HYPOGASTRIC ARTERY LIGATION AND ITS AFTERMATH

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SUMMARY

This is a collaborative research study from the Departments of Obstetrics & Gynaecology and Radiology. An analysis has been made of the hypogastric artery ligations done in our institution, from January 1985 to March 1990. A prospective pilot study begining June 1989 has been added to the existing data. Main trunk ligation versus selected anterior division ligation has been prospectively studied both on table and with pelvic angiography. Pelvic angiography using the standard Seldinger technique has been done 14 days post hypogastric artery ligation in emergency obstetric cases. In selected gynaecological cases posted for Wertheim's hysterectomy, pelvic angiography has been done both pre and post-hypogastric artery ligation. The "Fallouts" of hypogastric artery ligation (HAL) and study of pelvic vasculature and collaterals is outlined compactly in our review.

Introduction

"After ligature, circulation in the parts supplied by the internal iliac artery would be carried on by the anastomosis of the uterine and ovarian arteries; of the opposite vesical arteries; of the iliolumbar with the last lumbar;...of the lateral sacral with middle sacral...". Gray, (1870). Burchell (1964) had shown radiographically what the anatomists had learned manually 75 years ahead of him. We are trying to update on the good legacy of Burchell's (1964) work regarding hypogastric artery ligation.

Hypogastric artery ligation (HAL) and internal iliac artery ligation are the same procedure. HAL in the control of severe spontaneous or operative haemorrhage is little known and seldom used in the present day practice of obstetrics and gynaecology. This is not because the procedure is ineffective, dangerous or even difficult to do but because the majority of residents currently in training will finish without seeing the operation. No one will emphasize to them its' life saving potential. How many women will die of

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Accepted for Publication 20/9/90

haemorhage as a result of this oversight in the training of doctors is uncertain but that these deaths are preventable is not.

Surgical Anatomy and Principles

The hypogastric arteries are the major blood supply to the pelvis and pelvic organs. They originate with the external iliacs from the common iliacs. The ureter crosses anterior to the origin of the external and internal iliac arteries; the corresponding iliac veins lie posterior.

The mechanism by which HAL controls bleeding was thought to be one of stopping blood flow distal to the ligature.Burchell (1964) delineated the true mechanism by which HAL controlled haemorrhage. There is a near elimination of the pulse pressure distal to the ligation which decreased 77% from baseline on the side of the ligation and 85% if both hypogastric arteries were ligated but only 14% on the side opposite a unilateral ligation. The effect of HAL is to change a pulsating arterial system to one resembling venous flow. Ideally, the hypogastric arteries should be ligated distal to the posterior division; the posterior division, however, is not always readily apparent. In such a situation, one approximated the location by ligation of the hypogastric artery 2.5-3.0 cm. distal to the bifurcation of the external and internal iliac arteries. Fig.1 and Fig.2

Fig.1 Preoperative Pelvic Angiogram.

Fig.2 Post Operative Pelvic Angiogram

Material and Methods

The present review gives the study of 26 cases of HAL (unilateral or bilateral) done over a period of 6 years from 1985 to 1990 13 of these patients were referred from peripheral hospitals. In the same period, HAL was performed in 13 gynaec patients. As Fig. 1 demonstrated, we have made increasing use of HAL over the years with more than half of the patients having been operated upon in the last 3 years. Table II shows the arteries ligated in the 26 patients. 24 of the patients had bilateral HAL and 2 had unilateral HAL. In 5 patients, both HAL and ovarian arteries were ligated.

