



Emergency bilateral internal iliac artery ligation in massive obstetric haemorrhage: 5 years experience At Tertiary Care Hospital.

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Article received on:
25/11/2019

Accepted for publication:
18/05/2020

ABSTRACT... Objectives: To study the efficacy and safety of emergency bilateral internal iliac artery ligation (BIAL) in arresting massive obstetric haemorrhage. **Study Design:** Retrospective study. **Setting:** Department of Obstetrics and Gynaecology Unit-I, Allied Hospital, Faisalabad. **Period:** January 2014 to December 2018. **Material & Methods:** Fifty eight (58) patients with obstetric haemorrhage were included in this retrospective study. Bilateral internal iliac artery ligation was performed to control massive postpartum haemorrhage, post-operative internal haemorrhage. **Results:** The fifty eight (58) women underwent BIAL. Booked cases were only (27%) and (73%) were unbooked. Out of 58 women 16(27%) women were with morbid adherent placenta, 14(24%) with uterine atony, 11(19%) uterine rupture, 9(17%) post-operative internal haemorrhage and 8(13%) coagulopathy were underwent BIAL. Out of 58 women 15(36%) ended in hysterectomy because of failure to control bleeding and uterus preserved in (64%). Overall efficacy in term of saving maternal life was 90%. One women had ureteric injury that was managed by Urologist. One another patient required re-laparotomy for persistent internal haemorrhage. **Conclusion:** Bilateral internal iliac artery ligation is safe and effective technique to control massive obstetric haemorrhage. Timely decision is also important to prevent hysterectomy. BIAL should include in algorithm to control intractable obstetric haemorrhage and consultant obstetricians and gynaecologist should learn that technique.

Key words: Internal Iliac Artery Ligation, Obstetric Haemorrhage, Saving Maternal Life and Uterus.

Article Citation: Saleem S, Tahira T, Javed N, Tahir S. Emergency bilateral internal iliac artery ligation in massive obstetric haemorrhage: 5 years experience At Tertiary Care Hospital. Professional Med J 2020; 27(12):2691-2695.
<https://doi.org/10.29309/TPMJ/2020.27.12.4360>

INTRODUCTION

Obstetric haemorrhage is still one of the five leading causes of maternal morbidity and mortality.¹ Postpartum haemorrhage is main contributing reason. Its prevalence is between 1-5% of all deliveries.² Massive haemorrhage after child birth occurs in 1-2/1000 deliveries.^{3,4} Approximately 140,000 women are dying each year worldwide.⁵ Overall haemorrhage contributes for 27% of all maternal deaths.⁶ Some patients with massive obstetric haemorrhage are those who developed internal bleed after obstetrical hysterectomy or caesarean section. Prompt surgical intervention not only save the maternal life but also her uterus. Ligation of internal iliac arteries is recognized as one of the best technique to control profuse obstetric haemorrhage and considered as a life saving procedure. Bilateral internal iliac artery

ligation does result in significant decrease (49%) in blood supply to pelvic organs.⁷ The efficacy of this procedure in avoiding hysterectomy for massive postpartum haemorrhage has been reported in one study is upto 50%⁸ and will control pelvic haemorrhage in 75% of cases.⁹ Internal iliac (hypogastric) artery ligation was started by and of 19th century to control massive haemorrhage from uterus with advanced cervical cancer.¹⁰ Since that time on, it has been a mainstay of controlling intractable obstetric haemorrhage.

Complication of Bilateral Internal Iliac artery Ligation (BIAL)s include damage to internal iliac vein and ureter. Tissue edema, ongoing haemorrhage and presence of atonic uterus may be the contributing factors. It may also result in

accidental ligation of external iliac artery but this is safe procedure in experienced hands. So bilateral inferior hypogastric artery ligation should be taught during obstetric and gynaecologic training, or at least one member of oncall team should be experienced. The present study aimed to share our experience in regarding the usefulness and safety of internal iliac artery ligation in control of massive pelvic haemorrhage.

MATERIAL & METHODS

The study was carried out from January 2014 to December 2018 in Gynaecology Unit-I of Allied Hospital, Faisalabad Medical University (FMU), which is a tertiary care centre dealing complicated and high risk case and referrals. The data of all these patients were filled on proforma who underwent internal iliac artery ligation. The demographic characteristics and clinical data including age, parity, gestational age, mode of delivery, reason of postpartum haemorrhage or internal haemorrhage, need of additional surgical procedure, number of blood transfusions and associated morbidity and mortality were recorded.

