IOSR Journal of Dental and Medical Sciences (IOSR-JDMS)
e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 15, Issue 11 Ver. VII (November. 2016), PP 21-23
www.iosrjournals.org

Internal Iliac Artery Ligation for Severe Obstetric and Pelvic Haemorrhage

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Abstract:
Aim: *To evaluate the effect of internal iliac artery ligation (IAL) performed for severe postpartum hemorrhage (PPH) and pelvic hemorrhage following gynecological surgery.*
Methods: *Forty-three women who underwent IAL over 15 years and 10 months (January 2000-October 2016), to control severe obstetric and pelvic hemorrhage were included in this retrospective analysis. IAL was performed as the primary surgical intervention or to control bleeding following obstetric hysterectomy, vaginal hysterectomy, and myomectomy of cervical fibroid.*
Results: *Out of fortythree women, 38 women underwent IAL due to uterine atony (n = 10), morbidly adherent placenta with previa (n = 16), uterine rupture (n = 5), colporrhexis (n = 3), broad ligament hematoma (n = 2) and secondary PPH (n = 2). Out of thirty eight women, 20 women underwent IAL as the primary surgical intervention. IAL resulted in control of bleeding in 18/20 women (90%), and only 2/20 women (10%) showed unsuccessful management of bleeding with IAL required obstetric hysterectomy. Seventeen women with persistent bleeding following obstetric hysterectomy were also treated with IAL. Four women underwent IAL after vaginal hysterectomy to control pelvic hemorrhage. One case underwent prophylactic IAL after myomectomy of huge cervical fibroid. The complications encountered during and after surgery were as follows: 1. superficial injury to the internal iliac vein, 2. failure to control hemorrhage in two case of PPH , 3.one patient died due to post-operative DIC.*
Conclusion: Bilateral internal iliac artery ligation is an effective procedure to control massive obstetric and gynecological hemorrhage. Increased understanding of retroperitoneal anatomy is needed to reduce risk of intra-operative and postoperative complications.
Keywords: *Hypogastric artery ligation, Internal iliac Artery ligation, Post partum hemorrhage, Pelvic hemorrhage*

I. Introduction

Pelvic hemorrhage, whether postpartum or related to gynecological surgery, is associated with a great degree of morbidity and mortality and has to be controlled immediately without compromising the rest of the pelvic blood supply. Internal iliac artery ligation can be traced back to 1812 when it was done unilaterally for a gluteal aneurysm. Baurngartner used bilateral artery ligation for treatment of hemorrhage secondary to carcinoma of the uterus while Howard Kelly[2] of Baltimore in 1894 was the first one to ligate both the internal iliac arteries along with ovarian arteries for bleeding cervical carcinoma with extensive broad ligament involvement. Internal Iliac Artery ligation is a life saving procedure in severe post partum hemorrhage when other measures fail. But waiting too long to perform the procedure is its biggest pitfall[3].

II. Methods

This is a retrospective study of the internal iliac artery ligation, done at our institute from January 2000 to October 2016. Both unilateral and bilateral ligations, performed as prophylactic and therapeutic measures, were considered. The approach used to reach the internal iliac arteries and the additional treatment required (e.g. obstetric hysterectomy) to control hemorrhage was noted. The intra-operative and post-operative complications, morbidity and mortality were recorded.

III. Results

Total of 43 women underwent internal iliac ligations (IAL), 41 bilateral and 2 unilateral. The indications are listed in [Table - 1]. All therapeutic and prophylactic ligations were done through a trans-peritoneal approach. Obstetric complications necessitated 38 internal iliac artery ligations. Five of forty-three ligations were done for gynecological indications. Four women underwent IAL after vaginal hysterectomy to

control pelvic hemorrhage. One case underwent prophylactic IAL after myomectomy of huge cervical fibroid measuring 17cm×16cm×14cm. Unilateral ligation was performed in 2 cases of broad ligament hematoma.

