

Hypogastric Artery Ligation (A Life Saving Procedure)

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Summary

Analysis of 35 cases of hypogastric artery ligation over a period of 5 years was done at LTMG Hospital, Sion, Mumbai. In 24 cases the indication for internal iliac artery ligation was obstetric, PPH being the most common. In gynaecologic cases, prophylactic ligation prior to pelvic dissection during Wertheim's hysterectomy was commonest indication. In 30 cases intraperitoneal approach was used; in 5 cases it was done by extraperitoneal approach. There were three deaths in this series. Alternative modalities to control pelvic hemorrhage were discussed. This procedure was found to be quick and effective in controlling life threatening hemorrhage.

Introduction

Ligation of hypogastric artery for control of severe hemorrhage in obstetrics & gynaecology is one of the most important life saving procedures. Ever since Howard Kelly of Baltimore first performed bilateral internal iliac artery ligation for control of bleeding from cervical cancer, it has been used for variety of indications in obstetrics and gynaecology (Kelly M.A, 1894). Unfortunately, it is performed very seldom because of lack of adequate knowledge and training in this procedure. In majority of cases, it is done on an emergency basis, sometimes it is done electively during cancer surgery prior to pelvic dissection.

Material and Methods

To analyse efficacy of internal iliac artery ligation for control of hemorrhage in obstetrics and gynaecology,

a retrospective study of 35 cases over a period of 5 years at LTMG hospital was done. All cases under study were analyzed as regard to age, parity, indication, type and the outcome of the procedure. The mechanism and advantages of the procedure and possible alternatives were discussed. In all cases performed on emergency basis, it was done only when all other definitive measures to control bleeding either failed or were not feasible.

Procedure

Abdominal wall is opened by a midline vertical infraumbilical incision. The common iliac artery identified in front of sacroiliac joint by its pulsations. A longitudinal incision was made on the posterior parietal peritoneum lateral to the bifurcation of the common iliac artery. The ureter is identified in the medial flap of peritoneum. The anterior division of internal iliac artery

was traced. Ligation of the anterior division was done distal to the branching of the posterior division. The ligation was done as close to the branching of the uterine artery as possible. The vessel was ligated with two free ties of number 1 black silk 5mm apart. The posterior parietal peritoneum was closed with 1-0 chromic catgut continuous sutures. Abdominal wall was closed in layers.

Observation and Results

Age and parity of these patients is shown in table I & II. Amongst gynaecologic patients, there was one patient with age less than 30, case of choriocarcinoma. Twentyfour cases were obstetric patients while 11 were gynae. Of the 24 patients, 15 cases were transferred or referred patients.

Table I

Age of patients (yrs)	Obstetric cases	Gynaecologic cases
>20	1	-
21-30	19	1
31-40	4	3
>40	-	7
Total	24	11

Table II

Parity	Obstetric cases	Gynecologic cases
I	4	-
II	6	3
III	8	5
>IV	6	3

Indication of hypogastric artery ligation in these patients are shown in table III. Post partum hemorrhage and rupture uterus were the most common indications in obstetrics, while carcinoma cervix (Wertheim's hysterectomy) was the commonest gynaecologic indication. Postoperative hemorrhage was the commonest indication for hypogastric artery ligation in similar series published by Roy and Singh, 1996). All procedures done for obstetrical indication were done on emergency basis to control bleeding. In 9 cases it was done following obstetric hysterectomy. In gynaecology, in 8 cases it was done during radical surgery for

Table III

Obstetric cases (24)	No.	Gynecology cases (11)	No.
PPH	10	Ca Cervix (Wertheim's)	8
Rupture uterus	10	Ovarian tumor	1
Placenta praevia	2	Choriocarcinoma	1
Morbidly adherent placenta	1	Ca Endometrium	1
Broad ligament hematoma	1		

carcinoma cervix (Wertheim's hysterectomy) before doing deep pelvic dissection to decrease bleeding while in 2 cases, one each of ovarian tumor and choriocarcinoma, it was done as an emergency procedure to control massive intraoperative bleeding.

In 30 cases, it was done by intraperitoneal approach while in 5 cases (all Wertheim's hysterectomies) it was done by retroperitoneal approach. In 16 cases, bilateral main trunk of hypogastric artery was ligated, while in 9 cases anterior division was ligated on both sides. In 6 patients, one side main branch and one side anterior division was ligated. In 4 cases, unilateral hypogastric artery ligation was done. In one case of broad ligament hematoma during caesarean section and in three cases of lateral wall rupture, whose uterine vessel on one side was avulsed, unilateral hypogastric artery ligation on affected side was sufficient to control the bleeding.

In all but one patient, ligation was effective in controlling hemorrhage. In one patient, of severe PPH, obstetric hysterectomy was required even after hypogastric artery ligation to control bleeding.

In one patient there was injury to internal iliac vein (requiring suturing) during procedure. One patient developed gluteal necrosis, probably related to ischemia following bilateral artery ligation. Apart from this, there were two mortalities in obstetric group and one in gynaecology group (c/o ovarian tumor). All 3 patients were in moribund condition before the ligation was contemplated.

Discussion

Hemorrhage is one of the leading causes of maternal morbidity and mortality, PPH and rupture of uterus being the common causes. Obstetric hysterectomy is a common surgical treatment done in such situations but this sacrifices women's future fertility potential. Hypogastric artery ligation is especially useful for those cases of PPH who fail to respond to routine measures, but hysterectomy is relatively undesirable due to low age and parity. In gynaecology, internal iliac artery ligation is done during Wertheim's hysterectomy for

carcinoma cervix before contemplating deep pelvic dissection. Rarely it is done on emergency basis to control bleeding from cancer cervix or choriocarcinoma.

After ligation of the anterior division of the internal iliac artery, there is a drop in the blood pressure, a drop in the mean BP and the rate of blood flow through the collateral circulation. The pelvic circulation is converted into a venous system. Venous bleeding can be controlled by packing. Loss of arterial pulse allows a clot to form and remain in place. These changes are primarily unilateral. Unilateral ligation produces effect as great as bilateral ligation, collateral circulation of either side being better than that across midline. Unilateral artery ligation is particularly performed in cases of broad ligament hematoma or uterine rupture on lateral wall. In these cases, uterine artery on the affected side gets avulsed and bleeds. Because it gets retracted, it is difficult to trace and ligate it. In such cases, unilateral internal artery ligation on affected side is effective and the procedure of choice. Collateral circulation develops in 45 to 60 minutes after the ligation. By this time hemostasis has been achieved.

Burchell (1968) had demonstrated the development of collateral circulation after hypogastric artery ligation by taking serial arteriogram before and after the procedure (Burchell, 1968).

Percutaneous transvascular embolisation with microsphere, gelfoam or autologous blood clot can be an alternative to internal iliac artery ligation in majority of these cases. But this requires sophisticated costly equipment and are not available for mass population (Goldstein, 1975). Under such circumstances, hypogastric artery ligation appears to be a safe, quick and effective procedure. Thus it is important that all doctors concerned should be familiar with pelvic anatomy and dissection and should be properly trained in this life saving procedure.

Acknowledgement

We thank our Head of Department and the dean for allowing us to use and publish the hospital data.

References

1. Burchell R.C.: J. Obst. & Gyn. British C^owealth 75: 642; 1968.
2. Goldstein H.M.: Radiology: 115, 603, 1975.
3. Kelly H.A.: Ligation of internal iliac artery for hemorrhage in hysterectomy for carcinoma uterus John Hopkins Hospital 5, 53-56, 1894.
4. Roy Shanti, Singh Anita, J Obst Gyn India 46-3, 401; 1996.