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Original Research Article

Bilateral Internal Iliac Artery Ligation and its Role in Reducing Maternal Mortality

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Abstract

Background: Post-partum hemorrhage (PPH) is a common complication, seen following 2-4% vaginal deliveries and 6% of caesarean sections. 35% of maternal mortality worldwide [(1)] and 38% of maternal mortality in India can be attributed to PPH. ***Material and Methods:*** Women who had B/L IIAL over a period of 1year 2021 at Dr. VVP Pravara Rural Hospital, Loni were reviewed retrospectively. Patients were identified using hospital records and operation theatre registers. Clinical history, routine blood investigations, patient demographic data including age, parity, mode of delivery and surgical outcome with complications of procedure were noted. ***Results:*** A total of 30 PPH deliveries were conducted during the year 2021. most common indication for B/L IIAL was PPH, seen in 26 out of 30 cases (86.6%) followed by 3 cases of placenta accreta spectrum (1%) and 1 (0.3%) with gynecological complication. Of the 30 cases requiring B/L internal iliac ligation, 9 (30%) were primigravida, 3 (10%) second gravida and 18 (60%) multiparas with 2 or more prior deliveries. Of the 5 cases further requiring obstetric hysterectomy, 2 were second gravidas and 2 multiparas. ***Conclusion:*** The ligation of the internal iliac artery as a procedure to stop pelvic hemorrhage is not practiced as commonly as it should be. However, it is safe and effective method to control massive pelvic hemorrhage in experienced hands.

Keywords: Iliac, bilateral, artery, ligation, maternal mortality.

INTRODUCTION

Post-partum hemorrhage (PPH) is a common complication, seen following 2-4% vaginal deliveries and 6% of caesarean sections. 35% of maternal mortality worldwide [1] and 38% of maternal mortality in India can be attributed to PPH [2]. It is defined as blood loss exceeding 500 ml in a vaginal delivery or 1000 ml in a caesarean section [3]. Abnormal postpartum bleedings unattended to in due time, cause 25% of maternal mortalities which rise to 60% in developing countries [4]. Amongst the various causes of life- threatening PPH, uterine atony is the commonest. When medical methods fail to restore the uterine tone, the traditional surgical method is emergency obstetric hysterectomy [5]. However, bilateral internal iliac artery ligation (IIAL) serves as an alternative approach to the surgical control of obstetric hemorrhage and conservation of fertility [5].

It was first performed by Howard Kelly in 1894, to control uterine cancer bleeding [6]. It is often indicated in placenta previa, accreta, abruptio placentae, uterine rupture, massive bleeding secondary to AV malformations or uterine leiomyomas [7]. To prove the effectiveness of the procedure, a retrospective study was done over a period of 1 year in a tertiary care hospital.

MATERIAL AND METHODS

Women who had B/L IIAL over a period of 1year 2021 at Dr. VVP Pravara Rural Hospital, Loni were reviewed retrospectively. Patients were identified using hospital records and operation theatre registers. Clinical history, routine blood investigations, patient demographic data including age, parity, mode of delivery and surgical outcome with complications of procedure were noted.

Surgical Technique: Standardized trans-peritoneal approach

Enter the retroperitoneal space between the round ligament and the infundibulo-pelvic ligament by

incising the posterior peritoneum. Identify the pulsatile external iliac artery (EIA) descending towards the mid-inguinal point. Trace the EIA superiorly till the bifurcation of the Common iliac artery (CIA) into Internal Iliac artery (IIA) and EIA. This is at the level of the sacral promontory. The IIA is identified as a pulsatile tubular structure arising medially at the bifurcation of CIA and dipping into the pelvis. Beware of the iliac veins which lie medial to the iliac arteries. The ureter can be identified as long tubular structure which crosses the bifurcation of the CIA and descends into the pelvis along with the IIA. After confirming ureteric vermiculation (peristalsis) it is retracted medially and preserved. Approximately 5cm from the origin of the IIA it bifurcates into the anterior and posterior branch. The anterior branch which supplies the pelvic viscera is to be ligated while preserving the posterior branch which supplies the gluteal muscles. About 2cm from its origin, the anterior branch of the IIA is ligated with a non-absorbable suture (preferably silk 0 sutures). Care must be taken while passing the tip of the right-angled clamp from medial to lateral below the artery to avoid damaging the iliac veins. Place a second free-tie suture distal to the initial ligature to avoid recanalization. Do not divide the vessel. Pelvic peritoneum is repaired with Vicryl 2-0 suture. All data was compiled in Microsoft excel and all data was analysed using Open Epi software version 2.3.1

RESULTS

A total of 30 PPH deliveries were conducted during the year 2021.

