

## Case Report

# Combined contribution of both anterior and posterior divisions of Internal Iliac artery

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**Abstract:** Inferior gluteal, Internal pudendal and superior gluteal arteries are large caliber arteries of Internal iliac artery. "A unique variant contribution of both anterior and posterior divisions of Internal iliac artery in the formation of Inferior gluteal and Internal pudendal arteries" was found on the left side in a 55 year old male cadaver during regular dissection class of pelvic region for the first year medical undergraduates. To avoid accidental hemorrhage during pelvic surgeries and for interpretation of angiograms, it is necessary to have a sound knowledge of variations of Internal iliac artery and its branches for vascular surgeons and radiologists.

**Key Words :** Internal iliac artery, common trunk, anomalous

### Introduction

Internal iliac artery one of the terminal branches of common iliac artery, extends from the lumbo-sacral intervertebral disc to the superior margin of greater sciatic foramen [1,2]. During its course, it descends anterior to the sacro-iliac joint and divides into anterior & posterior divisions at the superior margin of greater sciatic notch. The Superior vesical, inferior vesical, middle rectal and obturator arteries arise from the anterior division, which terminates as Inferior gluteal and internal pudendal arteries [fig 1]. The inferior gluteal artery passes below the ventral ramus of the first sacral nerve, then between the piriformis and coccygeus and enter the gluteal region through the greater sciatic foramen. Internal pudendal artery provides blood to the external genitalia and is smaller in females than males. After its exit from the pelvis through the greater sciatic foramen, it crosses the dorsal surface of ischial spine and enters the perineum through the lesser sciatic foramen. Within the perineum, it traverses through the pudendal canal along with the internal pudendal veins and the pudendal nerve. The internal pudendal artery is sometimes smaller than usual, or fails to give off one or two of its usual branches; in such cases the deficiency is supplied by branches derived from an additional vessel, the accessory pudendal, which generally arises from the internal pudendal artery before its exit from the greater sciatic foramen. The Posterior division passes posterior to the greater sciatic foramen and gives off Ilio lumbar

and lateral sacral arteries and continues as Superior gluteal artery. In the present case Ilio lumbar artery arose from the common trunk of Internal iliac artery and both inferior gluteal and internal pudendal arteries were formed by the contribution of both divisions of Internal iliac artery.

### Case report

The present case was a unilateral variant formation of the inferior gluteal and the internal pudendal arteries by the contribution of both the anterior and posterior divisions of the Internal iliac artery. This was found during the routine dissection class of pelvic region for the first year medical undergraduates in a 55 year old male cadaver. Ilio lumbar artery arose from the main trunk of left Internal iliac artery, which was 2.5 cm below the bifurcation of common iliac artery [Figure 1]. Lateral sacral artery, superior gluteal artery and the posterior root of the common trunk of the inferior gluteal and the internal pudendal artery originated from the posterior division of the internal iliac artery [fig 2]. Anterior root of the common trunk of inferior gluteal and internal pudendal artery originated from the anterior division and no variation found in the branches and their course [fig 2]. No variation found in the branches & their course of right internal iliac artery. Thus by both the roots the common trunk is formed, which runs downwards for 2.2cm over the piriformis muscle and then bifurcated into the Inferior gluteal artery and the Internal pudendal artery. The course of inferior gluteal and internal pudendal arteries was normal.

## Discussion

The inferior gluteal, internal pudendal and superior gluteal arteries were categorized as large caliber vessels by Jastchinski in his study of polish subjects and he found that only the arteries of large caliber showed their regularity in their origin than medium and small caliber vessels, and classified the variations into four types<sup>3</sup>. Adachi modified the method by adding fifth variation by his study in Japanese subjects<sup>4</sup>.

Type I- The superior gluteal artery arises separately from the Internal iliac artery, the inferior gluteal and internal pudendal arteries are given off by a common trunk. If the bifurcation occurs above the pelvic diaphragm it is considered as Type Ia, whereas if it occurs below pelvic diaphragm it is classified as Type Ib.

Type II- The superior and inferior gluteal arteries arise by a common trunk and internal pudendal artery separately.

