

Editorial

Internal Iliac Artery



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The success of any surgical procedure involves control of pain, control of infection and control of bleeding. Timely recognition and correction of abnormal hemostatic mechanisms and control of preoperative, intraoperative and post operative haemorrhage are an essential part of any surgical procedure. Adequate hemostatic mechanisms, good technical skills of surgical team and provision to compensate for deficiencies are essential for a satisfactory postoperative outcome. One of the important methods of controlling pelvic haemorrhage which has stood the test of time is the ligation of the internal iliac arteries. This procedure was performed for the first time by Sir Howard Kelly in 1893 to control haemorrhage during hysterectomy for uterine carcinoma. The procedure was later introduced by Mengert WF et al, 1969 and extensively investigated by Burchell RC 1968.

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

The main underlying principle in ligating the

internal iliac artery 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 the 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 following ligation of the hypogastric arteries. The blood supply in the pelvis continues via the extensive collateral circulation with the aorta and the femoral artery including the lumbar, iliolumbar, middle sacral, lateral sacral, superior and middle hemorrhoidal and gluteal arteries. This collateral circulation becomes functional as early as 45-60 minutes after the ligation. The significance of this collateral circulation lies in the fact that successful pregnancies have occurred after bilateral hypogastric artery ligation. However a thorough understanding of the pelvic Vasculature and also of the possible individual variations in the branching pattern of the internal iliac artery is necessary for pelvic surgeons. It is also important for one to note that the anterior division of the artery should be preferably ligated distal to the posterior parietal branch so that the flow can still occur distal to the point of ligation, only as redistribution of flow in the middle hemorrhoidal arteries while the flow in the iliolumbar and middle sacral arteries above the point of ligation will continue to be normal.

The ligation of the hypogastric artery is technically quite simple if the pelvic anatomy is understood properly. The peritoneum on the lateral side of the bifurcation of the common iliac artery is opened by a longitudinal incision in such a way that the ureter remains attached to the medial peritoneal reflection. The artery is traced and carefully dissected away from the underlying vein. The fascia over the artery following which a double thread of non absorbable suture material is passed underneath the artery and tied. After tying one suture out of the two is picked up and incised. A second suture distal to the first one is tied to avoid postoperative recanalisation. Transfixation or division of the artery in between the two sutures is neither required nor desirable. An alternative technique for hypogastric 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.

Normally whenever possible the branch which is close to the source of the pelvic bleeding is ligated, however in the event of massive bleeding and hypovolemic shock and especially when the pelvic anatomy is distorted, ligation of the branches like the uterine arteries is technically much more difficult than ligating the anterior division of the internal iliac and the latter should be preferred.

The main indications of the procedure in gynaecology includes carcinoma of the cervix, inoperable cases of endometrial carcinoma with uncontrolled hemorrhage, sarcoma of the uterus, to avoid vascular spread, as part of Wertheim's radical hysterectomy or pelvic exenteration. In Obstetrics, massive bleeding due to atonic or traumatic postpartum hemorrhage, placenta accreta, increta or percreta and rupture uterus are the main indications. Rare indications include a gluteal artery aneurysm, internal pudendal artery aneurysm or carcinoma rectum, or vagina.

It is important to avoid the external iliac artery which is the only source of supply to the inferior extremities. Palpation of femoral artery for pulsation is must prior to ligating internal iliac artery to make sure error does not occur. Subsequent fertility is rarely hampered inspite of the fact that the blood supply is reduced by almost 50% due to the development of an

extensive collateral supply with time.

The methods of controlling a massive haemorrhage have been aptly described in a single sentence as follows: to clamp, to cut, to cauterize, to ligate, pack, pressure and pray as sometimes only the last option seems feasible after every possible effort has been made. Hence it is important for every pelvic surgeon to learn life saving procedures like hypogastric artery ligation as a part of postgraduate training to be taught even during routine Total Abdominal Hysterectomy and get rid of the fright due to technical considerations. Although it may not be uniformly successful, it is a more conservative procedure than hysterectomy involving lesser morbidity and preserving future fertility when correctly performed.

References

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