LIGATION OF INTERNAL ILIAC ARTERY A PROCEDURE OF CHOICE IN OBSTETRIC AND GYNAECOLOGICAL HAEMORRHAGE

By

SUJATA A. DALVI, SUBHASH J. PENKAR,
SUHAS L. NAGWEKAR AND SUNIL D. CHAUBAL

SUMMARY

Internal iliac artery ligation in the control of severe spontaneous or operative haemorrhage is seldom used in the present day practice of obstetrics and gynaecology.

The present review gives study of 16 cases of hypogastric arterial ligation (unilateral or bilateral) done over a period of 5 years from 1982 to 1986 at Dr. R. N. Cooper Hospital. All these cases were done via transperitoneal approach.

Pregnancy is still possible in patients with ligation of internal iliac arteries and the procedure is safe, quick and easy to perform. Hence in cases of diar emergency, especially in young and low parity patients, this procedure is the saviour of the life of the patients in proper hands.

Introduction

Internal iliac artery ligation in the control of severe, spontaneous or operative haemorrhage (Pais *et al*, 1980) is seldom used in the present day practice of obstetrics and gynaecology. This is because most practitioners do not know about it, though the procedure is effective, non-dangerous and not difficult to perform. Hence, we feel it important to report our review to define the place of internal iliac ligation in the present day clinical practice.

Howard Kelly (Smith and Wyatt, 1977) of Baltimore in 1894 was the first one to ligate both internal iliac and ovarian arteries during abdominal hysterectomy for a bleeding cervical carcinoma with extensive broad ligament involvement. The early use of internal iliac artery ligation was confined to the patients with uterine carcinoma (Davo *et al.* 1959) but more recently it has been used in the control of spontaneous or operative haemorrhage in benign conditions.

Anatomy

The internal iliac or hypogastric arteries are the major blood supply to the pelvis and its organs. They arise from the common iliac and the ureter crosses anterior to the origin of external and internal iliac arteries, the corresponding iliac veins lie posterior.

From: Department of Obstetrics and Gynaecology, Dr. R. N. Cooper Hospital and Seth G. S. Medical College, Bombay-400 012.

Accepted for publication on 18-7-88.

Five routes of the collateral circulation are apparent.

1. The ovarian artery
2. The inferior mesenteric artery
3. The external iliac and femoral arteries
4. The middle sacral artery
5. The lumbar arteries.

These vessels are able to supply an adequate circulation to the pelvic structures even with both ovarian arteries additionally ligated. It is essential to know the anatomy of the internal iliac arteries as these retroperitoneal arteries are in direct relationship to the ureters and large iliac veins.

Physiology (Burchell, 1963)

Following internal iliac artery ligation, pulsation virtually ceased in artery distal to the ligature. Decrease in pulse pressure was the most important change. With bilateral ligation, the pressure drop was 85%, whereas with unilateral ligation, it was 77% on the same side and 14% on the opposite side.

The mean arterial pressure decreased to 24% with bilateral ligation and with unilateral ligation, the decrease in pressure was 22% on the same side and 10% on the opposite side.

The rate of the flow of blood dropped to about 48% on the same side after ligation.

Internal iliac artery ligation altered the pathways and reversed the direction of flow in the same arteries but did not prevent the flow to any pelvic arteries. Collateral arteries do not undergo compensatory growth even after several years.

Three principle collaterals are:
Lumbar iliolumbar,
Middle sacral—lateral sacral
Superior hemorrhoidal—middle hemorrhoidal

Usually only the first two pairs of collateral arteries function after ligation (because these vessels by themselves are competent). The third pair comes into play, only if the ligature inadverently includes the posterior division of iliac artery. If all branches of the internal iliac arteries are ligated, there is a reversed flow from a distal anastomosis in each branch.

Ligation of internal iliac artery decreases the pulse pressure and seemed to transform an artery into a venous like system. Though the mean pressure remained higher than the venous pressure but trip hammer effect of arterial pulsation was eliminated. Decreased pulse pressure which is the basic hemostatic effect of internal iliac ligation was done to the small diameter of anastomosis between the pairs of arteries involved in the collateral blood supply.

Material and Methods

The present review gives the study of 16 cases of hypogastric arterial ligation (unilateral or bilateral) done over a period of 5 years from 1982 to 1986 at Dr. R. N. Cooper Hospital.

Twelve of these patients were referred from peripheral hospitals.

Procedure: Only (Siegel *et al*, 1961) transperitoneal approach was used because:

1. This is a familiar gynaecologic technique.
2. Only one incision is necessary.
3. It is easy to ligate ovarian vessels.
4. Pelvic pathology can be visualised.

"Not to ligate the arteries until the bifurcation of the common iliac artery is both palpated and visualised." This identification which is an absolute must was followed before ligating the internal iliac

arteries. Even after this procedure, hysterectomy, if necessary was subsequently carried out.

Observation

Out of 16 cases of internal iliac ligation, in 14 cases bilateral and in 2 cases unilateral internal iliac ligation was done (Table I).

