL for Atonic PPH. 3 cases were little outstanding for pelvic haemorrhage with uterine rupture because of cornual pregnancy and other because of post Dilatation and Curettage uterine perforation and one with uterine inversion. Refae W conducted a study on prophylactic bilateral internal artery ligation for management of low-lying placenta accreta: a prospective study. Bilateral internal iliac artery ligation was performed in patients with invasive placenta (accreta and increta) (46/51=90.1%) and satisfactory haemostasis was achieved in 38 patients (38/46=82.6%).⁸ In five patients with placenta previa increta (5/17=29.4%), there was uncontrolled blood loss; thus, we proceeded to caesarean hysterectomy.

The mean intraoperative blood loss was 1255±589 ml. Blood transfusion was necessary in 35 patients (35/46=76%) during the operations.

In this study mortality was observed in 1 case (5%) associated with couvelier uterus and post obstetric hysterectomy because of Disseminated Intravascular Coagulopathy and multiorgan dysfunction syndrome after 30 days of surgery. Control of Pelvic haemorrhage was achieved in 100% of cases.

CONCLUSION

This is one of the most effective procedures to save women's life from intractable pelvic hemorrhage. Further prevents them from undergoing hysterectomy and its related consequences. IIAL is effective in combating pelvic haemorrhage in a short span of time is lifesaving in 100% cases. Hence, the duration as well as the amount of blood loss governs the prompt decision in favor of IIAL. It is truly recommended to befriend with IIAL because of its high efficiency and better prognosis.

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REFERENCES

1. Khan KS, Wojdyla D, Say L, Gulmezoglu AM, Van Look PF. WHO analysis of causes of maternal death: a systematic review. *Lancet*. 2006;367:1066-74.
2. Selo-Ojeme DO. Primary post-partum haemorrhage. *J Obstet Gynecol*. 2002;22:463-9.
3. Arulkumaran S, De Cruze B. Surgical management of severe postpartum haemorrhage. *Curr Obstet Gynecol*. 1999;8:101-5.
4. Siegel P, Mengert WF. Internal Iliac Artery Ligation in Obstetrics and Gynecology. *JAMA*. 1961;178(11):1059-62.
5. Burchell RC. Physiology of internal iliac artery ligation. *BJOG: An International J Obstetr Gynaecol*. 1968;75(6):642-51.
6. Joshi VM, Oti SR, Majumder R, Nikam YA, Shrivastava M. Internal iliac artery ligation for arresting postpartum haemorrhage; *BJOG*. 2007;114(3):356-61.
7. Siddik EM, Erdal SM, Ender SH, Serdar B, Cetin B, Sibel S, Talip G. Internal iliac artery ligation for severe postpartum hemorrhage. *Ginekol Pol*. 2012;83:665-8.
8. Refaie W, Fawzy M, Shabana A. Prophylactic bilateral internal iliac artery ligation for management of low-lying placenta accreta: a prospective study. *Tanta Med J*. 2014;42:146-50.

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