Type III- The three branches arise separately from the internal iliac artery.

Type IV- The three branches arise by a common trunk.

Type V- The internal pudendal and the superior gluteal arteries arise from a common trunk and the inferior gluteal has a separate origin.

The present case is a rather rare variant of Type I a of Adachi's classification. In this type the Inferior gluteal and the Internal pudendal arteries arose by a common trunk and the Superior gluteal artery arose separately. Even though various workers reported the incidence of type I from 51.2%<sup>4</sup> to 60%<sup>5</sup>, the present format of variation of the common trunk by the contribution from both the anterior and posterior divisions is not reported so far in the literature. The accidental hemorrhage is common during pelvic surgeries. Hemorrhage has been considered as the leading cause of maternal deaths in the developing countries<sup>6</sup>. The ligation of the internal iliac artery to control hemorrhage during pelvic surgeries has been described by Kelly HA as early as in 1894<sup>7</sup>. Recent reports opine that the efficacy of the internal iliac artery ligation during any obstetrics and gynecology surgery varies between 42 % to 75 %<sup>8,9</sup>. Knowledge of variations of Internal iliac artery and its branches is useful not only for anatomists, but also for pelvic surgeons during surgeries to prevent accidental hemorrhage and radiologists also for interpretation of angiograms.

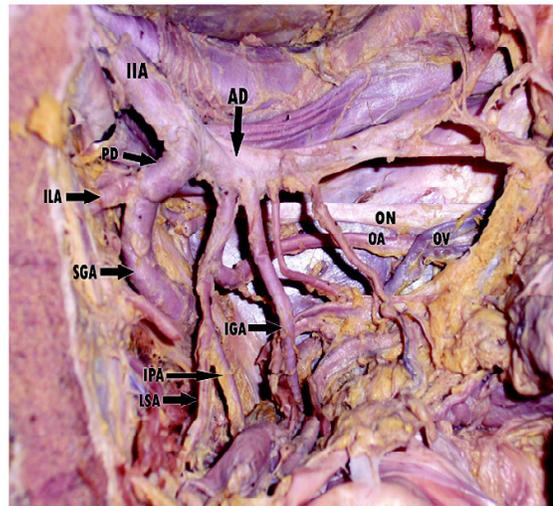


Figure 1: Showing normal course and branching pattern of Internal Iliac artery.

IIA: Internal iliac artery, ILA: Ilio lumbar artery, ON: Obturator nerve, OA; Obturator artery, AD; Anterior division of Internal iliac artery, PD: Posterior division of internal iliac artery, IVA: Inferior vesical artery, IGA: Inferior gluteal artery, IPA: Internal pudendal artery, SGA: Superior gluteal artery, OV: obturator vein.

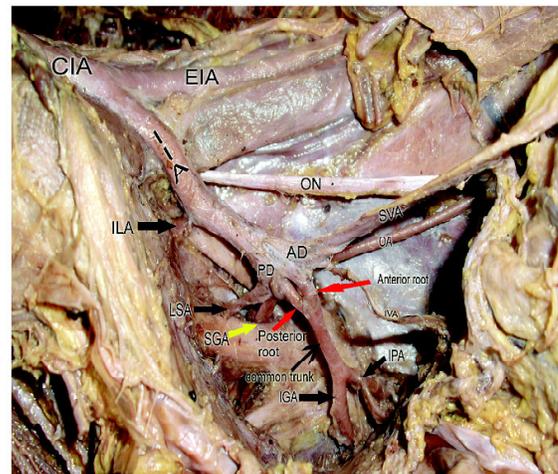


Figure 2: showing variant formation of common trunk of Inferior gluteal artery and Internal pudendal artery

CIA: Common iliac artery, EIA: External iliac artery, IIA: Internal iliac artery, ILA: Ilio lumbar artery, ON: Obturator nerve, OA; Obturator artery, AD; Anterior division of Internal iliac artery, PD: Posterior division of internal iliac artery, SVA: Superior vesical artery, IVA: Inferior vesical artery, IGA: Inferior gluteal artery, IPA: Internal pudendal artery, SGA; Superior gluteal artery

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