



RESEARCH ARTICLE

INTERNAL ILIAC ARTERY LIGATION – A LIFE SAVING PROCEDURE IN OBSTETRICS AND GYNAECOLOGY PRACTICE

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ABSTRACT

Internal iliac artery ligation (IIAL) is a surgical procedure performed to reduce pelvic blood flow. It is most commonly employed in situations where there is life-threatening pelvic hemorrhage, particularly obstetric and gynecologic emergencies, such as postpartum hemorrhage (PPH), trauma, or pelvic surgeries. By ligating the internal iliac artery, the arterial blood flow to the pelvis is reduced, thereby diminishing the pressure in the smaller arteries and capillaries supplying the pelvic organs. This helps to slow or stop hemorrhage while preserving blood flow via collateral circulation, especially from the external iliac artery and other surrounding vessels. The uterus and pelvic organs still receive blood from other arterial sources, reducing the risk of tissue ischemia. The procedure is often performed via laparotomy but can be done laparoscopically.

IN trauma surgery, vessel loops or tapes along with vascular clamps or Rummel tourniquets have been used for temporary reduction of internal iliac blood flow and then released subsequent to control of distal hemorrhage

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INTRODUCTION

This method of internal iliac artery ligation is challenging even for an experienced pelvic surgeon, especially when in the setting of a large uterus, limited exposure through a transverse lower abdominal incision, ongoing pelvic hemorrhage, or obesity. Successful and safe bilateral internal iliac artery ligation becomes even more difficult when attempted by a surgeon who rarely operates deep in the pelvic retroperitoneal space [1]. For these reasons, uterine compression sutures, uterine artery ligation, and arterial embolization have largely replaced this procedure.

Bilateral ligation of the internal iliac arteries reduces the pulse pressure of blood flowing to the uterus [2]. The utility of the procedure may be compromised when there are extensive collateral vessels (such as in placenta percreta). Reverse filling of the internal iliac arteries has been reported beyond the point of ligation via branches of the external iliac artery (inferior epigastric, obturator, deep circumflex iliac, and superior gluteal arteries) [3,4]

Anatomy of the Internal Iliac Artery:

The internal iliac artery, also known as the hypogastric artery,

arises from the common iliac artery at the level of the sacroiliac joint and supplies blood to the pelvic organs, including the uterus, bladder, rectum, and reproductive organs. It has anterior and posterior divisions, with the anterior division supplying most of the pelvic viscera.

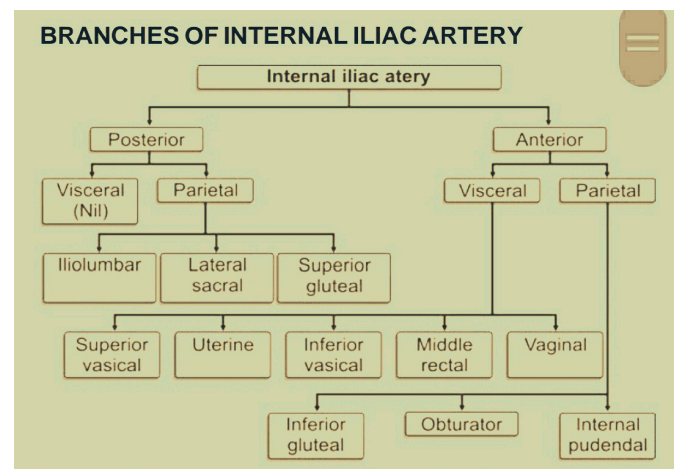


Figure 1 Branches of internal iliac artery

Indications for Internal Iliac Artery Ligation

- 1. Obstetric hemorrhage: This is the most frequent indication, particularly in cases of severe postpartum hemorrhage unresponsive to medical management

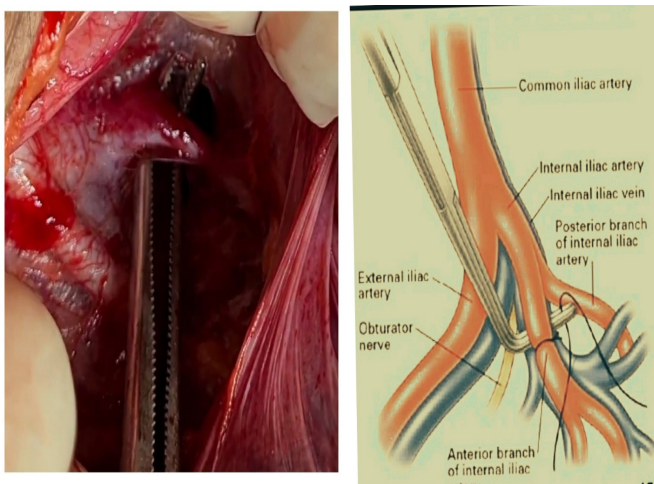
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2. Pelvic trauma: In situations of pelvic fractures or trauma where bleeding cannot be controlled by less invasive means.
3. Gynecological surgeries: In cases of large fibroids, pelvic tumors, or endometriosis where heavy bleeding occurs.
4. Pelvic malignancy: To reduce blood flow in certain cancers during surgery or palliative care.
5. Pelvic infection or abscesses: When reducing blood supply to a severely infected region becomes necessary.