Table 1: Number of death due to PPH year wise

Number of death due to PPH	Number of deaths	Total	Percentage
Year 2020	3	48	6.25%
Number of deaths in the year 2021 among PPH patients undergoing bilateral internal iliac artery ligation (IIAL)	0	30	0%

Table 1 shows that there was no mortality noted among PPH patients undergoing bilateral internal iliac artery ligation (IIAL)

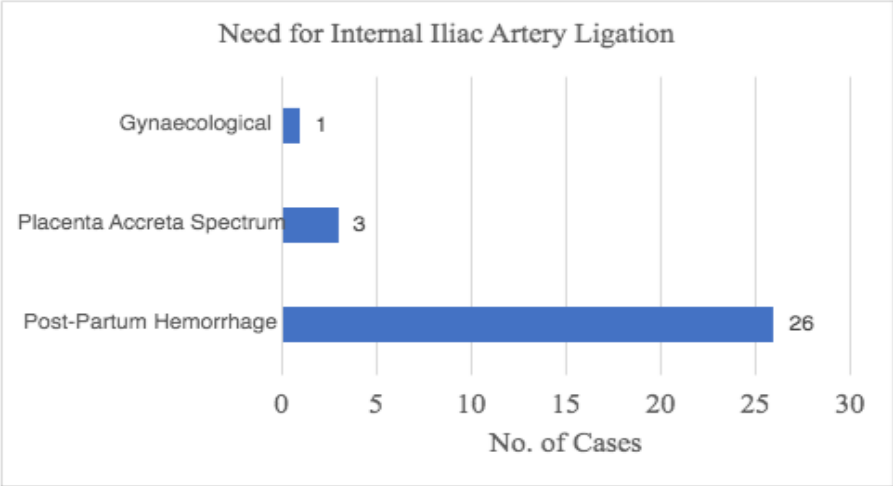

Figure 1: Clinical details and outcomes of 30 cases undergoing Bilateral IIAL

Figure 1 shows that the most common cause for ligation was post partum haemorrhage.

The most common indication for B/L IIAL was PPH, seen in 26 out of 30 cases (86.6%) followed by 3 cases of placenta accreta spectrum (1%) and 1 (0.3%) with gynecological complication. [represented by Figure 1] Of the 30 cases requiring B/L internal iliac ligation, 9 (30%) were primigravida, 3 (10%) second gravida and 18 (60%) multiparas with 2 or more prior deliveries. Of the 5 cases further requiring obstetric hysterectomy, 2 were second gravidas and 2 multiparas. The overall complication following B/L internal iliac ligation were seen in 5 cases (16.67%), the most common being need for obstetric hysterectomy in all 5 cases, with 1 case further complicated by DIC. Both the cases of uterine rupture required hysterectomy for control of bleeding, as did the single case of placenta accreta.

DISCUSSION

The internal iliac artery, also known as the hypogastric artery, is the vessel supplying a major portion of the pelvic viscera [5]. The ligation of this artery allows reduction of the pulse pressure in the pelvic arterial circulation by 77% if on the same side, however, by as much as 85% when done bilaterally [8, 9]. It leads to reduction in perfusion pressure in the arterial blood and hence aids coagulation [10]. Pelvic necrosis is avoided due to the extensive nature of collateral circulation developed through the branches of the aorta,

external iliac artery and the femoral artery [11]. In their recently conducted study including 58 patients, Unal *et al.*, reported effectiveness of the method as 87.9 percent [12]. Similarly, in their review of the results of retrospective studies encompassing 52 patients who had undergone internal artery ligation, Chelli *et al.*, indicated an 82.45 % success rate [13]. A review article suggests that a skill development program can be incorporated in the Post-Graduate Curriculum to teach the procedure on cadavers, where one grasps the anatomy, pelvic dissection which in turn can be used for exposure of internal iliac artery in caesarean sections, abdominal hysterectomy and eventually IIAL [14].

CONCLUSION

The ligation of the internal iliac artery as a procedure to stop pelvic hemorrhage is not practiced as commonly as it should be. However, it is safe and effective method to control massive pelvic hemorrhage in experienced hands. This is the method of choice to preserve and maintain the fertile state of the patient, especially in severe bleeding in young patients of low parity. Hence, there is an urgent need to train the newer generations of obstetricians and gynecologists adequately, so as to perform the procedure in emergency.

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