

Emergency internal iliac artery ligation: Role in prevention of obstetric hysterectomy and maternal death

Ganesh R Tondge¹, Ranjana Phad^{2*}

^{1,2}Associate Professor, Department of OBGY, SRTR Government Medical College, Ambajogai, Beed, Maharashtra, INDIA.

Email: tganesh2015@gmail.com

Abstract

Postpartum haemorrhage in obstetrics is the leading cause of maternal mortality in India. Emergency internal iliac artery ligation is one of the lifesaving procedures in intractable PPH. This is a retrospective review of emergency internal iliac artery ligations done over a period of 2 years. A total of 16 emergency internal iliac artery ligations were done. Additional treatment procedure required was hysterectomy to control the haemorrhage. Intra and post operative complications were noted. A comparative review of the effectiveness of emergency internal iliac artery ligation in different situations is done. Conclusion was that early resort to emergency internal iliac artery ligation effectively prevents hysterectomy in patients with traumatic and atonic PPH. Emergency internal iliac artery ligation facilitates hysterectomy or repair as indicated and prevents reactionary haemorrhage.

Key Words: obstetric hysterectomy, maternal death.

*Address for Correspondence:

Dr. Ranjana Phad, Associate Professor, Department of OBGY, SRTR Government Medical College, Ambajogai, Beed, Maharashtra, INDIA.

Email: tganesh2015@gmail.com

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INTRODUCTION

Obstetrics is bloody business¹. Commonest cause of obstetric hysterectomy and maternal death in India is still obstetric haemorrhage. Obstetric haemorrhage contributes to 38% of all maternal deaths². Among 38%, PPH contributes to 25% of maternal deaths. PPH is not only major killer but it is fastest killer of mother. It kills mother within a period of 2 hrs. PPH is multifactorial. PPH is unpredictable and unpreventable but death due to PPH is preventable if delay is avoided. Pelvis is highly vascular especially during pregnancy and postpartum period. It has extensive collateral circulation. Obstetric

haemorrhage management poses real threat to the managing obstetrician. Sir Howard Kelly (1893) was the first person to perform emergency internal iliac artery ligation. Mengert and Burchell³ later popularised this. It is one of the procedure used to control pelvic haemorrhage. Emergency internal iliac artery ligation has been advocated as an effective means of controlling intractable PPH and preventing obstetric hysterectomy and maternal death. The rationale for this is based on hemodynamic studies of Burchell³ which showed that emergency internal iliac artery ligation reduced pelvic blood flow by 49% and pulse pressure by 85% resulting in venous pressures in arterial circuit thus promoting haemostasis. However reported success rate of emergency internal iliac artery ligation varies from 40 to 100%^{4,5}. Failure was more evident in atonic PPH⁶ in cases of preeclampsia, abruption, coagulopathy. So success rate of emergency internal iliac artery ligation depends on the cause of PPH and this procedure avoids hysterectomy in 50-70%⁷ cases. Emergency internal iliac artery ligation is thought to be technically difficult. Although much quicker than obstetric hysterectomy it is seldom attempted. We present a case series of emergency internal iliac artery ligation performed over 2 years at our

institution and define the role of emergency internal iliac artery ligation for various indications in obstetrics.

MATERIALS AND METHODS

Between June 2015 to March 2017 a total 16 emergency internal iliac artery ligation were performed as life saving procedure along with uterine, ovarian artery ligation, B' lynch sutures or obstetric hysterectomy as and when required. Women with PPH at vaginal delivery and caesarean section were first treated with uterine massage, cervicovaginal exploration and uterotronics such as oxytocin, misoprostol, methergin and carboprost at regular intervals. Failure to restore the uterine tone and control bleeding with these measures led to the decision of emergency internal iliac artery ligation. In the procedure to do emergency internal iliac artery ligation after opening the abdomen ureter was identified at the pelvic brim. The peritoneum was incised starting from a point just proximal to the bifurcation of the common iliac artery proceeding caudally along the external iliac artery for a length of about 8 cm. Using gentle finger dissection, ureter was retracted medially exposing the retroperitoneal anatomy. Using a long artery forcep the fascia around the internal iliac artery was dissected completely to free the artery from the adjacent structures. A mixter was passed beneath the internal iliac artery from lateral to medial side 4 cm distal to its origin. As the posterior division usually branches of proximal to this no attempt was made to locate it. Using vicryl no 1 internal iliac artery was ligated singly. Pulsations of femoral artery and dorsalis pedis artery were confirmed after ligation. In cases of PPH once emergency internal iliac artery ligation was performed the control of haemorrhage was confirmed by improvement in vital signs and decrease in vaginal bleeding. If bleeding still continued decision of hysterectomy was taken.

