ROLE OF INTERNAL ILIAC ARTERY LIGATION IN CONTROL OF PELVIC HEMORRHAGE.

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Abstract

Hemorrhage in pregnancy is the leading cause of maternal mortality in developing countries. Internal iliac artery ligation is one of the life saving procedures in intractable pelvic hemorrhage. Although effective, the procedure is not commonly performed by obstetricians and gynecologists. Present paper aims at sharing author's experience about usefulness of this surgical procedure in arrest of pelvic hemorrhage and to remove the inhibition among practicing gynecologists regarding this procedure.Fifty four cases of pelvic hemorrhage were managed by internal iliac artery ligation over 15 year period at tertiary care center. Hemorrhage could be arrested in all cases.

Key Words: *Internal iliac artery ligation, Pelvic hemorrhage, Maternal mortality.*

Introduction

One of the important methods of controlling pelvic hemorrhage which has stood the test of time is the ligation of internal iliac arteries. The procedure was performed for the first time by Sir Horward Kelly in 1893 in control of hemorrhage during hysterectomy for uterine carcinoma[1]. The procedure was later introduced by Mangert W F et al[2] in 1969 and extensively investigated by Burchell RC[3] in 1968.

The main indications of the procedure in gynaecology include carcinoma of the cervix, inoperable cases of endometrial carcinoma with uncontrolled hemorrhage. In obstetrics, massive bleeding due to atonic or traumatic post partum hemorrhage, adherent placenta and rupture uterus are the main indicatons. The present study is aimed at sharing author's experience in regard to indications, usefulness and safety of internal iliac ligation in control of pelvic hemorrhage.

Materials and methods

Study comprised of analysis of 54 cases of internal iliac artery ligation performed by author over 15 years period at Pravara Rural Hospital Loni, which is the only tertiary care centre, treating majority of complicated and high risk obstetrical cases (Table1). Data analysis was done in relation to indications and complications related to the surgical procedure.

Sr. No	Indication	No. of cases
A	Obstetric	
1	Intractable atonic PPH	12
2	Rupture uterus	09
3	Abruption, Couvelaire uterus and PPH	03
B	Gynecological	
1	Radical hysterectomy (prophylactic)	26
2	Postoperative hemorrhage	04

Table 1: Distribution of cases according to indication

Surgery was performed by senior obstetrician, as majority of cases were in critical condition. General anesthesia was used in majority of emergency procedures. All cases received broad spectrum antibiotics and adequate blood replacement in postoperative period.

Surgical technique- The ligation of the internal iliac artery is technically simple, if the pelvic anatomy is

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properly understood. Peritoneum on the lateral side of common iliac artery is vertically opened in such a way that the ureter remains attached to medial fold of peritoneal reflection. Internal iliac artery is traced downwards (Figure1). The fascia over the artery is

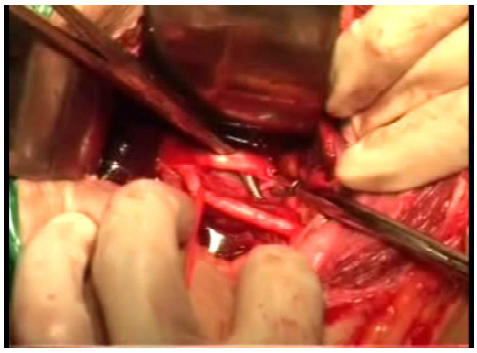

Figure 1: Showing internal iliac artery

dissected away. Double thread of non absorbable suture is passed beneath the artery with the help of mixter forceps. First suture is tied firmly but gently at a level below the origin of posterior branch of internal iliac artery. Second suture is tied below the first to avoid postoperative recanalisation.Once sufficient experience is gained,the time required for ligation is not more than 5 to 7 minutes after opening the abdomen. Transfixation or division of the artery in between the two sutures is neither required nor desirable.

An alternative technique for internal iliac artery ligation is to slip the ligature under the common iliac artery and then pull it under the external iliac from lateral to medial side and take it out between external and internal iliac artery and ligate the internal iliac artery alone. Its a dictum that the artery is not ligated until the bifurcation of the common iliac artery is both palpated and visualized as there is no room for error.

Results & Discussion

Internal iliac artery ligation is an emergency life saving procedure that every pelvic surgeon must be able to perform. It is relatively simple operation, when performed by surgeon having adequate knowledge of pelvic anatomy.

Anatomical considerations-Internal iliac or hypogastric artery arises at the bifurcation of the common iliac arteries on either side at the level of the lumbosacral intervertebral disc and in front of sacroiliac joints, from where it descends to the upper margin of the greater sciatic foramen for 3-4 cms where it divides into an anterior trunk which continues in line with the parent vessel towards the ischial spine and the posterior trunk which passes backwards towards the foramen.

Hemodynamic considerations-The main underlying principle in ligation of the internal iliac artery for control of pelvic hemorrhage is the conversion of an arterial pressure circulation into a venous pressure circulation. Unilateral ligation of the internal iliac artery, decreases the pulse pressure distal to point of ligation by 77%, while bilateral ligation decreases the pulse pressure by 85%.

As a result of the reduction in the pulse pressure, blood clots begin to form at the site of bleeding from damaged vessels. Blood supply to the pelvis continues via extensive collateral circulation with the aorta and the femoral artery including the lumbar, iliolumbar, middle sacral, lateral sacral, superior and middle hemorroidal and gluteal arteries. Collateral circulation becomes functional as early as 45-60 minutes after ligation. Author experienced little difficulty in palpating the pulsations of iliac vessels through the peritoneum in cases of hypovolemic shock. In such condition, the vessel can be traced downwards from its origin. There is comparative ease in locating right sided internal iliac artery than its counterpart.

Unfortunately, the procedure is not popularly performed by many qualified surgeons doing pelvic surgery. The probable reasons are, lack of confidence in doing the procedure and fear of complications. Some of the reported complications are accidental injury to iliac veins and ureters, necrosis of perineum, buttocks and severe blood loss. Pelvic or uterine bleeding was arrested in all cases who underwent internal iliac ligation. Postgraduate training programme must include orientation of trainees to this life saving procedure. Procedure can either be shown to them during elective gynecological surgery. Students can also be oriented to the technique on cadavers meant for teaching medical graduates.

Figure 2: Showing ischemic necrosis of buttock

bladder mucosa, atony of urinary bladder, paresthesia over gluteal area and circulatory disturbance of the inferior extremities[5].One case each developed/ sustained ischemic necrosis of buttock in postoperative period in the present study (Figure 2) and injury to iliac vessel.

Although effective in majority of cases, sometimes there is failure of arrest of hemorrhage following the procedure. Possible reasons are presence of large aberrant branches feeding blood to the area, dislodgement of clots when blood pressure rise, concomitant severe venous bleeding or massive necrosis after infection with destruction of the vessels. There may be technical difficulty in identification of vessel when the woman is in shock and has very low pulse pressure.

There was one maternal death after internal iliac ligation. This woman had irreversible shock with DIC due to

Conclusion

It is important for every pelvic surgeon to learn life saving procedure like internal iliac artery ligation. Pelvic surgeons must get out of fear for the technical considerations. Although, it may not always be effective in control of pelvic hemorrhage, it is more conservative procedure than obstetric hysterectomy in young women with intractable pelvic hemorrhage, involving lesser morbidity and giving chance of future fertility.

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