Surgical Techniques

The surgical technique for bilateral hypogastric artery ligation is quite easy for gynaecological oncologist and experienced surgeon, as they are familiar with the anatomy of the lateral pelvic wall. In our study all are done by experienced surgeon on call that day, which is decided by consultant obstetrician operating and dealing massive pelvic haemorrhage. The parietal peritoneum picked up and divided at lateral pelvic wall at the level of pelvic brim. Ureter was identified as it crosses the common iliac vessels and reflected medially. The right hypogastric (internal iliac) artery was traced from above downwards until it divides into anterior and posterior divisions. The anterior division is ligated by passing right angle clamp from lateral to medial with double strand absorbable suture (vicryl# 1) at least 3 cm distal to bifurcation³³. The same procedure is repeated on left side internal iliac artery. The femoral pulses were palpated at the completion of BIAL. Efficacy of BIAL was determined in term of controlling bleeding, conservating uterus and saving maternal lives. The intra-operative/post-operative complications,

admission to intensive care unit, number of blood transfusions and component therapy were noted. The collected data were entered for statistical analysis.

RESULTS

In this study period from January 2014 to December 2018, total number of deliveries conducted in gynaecology and obstetrics unit Allied Hospital Faisalabad were sixty one thousand & four hundred. Fifty eight patients presented with severe postpartum haemorrhage and massive post-operative internal haemorrhage, underwent bilateral internal iliac artery ligation. Referred cases with severe obstetric haemorrhage were sixty five (65%). Out of fifty eight patient, 16 (27%) were booked and 42 (73%) were unbooked and other demographic characteristics were shown in Table-I.

Morbid adherent placenta was the common indication (27%). Other indication were atonic post-partum haemorrhage (24%), uterine rupture (19%), post-operative internal haemorrhage (15%) and coagulopathy (13%). Out of 8 women with coagulopathy, 3 had HELLP syndrome, 3 had disseminated intravascular coagulation and 2 had idiopathic thrombocytopenic purpura (ITP). Out of 9 women with post-operative internal haemorrhage 7 were after obstetrical hysterectomy and 2 were after total abdominal hysterectomy (TAH) as shown in Table-II. These cases were referred to Allied Hospital in very critical condition, later on 6 expired in ICU (10%). But overall efficacy of bilateral internal iliac artery ligation in term of saving maternal life is 90% (52 cases).

Out of 58 patients, 41 patients had massive postpartum haemorrhage, with uterine salvage was 64% by BIAL. 15 (36%) women ended in hysterectomy because of failure to control bleeding. Additional procedures along with BIAL are uterine artery ligation, β lynch suture, abdominal packs and hysterectomy as mentioned in Table-III. Out of 58 patients, 52 (90%) were successfully managed by BIAL and discharged between (7-14) days. Mean blood loss, total blood transfusion and blood components, pre-

operative and post-operative haemoglobin are shown in Table-IV.

Out of 58 patients, 2 had complication of BIAL. One had re-laparotomy for persistent haemorrhage but she expired due to DIC. Other patient had ureteric injury but immediately managed by Urologist.

Overall efficacy of this procedure in term of conservation of uterus was 64%. Highest No. of patients had uterine salvage were due to atonic postpartum haemorrhage (72%) followed by rupture uterus (64%) and adherent placenta (56%) as shown in Table-V and VI.

Age in years	21-42	%age
History of C-section	43	74%
Booked	16	27%
Unbooked	42	73%
Referred cases	38	65%
Vaginal delivery	15	26%
Caesarean section	43	74%

Table-I. Demographic and clinical characteristics

Indications	No. of Patients	%age
Adherent placenta	16	27%
Atonic postpartum haemorrhage	14	24%
Uterine rupture	11	19%
Post-operative internal haemorrhage	9	17%
Coagulopathy	8	13%

Table-II. Indications of internal iliac artery ligation

Other procedure	No. of Patients	%age
Uterine artery ligation	27	70%
Uterine artery ligation and β -lynch	18	48%
Obstetric hysterectomy	15	36%
Abdominal packs	8	13%

Table-III. Other additional procedures along with BIAL

Parameter	Value Mean \pm SD.
Mean blood loss (ml)	2000(1500-3000)
Pre-op hemoglobin level g/dl	6.0 (4-7)
Post-op hemoglobin level g/dl	9.0 (7-10)
Total blood transfusion	5 (10-12)
Fresh frozen plasm	4 (5-10)
Platelets	3 (4-6)
Post operative hospital stay (days)	(7-10)
Admission to intensive care unit (days)	2-6

Table-IV. Other clinical characteristic

Indications	Hysterectomy	% age	Uterus conserved
Uterine atony	4	28%	72%
Rupture uterus	4	36%	64%
Adherent placenta	7	44%	56%

