

**Research Article**

## **VARIATIONS IN THE BRANCHING PATTERN OF THE INTERNAL ILIAC ARTERY**

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### **ABSTRACT**

This study was conducted at Dr. Pinnamaneni Siddhartha Medical College, Gannavaram and Gitam Medical College, where the dissection for under graduates is under taken, and dissected specimens of pelvic region is used to study. The Internal iliac artery was studied by dissection of 50 adult pelvic halves. The obturator artery was more variable and arose from the inferior epigastric artery in 26%, from the external iliac artery in 8%, from the common trunk of inferior gluteal-internal pudendal in 14%, from superior gluteal, inferior gluteal, and internal pudenda arteries in 4% of cases and from iliolumbar artery in 2%. The findings noted in the present study regarding the branching pattern of internal iliac artery had contributed to a better understanding and will prove definitely useful to clinicians in their respective fields.

**Keywords:** *South Indian Population; Pelvic Region; Internal Iliac Artery; Branching Pattern*

### **INTRODUCTION**

Each internal iliac artery (IIA) is about 4 cm long and begins at the common iliac bifurcation level with the intervertebral disc between L5 and S1 vertebrae and anterior to the sacroiliac joint. As it passes downward across the brim of the pelvis it is separated from the psoas major by the external iliac vein and has the internal iliac vein lying somewhat to its posterolateral side. The ureter usually lies immediately on the pelvic surface of the internal iliac artery or at most only slightly anterior or posterior to this artery. The artery typically ends by dividing into two major trunks, an anterior and a posterior. IIA has multiple variations in the branching pattern. Adachi B 1928 classified the patterns into five different types, based on its large parietal branches, namely, SG, IG and IP. Only these branches showed sufficient regularity in their origins to enable grouping into different patterns. He described the following types: type I: the superior gluteal artery arises separately from the IIA, and the inferior gluteal and internal pudendal vessels are given off by a common trunk. If the latter divides within the pelvis it is considered to be type Ia, whereas if the bifurcation occurs below the pelvic floor it is classified as type Ib (62 sides; 51.2%); type II: the superior and inferior gluteal arteries arise by a common trunk and the internal pudendal vessel separately. If the trunk common to the two gluteal arteries divides within the pelvis it is type IIa and if the division occurs outside the pelvis it is classified as type IIb (28 sides; 23.1%); type III: the 3 branches arise separately from IIA (22 sides; 18.2%); type IV: the three arteries arise by a common trunk. The subtyping in this group is based on the sites of origin of the superior gluteal and the internal pudendal arteries from the parent stem. In type IVa the trunk first gives rise to the SG before bifurcating into the other two branches; in type IVb the internal pudendal is the first vessel to spring from the common trunk, which then divides into superior and inferior gluteal arteries (5 sides; 4.1%); type V: the internal pudendal and the superior gluteal arteries arise from a common trunk, and the inferior gluteal has a separate origin (1 side; 0.8%) (Adachi, 1928).

### **MATERIALS AND METHODS**

A total of 50 pelvic halves had been studied, of these, 6 were from female and 44 were from adult males. The material consisted of adult subjects between the ages of forty and eighty five, from the dissection hall of department of anatomy of Dr. Pinnamaneni Siddhartha Medical College, Gannavaram and Gitam Medical College, Andhra Pradesh. The parietal branches were traced till their exit from the pelvic cavity. The visceral branches were traced till they reached the organ of their destination.

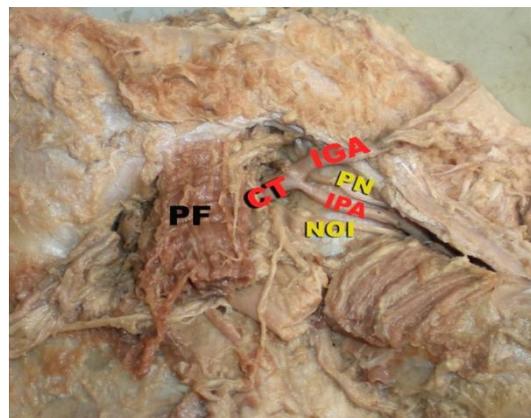
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**RESULTS AND DISCUSSION**

**Observations**



**Figure 1:**



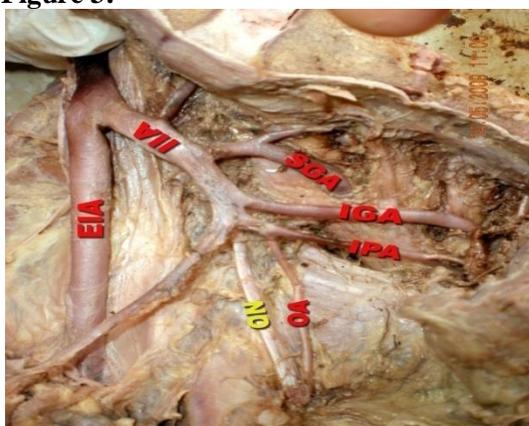
**Figure 2:**



**Figure 3:**



**Figure 4:**



**Figure 5:**



**Figure 6:**

**IIA: INTERNAL ILIAC ARTERY**  
**SGA: SUPERIOR GLUTEAL ARTERY**  
**IPA: INTERNAL PUDENDAL ARTERY**  
**ON: OBTURATOR NERVE**  
**CT: COMMON TRUNC**  
**NOI: NERVE TO OBTURATOR INTERNUS**

**EIA: EXTERNAL ILIAC ARTERY**  
**IGA: INFERIOR GLUTEAL ARTERY**  
**OA: OBTURATOR ARTERY**  
**PF: PIRIFORMIS**  
**ILA: ILIOLUMBAR ARTERY**  
**PN: PUDENDAL NERVE**

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In one specimen, the obturator artery was given off from superior gluteal artery (figure:1). In 4 specimens the inferior gluteal artery and internal pudendal artery were arising from a common stem which has been given off in the gluteal region (figure 2). In 26% of specimens, the obturator artery was arising from inferior epigastric artery which is a branch of external iliac artery (figure 3). In 8% of specimens, obturator artery was found to arise as a direct branch from external iliac artery (figure 4). In 14% of specimens internal pudendal artery and obturator artery arose from a single trunk (figure 5). In 2% specimen, iliolumbar artery has given of obturator artery (figure 6).

**Discussion**

The origin of OB from the posterior division was observed in 0.5% by Kumar and Rath 2007. The present findings revealed a significantly higher incidence of Type V and lower incidence of Type II arrangement than reported in the previous studies. The obturator artery was more variable and arose from the inferior epigastric artery in 26%, from the external iliac artery in 8%, as a common trunk along with internal pudendal in 14%, from superior gluteal, inferior gluteal, internal pudenda arteries in 4% of cases and from iliolumbar artery in 2%. The present study findings were compared with the studies of previous authors (Table 1).

Understanding IIA anatomy is essential to minimize intraoperative blood loss and other complications (Bleich *et al.*, 2007). Internal iliac angiogram is done for various indications. To avoid confusion due to anatomical variations, the anterior and posterior divisions are referred to as superior and inferior trunks radiologically (Lynch *et al.*, 2006). Understanding IIA anatomy is essential to minimize intraoperative blood loss and other complications.

**Table 1**

Origin of obturator artery	Frequencies reported by different workers in %			
	Parsons Keith(1897)	Pick, Anson(1942)	Ashley and Braithwaite(1952)	Present study(2014)
Iliolumbar	4.9	1.8	3.5	2
Inferior epigastric	25	21.3	19.5	26
Direct form external iliac	1.6	0.9	1.1	8
By double origin	-	-	6.5	-

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