The technique for IAL is performed bilaterally as follows:

- Open the anterior leaf of the broad ligament (with a Metzenbaum scissors or electrosurgery) and lyse the areolar tissue of the retroperitoneum.
- The external iliac artery is readily identified at the medial margin of the psoas muscle, and is followed to the common iliac artery bifurcation. The internal iliac artery is approximately 4 cm in length before it divides into anterior and posterior branches.
- Ideally, the dissection should be carried caudally to the anterior and posterior trunks of the internal iliac artery so that the anterior trunk can be selectively ligated. In practice, this is so difficult that the entire internal iliac artery usually is ligated at its origin.
- Dissect away the nodal tissue overlying the internal iliac artery by spreading the tissue with a right angle or tonsil clamp or the tips of Metzenbaum scissors. Continue the dissection anterior and lateral to the internal iliac artery. Proceed in the same plane around the circumference of the artery to separate it from the internal iliac vein, which is slightly medial and posterior to the artery. Pass a number 1 silk or nonabsorbable synthetic suture (eg, polypropylene) around the artery from lateral to medial and tie securely. An alternative technique is to use surgical clips to ligate the internal iliac artery, which eliminates the need for circumferential dissection and thus may reduce the risk of iliac vein injury [5].



**Figure 2** How to identify and ligate internal iliac artery

The surgeon isolates and ligates the internal iliac artery bilaterally or unilaterally depending on the severity of the hemorrhage. Care must be taken to avoid damage to nearby nerves and structures.

**Complications:**

While effective, IIAL can have complications, including: Ischemia of pelvic organs (though rare due to collateral circulation).

Nerve injury.

Deep vein thrombosis (DVT) or thromboembolism due to reduced blood flow.

Internal iliac artery ligation remains a valuable technique, particularly in obstetric and trauma care, for controlling hemorrhage when other interventions are insufficient.

**Case 1**

A 31-year-old women underwent LSCS for presumed cephalopelvic disproportion at full cervical dilatation. A female live infant was delivered. Subsequently it was found that the lateral aspect of the uterine incision had extended postero-inferiorly on the left side. Despite repairing this tear with continuous chromic catgut, it was found that there was no cessation of bleeding from this site. The haemorrhage did not respond to local pressure or bimanual compression. Similarly ligation of the left uterine vessels was unsuccessful. Left IIAL, in the manner described above, stemmed the haemorrhage and the operation and convalescence were subsequently uncomplicated.

**Case 2**

A 27-year-old woman was planned for suction evacuation for termination of pregnancy at 11 week 4 day period of gestation. During the procedure perforation and bleeding ensued. After advance this procedure into laparotomy a very large haematoma was seen in the right broad ligament. The perforation was identified and sutured. However, the broad ligament haematoma continued to expand and ruptured into the peritoneal cavity. Exploration of the right broad ligament was soon abandoned as the distorted pelvic anatomy made ureteric injury likely. A right IIAL was performed in the manner described above. The bleeding controlled and the procedure thereafter was uncomplicated.

**Case 3**

A 52-year-old woman who had electively planned for a simple abdominal hysterectomy. After few hours patient started to complain of abdominal pain severly. on examination there was suspicious of hemoperitonem. immediately patient shift back to operating theater for laparotomy, following evacuation of 2 l of blood drain out, the left pelvic peritoneum was found to be congested with an oozing haematoma. It was presumed that the left uterine artery ligature had slipped, but despite careful exploration this could not be identified. Left iliac artery ligation stemmed the bleeding and following a 3-unit blood transfusion the patient made an uncomplicated postoperative recovery.

**DISCUSSION**

Bilateral internal iliac artery ligation is an effective life-saving method to control obstetrical and gynecological hemorrhage and a hysterectomy can often be avoided. Ligation of internal iliac artery was first performed by Kelly<sup>2</sup> with a success rate 95% and without any major complication. [6]

IIAL was first performed in 1821 for a gluteal aneurysm. Its first

gynaecological application was for intractable haemorrhage secondary to carcinoma of the cervix.[7]

Wagaarachchi and Fernando<sup>6</sup> observed future pregnancy in 50% of the cases following bilateral ligation of internal iliac artery. Bilateral ligation of internal iliac artery is a safe, rapid and effective way of controlling obstetric and gynecological hemorrhage.[8]

## CONCLUSION

Internal iliac artery ligation is a life-saving surgical technique primarily used to control severe pelvic hemorrhage, particularly in obstetric emergencies and trauma. When performed correctly, internal iliac artery ligation is a highly effective intervention that can prevent the need for more radical procedures such as hysterectomy in obstetric cases. This is necessary for all the O&G specialists to acquire skill in the technique of internal iliac ligation during their postgraduate course or during senior residency period. If this becomes compulsory in the post graduate study, than it will be very helpful in lifesaving. The modified extraperitoneal technique of internal iliac ligation is advantageous and useful in selected cases.

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