Out of 38 women with obstetric complications- severe postpartum hemorrhage, 20 underwent IAL as the primary surgical intervention. IAL resulted in control of bleeding in 18/20 women (90%), and only 2/20 women (10%) showed unsuccessful management of bleeding with IAL. In the two women for whom the bleeding was not controlled with IAL, obstetric hysterectomy was urgently performed before closure of the abdomen. After obtaining adequate hemostasis with IAL, no women required relaparotomy in the postoperative period. Seventeen women with persistent bleeding following obstetric hysterectomy were also treated with IAL to control bleeding from urinary bladder base and vaginal vault. Two of them required intra-abdominal packing and pack was removed after 48 hours. Out of seventeen, 11 cases had undergone obstetric hysterectomy for morbidly adherent placenta with central placenta previa and 4 cases for rupture uterus and 2 cases for secondary PPH. Out of seventeen, 9 cases had undergone obstetric hysterectomy at private hospital and referred to our institute for intra-abdominal hemorrhage.

The complications encountered during and after surgery were as follows: 1. superficial injury to the internal iliac vein, 2. failure to control hemorrhage in two case of PPH – one due to morbidly adherent placenta with central placenta previa, other due to severe atonic PPH, and 3. one patient died due to post-operative DIC.

IV. Discussion

Burchell1 has described the mechanism responsible for controlling pelvic hemorrhage following ligation of internal iliac artery without compromising blood supply. The ligation of internal iliac arteries greatly decreased the pulse pressure and converted the pelvic arterial system into a venous like system with slow and sluggish blood flow. There is a loss of 'trip hammer effect' of the arterial pulsation. With bilateral ligation, the drop in pulse pressure was 85% whereas with unilateral ligation it was 77% on the same side and 14% on the opposite side1. This reduction in pulse pressure permits thrombosis of bleeding vessel to occur.

Burchell1 also observed that free blood flow from a severed uterine artery even after bilateral IAL. After ligation of internal iliac arteries, collateral circulation in the parts supplied by the internal iliac artery would be by the anastomosis between the uterine and ovarian arteries; between the middle and the superior vesical arteries; between the iliolumbar with the last lumbar and between the lateral sacral with the middle sacral arteries1.

Waiting too long to perform it is its biggest pitfall[3]. Internal iliac artery have been ligated either transperitoneal or extra- peritoneal approach. In addition the extent of hemostasis achieved and collaterals formed remains same as for the selective anterior division ligation[4]. Therefore, main trunk ligation is recommended to decrease operative time.

In present study, failure to control post-partum hemorrhage with IAL occurred in 1 of the 10(10%) women in whom PPH due to uterine atony and 1 of the 5(20%) women in whom PPH due to morbidly adherent placenta with previa. Dalvi et al[5]and Chattopadhyay et al[6] reported 25% and 34% of such failure due to atonic PPH respectively. Stephen and Patrician[7] on the other hand have found the procedure effective in atonic PPH and have reported 50% failure rate in placenta accreta and uterine tears. A comparison of our hospital data with other studies is shown in [Table - 2] and [Table - 3].

In present study, we had superficial injury to the internal iliac vein in one case which is repaired by vascular surgeon and one patient died due to DIC. Delayed complications like ischaemic necrosis, parathesias of gluteal region or bladder atony were not occurred in our patients.

Due to good collateral circulation, reproductive function is not affected. These collaterals are able to undergo hypertrophy during subsequent pregnancy. This was clearly confirmed by demonstration of normal uterine and fetal circulation monitored with Color Doppler imaging in pregnancy after bilateral IAL[8]. Intrauterine growth retardation has not been reported after bilateral internal iliac and ovarian artery ligation suggesting adequate blood supply after ligation. O'leary[9] performed 110 cases of bilateral uterine artery ligation for treatment of post cesarean hemorrhage and has reported 12 pregnancies in his study. Mengert et al[10] reported 5 full term pregnancies in women who had IAL. Three of these cases had an additional ovarian artery ligation. Wagaarachchil and Fenando[11] reported 3 pregnancies out of 12 cases of IAL. In present study, 7 women conceived and delivered at term out of 18 cases in which IAL was used as a primary surgical intervention.