TABLE I

Internal iliac ligation	No. of cases
1. Bilateral	14
2. Unilateral	2

None of these cases were associated with ovarian vessel ligation.

Hysterectomy was subsequently carried out in 3 cases. In 1 case of PPH, the patient continued to bleed despite internal iliac ligation on both the sides and in 2 cases of rupture uterus, the uterus was not in a preservable state.

TABLE II

No.	Indications	No. of cases	%
1.	Rupture uterus	8	50
2.	Post-partum haemorrhage	4	25
3.	Intra-operative haemorrhage	2	12.5
4.	Post-operative haemorrhage	1	6.25
5.	Spontaneous pelvic haemorrhage (usually from far advanced carcinoma)	—	—
6.	For proficiency	1 (unilateral)	6.25

TABLE III

Complications	No. of patients	%
1. Death	1	6.25
2. Intra-operative injury to other vessels	—	
3. Technical failure	—	
4. Resulting slough	—	

The complications encountered, during and after surgery are listed in Table III. There was one case of post-operative mortality after 8 hours because of DIC following severe haemorrhage.

Discussion

Internal iliac artery ligation is safe, quick and easy to perform. Hysterectomy is not necessarily always indicated in uncontrollable obstetric and gynaecological haemorrhage especially originating from cervix and lower uterine segment. Pregnancy is still possible in patients with ligation of internal iliac arteries with or without ovarian artery ligation.

Hence, in cases of dire emergency, this procedure is safe in proper hands and is saviour of the life of the patient especially in young and in low parity patients where preservation of child bearing is needed. It has been pointed out that a majority of residents in their training tenure today have not seen this operation, are not aware of the surgical anatomy of the internal iliac arteries and hence not trained to perform the operation and do not realise its potential. Hence. this operation deserves

emphasis in our resident training programme and more wide spread use in clinical practice.

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A Cervical Pregnancy—Mehta et al. p. 616

Fig. 1
Shows the cervix which is ballooned up with 14 weeks gestation. Above the cervix can be seen the body of the uterus with an empty endometrial cavity.

Isolated MIF Deficiency—Mukherjee et al pp. 625-626

Fig. 1
Showing the body contour, build and hair distribution of the upper half of the body.

Fig. 2
Showing the penis and empty scrotum. The Laparotomy scar can be seen.

Fig. 3
The removed specimen.

Osteogenesis Imperfecta—Nirmala Kumari & Mishra pp. 622-623

Fig. 1
Marked projection and depression in both lower limbs.

Fig. 2
X'rays showing multiple fractures of the long bones in upper and lower extremities and also fracture of ribs on left side.

Multiple Migratory Intrauterine Devices—Datta pp. 627-628

Fig. 1
X-rays showing the presence of I.U.C.Ds. in the peritoneal cavity.

Fig. 2
X-rays showing the presence of I.U.C.Ds. in the peritoneal cavity.

Pregnancy after Malignant Ovarian Tumour —Kaur p. 619

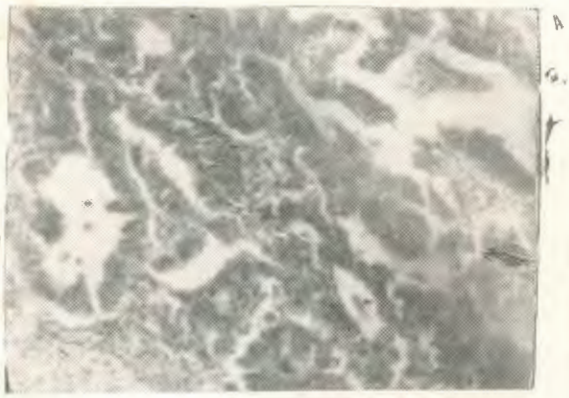

Fig. 1
Microphotograph of right ovarian papillary cystadeno carcinoma.

A Rare Case of Double Uterus with Associated Uro-Genital Anomalies—Kaur p. 623

Fig. 1
Photograph showing the presence of double uterus.

Desmoid Tumour Following Pregnancy—Rangnekar & Bharadwaj p. 627

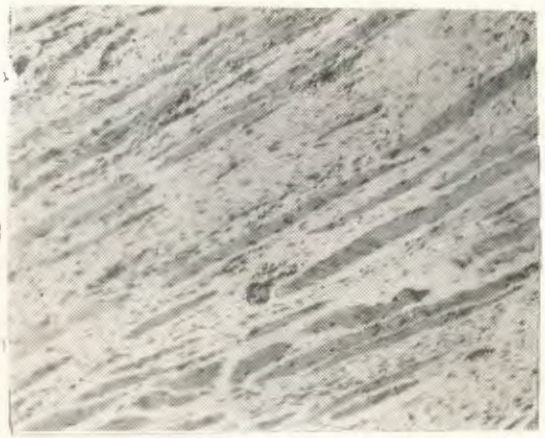

Fig. 1
Microphotograph showing diffuse infiltration of skeletal muscle by bands of well-formed slender fibroblasts.

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