OBSERVATIONS AND RESULTS

During the period of 2 years, from 2015 to 2017, total of 16 emergency internal iliac artery ligations were performed.

Table 1: Indications for emergency internal iliac artery ligation

Indications	No of women
Atonic PPH	8
Genital tract injury (pelvic hematoma, vaginal lacerations)	3
Placenta previa	1
Abruptio with coagulopathy	3
Adhesions	1

Uterine atony was the most common indication for emergency internal iliac artery ligation.

Table 2: Indications of obstetric hysterectomy in patients who underwent emergency internal iliac artery ligation for PPH

Indications	No of Women	Hysterectomies Carried Out	Uterine Salvage Rate
Uterine atony	8	1	87.5%
Genital tract injury	3	0	100%
Placenta previa with accrete	1	1	0%
Abruptio with coagulopathy	3	2	33%
Adhesions	1	0	100%

Out of 16 emergency internal iliac artery ligations, 4 patients required obstetric hysterectomy. Among them 2 were for abruptio and coagulopathy

Table 3: Timing of emergency internal iliac artery ligation and uterine salvage rate in PPH (atonic and traumatic)

Timing	No of Women	Obstetric Hysterectomy	Uterine Salvage Rate
At LSCS	9	3	66.6%
Laparotomy after vaginal delivery	7	1	85.71%
Relaparotomy for LSCS	0	0	0

Time interval between the onset of haemorrhage due to atony and emergency internal iliac artery ligation influenced the uterine salvage rate.

Table 4: Complications of procedure

Complications	No of Women	% Of Complications
Injury to adjacent structure	0	0
Wrong ligation of structure (common iliac artery, ureter, external iliac artery)	1	6.25%
Ischemic complications e.g. gluteal paraesthesia	1	6.25%
Failure to control haemorrhage	4	25%
Failure to prevent maternal death	2	12.50%

DISCUSSION

After ligation circulation in parts supplied by internal iliac artery would be carried on by the anastomosis of 1) uterine and ovarian arteries 2) middle and superior vesical arteries 3) iliolumbar with the last lumbar arteries 4) lateral sacral with middle sacral arteries. Burchell has put forward the mechanism for control of pelvic haemorrhage following ligation of internal iliac arteries without compromising the blood supply as described earlier. Reich and Nechtor^{7,8} have emphasized that the biggest pitfall in performing emergency internal iliac artery ligation is waiting too long to perform it. Dalvi *et al*⁹ and Chattopadhyay *et al*⁶ reported 25% and 34% failure rates of emergency internal iliac artery ligation. Stephen and Patrician¹⁰ on the other hand have found the procedure effective in atonic PPH and have found 50% failure rate in placenta accreta and uterine tears. Joshi and colleagues¹¹, studied the role of bilateral internal iliac

artery ligation in the management of atonic PPH. In their study 36 women with atonic PPH were included. They found bilateral internal iliac artery ligation was effective to control PPH in 63.88% of studied cases and 36.11% of studied cases required emergency hysterectomy to control uterine bleeding. Camuzcuoglu *et al*¹² studied the role of internal iliac ligation to control severe PPH in 33 women. 24 women underwent bilateral internal iliac artery ligation as the primary surgical intervention and was effective to control PPH in 75% cases. In this study there were no intraoperative or postoperative complications related to internal iliac artery ligation.

CONCLUSION

Emergency internal iliac artery ligation is useful in treatment and prevention of PPH from any cause. Early resort to emergency internal iliac artery ligation prevents obstetric hysterectomy and thereby maternal death^{7,8}. It becomes first choice in traumatic PPH (pelvic hematomas, broad ligament hematoma, vaginal lacerations, deep forniceal tear) but it is less effective in PPH due to coagulopathy. Emergency internal iliac artery ligation is a procedure which every obstetric practitioner should be able to perform as this may be uterus/ life saving procedure. This should be tried before directly going to obstetric hysterectomy in almost all patients of PPH. Early resort to emergency internal iliac artery ligation effectively prevents hysterectomy in women with traumatic and atonic PPH. Emergency internal iliac artery ligation facilitates hysterectomy¹³ or repair as indicated and prevents reactionary haemorrhage. So every resident must be exposed to this procedure.

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