Table-V. Indications and success of conserving uterus

Uterus Conserved	Maternal Life Saved
64%	90%

Table-VI. Efficacy of procedure

DISCUSSION

Obstetric haemorrhage is one of the most common causes of maternal morbidity and mortality. Over the years confidential enquires highlighted a variety of substandard care issues and emphasized on importance of local procedures and policies for rapid and appropriate responses which should be rehearsed so once massive obstetric haemorrhage occurs management should follow sequence of therapeutic options by consultant obstetrician. The recent British committee for standards in haematology (BCSH) guidelines include a useful algorithm for management of major obstetric haemorrhage. Medical measures to control postpartum haemorrhage are uterotonic agents, prostaglandin analogues. When bleeding continues despite drugs, surgical intervention should be considered. The various surgical procedures are uterine artery ligation, B-lynch brace suture, bilateral internal artery ligation and hysterectomy. But choice of procedure depends upon parity, desire for child bearing, degree of shock and expertise of surgeon. Bilateral internal iliac artery ligation is safe and effective procedure and not only save maternal life but also conserve uterus. Many gynaecologist fear that cessation of blood supply may cause damage to pelvic organ but there are several reports of normal ovarian reserve and pregnancies after bilateral ligation of hypogastric arteries.^{12,23}

In our study fifty eight patients underwent BIAL. Total number of deliveries conducted in five years study period were sixty one thousand four hundred. Most of the patients who had postpartum haemorrhage was controlled by uterotonic drugs, uterine artery ligation and B-lynch suture only. Post-operative internal haemorrhage was

also best managed by laparotomy and securing haemostasis over stitch line and pedicles. But out of 1180 patients with obstetric haemorrhage (PPH + internal haemorrhage) (6%) required bilateral internal artery ligation, which is comparable with study carried out by Yavuz Simsek et al (8.2%).¹²

In our study, the efficacy of BIAL was found to be 90% in term saving maternal life. This was comparable to Patil et al (93%)¹³, Naithani et al 95%.¹⁴ Our study carried out in tertiary care center, and received 65% of referred case that may be the reason for slight low efficacy as compare to other studies. In this study, (36%) patients underwent hysterectomy to control intractable, massive postpartum haemorrhage, it was nearly same in a study Kabadi YM et al (33.3%).¹⁵ But uterus is conserved in (64%) women in our study. Then main indication for obstetrical hysterectomy was adherent placenta (44%), ruptured uterus (36%) and atonic uterus (28%). In (64%) patients uterus is saved. It was comparable with study by Joshi V et al¹⁶ which reported (60.7%), however some other studies showed higher percentage as reported by Yasmeen N et al¹⁷ (71.4%). In all cases in which we tried to conserve uterus, uterine artery ligation and B-lynch suture were done before attempting to ligate bilateral internal iliac artery. This was also supported by Abha Singh et al.¹⁸

Out of 58 women with severe obstetric haemorrhage, 9(17%) were with post-operative internal haemorrhage and 8(13%) had coagulopathy. Torn vessels retracted within the pedicles so no definitive bleeding point was detectable, in such cases BIAL was the only answer. Out of total 17, 9 patients were saved by bilateral internal iliac artery ligation. This was also supported by Mukhopadhyay P et al.¹⁹ One of our patient needed re-laparotomy after BIAL. She had recurrent internal haemorrhage. Later on she expired due to DIC and multiorgan failure. One patient had injury to ureter, similarly such complication was reported by Mehmat et al²⁰ one case of ureter ligation, while no such complication were noted in various other studies.^{13,20,21} BIAL as a procedure, with such a low complication rate and has very high rate of saving maternal

life (90%). Out of 58 women, 8 women (10%) died unrelated to the procedure. These women died due to delayed referral and developed irreversible shock and multi-organ failure. Early referral, prompt management of PPH, immediate availability of blood products and quick early decision of BIAL, not only save maternal life and also preserves fertility. All survived (50) patients discharged at (7-14 days) with few post-operative complications like fever, wound (5) infection and burst abdomen (2). Similar morbidity was also reported by Perveen et al and Mehmat et al.^{20,22} Due to some limitation, we have no long follow up system. Yildirim et al and Raba G et al have claimed that BIAL has no unfavorable effect on ovarian function.^{22,23}

CONCLUSION

In conclusion bilateral internal iliac artery ligation is effective and safe method to arrest and control massive obstetric haemorrhage (Such as postpartum haemorrhage and post-operative internal haemorrhage). Meticulous understanding of internal iliac artery and adjoining structures is mandatory to prevent intra-operative complications. Timely decision of BIAL not only save maternal life but also fertility. In my opinion all consultant obstetrician must be trained and should include in the algorithm to control massive obstetric haemorrhage.




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AUTHORSHIP AND CONTRIBUTION DECLARATION

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2	Tasnim Tahira	Proof reading.	
3	Naureen Javed	Review of literature	
4	Sumera Tahir	Final layout.	