Today, pelvic arterial embolization is an alternative available life saving procedure to IAL and hysterectomy[12]. It can only be done in institutes where skilled arteriographic facilities are available.

V. Conclusion

Internal iliac ligation is a valuable surgical procedure and should be the first line of treatment where conservation of the uterus is desired. It is also rewarding to control hemorrhage after obstetric hysterectomy and hemorrhage after gynecological surgeries. The complications encountered are few if the procedure is performed

carefully and with knowledge of pelvic anatomy. The clinical skill once learnt, could be of immense benefit in controlling pelvic hemorrhage immediately.

References

[1]. Burchell RC− Physiology of internal iliac ligation. Journal Obstet Gynaecol Br Commonwealth 1968; 75: 642-51.
[2]. Kelly H− Ligation of both internal iliac arteries for haemorrhage in hysterectomy for carcinoma uterus. John Hopkins Med Journal 1894; 5: 53-4.
[3]. Reich WJ, Nechtow MJ− Ligation of internal iliac arteries. A life saving procedure for uncontrollable gynaecological and obstetric haemorrhage. J. Internat.Coll. Surgeons 1961; 36: 157-168.
[4]. Nandkishore G, Patikar VD, Niyogi GM, Jhankaria, Vaidya PR − Hypogastric artery ligation and its aftermath. J Obstet Gynecol India 1991; 41: 252-5.
[5]. Dalvi SA, Penkar SJ, Nagwekar S, Chaubal D− Ligation oi internal iliac artery procedure of choice in obstetric gynecological hemorrhage. J Obstet Gynecol India 1988; 38: 575-8.
[6]. Chattopadhyay SK− Surgical control of obstetric haemorrhage internal iliac artery ligation or hysterectomy. Int J Gynecol Obstet 1990; 32: 345-52.
[7]. Stephen E, Patrician MS− The efficacy of internal iliac artery ligation in obstetric haemorrhage. Surg Gynecol Obstet 1985; 160: 250-53.
[8]. Papp Z., Sztanyik L., Szabo I. et al − Successful pregnancy after bilateral internal iliac artery ligation monitored by color Doppler imaging. Ultrasound Obstet. Gynecol 1996; 7: 211–2.
[9]. O'Leary JA − Pregnancy after bilateral uterine artery ligation. J Obstet Gynecol 1980; 55: 112-3.
[10]. Mengert WJ, Burchell RC, Blumstein RW, Daskal JK− Ligation of internal iliac and ovarian arteries. J Obstet Gynaecol 1969; 34: 664-6 .
[11]. Wagaarachchil PT, Fernando L. Fertility following ligation of internal iliac arteries for life threatening obstetric hemorrhage. Oxford J Human Reproduction 2000; 15: 1311-3.
[12]. Pelage JP, Dref O, Mateo J,et al− Life threatening primary post partum hemorrhage: treatment with emergency arterial embolization. Radiology 1998; 208: 359-62.

Table 1: Indications for IAL

	No of patients	Percentages(%)
Obstetric		
Atonic PPH	10	23.2
Morbidly adherent placenta	16	37.2
Uterine rupture	5	11.6
Colporrhexis	3	7.0
Broadligament hematoma	2	4.7
Secondary PPH	2	4.7
Gynecological		
Secondary hemorrhage following Vaginal Hysterectomy	4	9.3
Myomectomy for huge Cervical fibroid	1	2.3

Table 2: Comparison of Indications for and complication rates of IAL

	Total	Obstetric Indication	Gynecological Indication	Complication Rate %
Chatopadhay SK	29	29	0	15.7
Dalvi et al	16	12	4	6.2
Saha	10	7	3	0
Nandanwar et al	15	8	7	13
Present study	43	38	5	9.3

Table 3: Failure to control haemorrhage in Atonic PPH

Author	No	%
Chatopadhay SK	10/29	34
Dalvi et al	1/4	25
Nandanwar et al	1/4	25
Present study	1/10	10