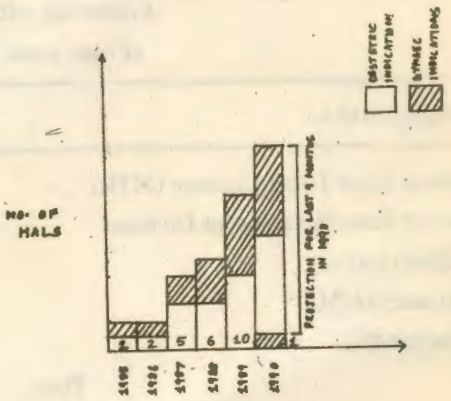

Fig.3 No.of HALS

TABLE I

Arterial Ligations (26 Patients) 1985-1990

Hypogastric Artery		Ovarian Artery	
Bilateral	Unilateral	Bilateral	Unilateral
24	2	5	-

From Table II it is clear that the patients can be classified into 5 groups on the basis of the indication for which HAL was done. Group I includes one patient with spontaneous pelvic haemorrhage of severe degree from an endometrial cancer involving the vagina. Group II includes 12 patients in whom HAL was done to control post-operative haemorrhage. The haemorrhage followed vaginal operations in 3 and abdominal operations in 9. Group III includes 3 patients on whom HAL was done to control haemorrhage occuring during the course of the operation. Group IV includes those patients in whom HAL was done prophylactically at the time of Wertheim's operation or Abdominoperineal resection. Group V consists of 2 patients who had HAP electively, at the time of abdominal hysterectomy; for a teaching indication. Beginning June 1989, the efficacy of main trunk ligation versus selective anterior division ligation has been prospectively studied (Table III) both on table and with pelvic angiography. Pelvic angiography has been done by the standard Seldinger's method under local anesthesia using 21 gauge arterial puncture needle, a fine guide wire and 4-5 F catheters.

TABLE II

Hypogastric Artery Ligations : Indications (1985-1990)

	No. of Patients
Haemorrhage	
Spontaneous	1
Postoperative	12
Operative	3
Prophylactic	8
Teaching	2
Total :	26

TABLE III

Follow up with Pelvic Angiography

(From June 1989 to March 1990)

Procedure (HAL)	No. of Patients	Collaterals
Bilateral Main Trunk Ligation (MTL)	4	Well formed
Bilateral Selective Anterior Division Ligation (SADL)	1	Well formed
Right side SADL Left side MTL	1	Well formed
Total :	6	

Discussion

Reich and Nechtow (1961) emphasised that the biggest pitfall with HAL was waiting too long to perform it. Laceration suturing, volume replacement and blood product transfusion are initial steps depending upon the situation. If the patients' condition deteriorates despite the above steps, action is necessary before the deterioration becomes irreversible. The traditional surgical approach towards HAL have been either transperitoneal or extraperitoneal. According to Ball Thomas (1963) ligation of the hypogastric vessels from the gluteal aspect might be a last resort measure when every means of controlling haemorrhage from the pelvic approach has been unsuccessful. If HAP is selected to control obstetric haemorrhage, the patient should be relatively stable hemodynamically.

Hysterectomy is usually the better choice in the unstable patient. The operation markedly lowers the pulse pressure, moderately lowers the bloodflow, but only modestly lowers the mean arterial pressure. Before the ligature is placed, the common, external and internal iliac arteries and the ureter should be positively identified. Whether we do a main trunk ligation or a selective anterior division ligation hemostasis achieved is the same as also the collaterals formed. Hence, rather than spending time on dissecting out the anterior division after identifying the posterior division, we advocate main trunk ligation. According to Smith and Wyatt (1977) whenever possible, a prior attempt to control pelvic hemorrhage by anteriographic embolization should be made, because this does not compromise the possibility of successful subsequent surgery.

Bibliography

1. *Ball Thomas : Gynec. Sur. and Uro. 2nd edition. Pg. 527, The C.V. Mosby Co., 1963*
2. *Burchell R.C. : Obstet. Gynec. 24:737,1964*
3. *Henry Gray : Text book of Anatomy, 1870*
4. *Reich W.J., Nechtow J.R. : J. of Int. College of Surg. 36:157,1961*
5. *Smith D.C., Wyatt J.F. : Obstet & Gynec. 49:317,1977*