

CASE REPORT

A Missing Posterior Division of the Internal Iliac Artery

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WHAT THIS PAPER ADDS

In this case report, a rare, so far unreported, branching anomaly of the internal iliac artery on the left side of a male human pelvis is described.

Introduction: To date, multiple variations in the pelvic vasculature have been reported. In this case report, a rare, so far unreported, branching anomaly of the internal iliac artery on the left side of a male human pelvis is described.

Report: The complete posterior division of the internal iliac artery was shown to be missing on dissection of a 73 year old male cadaver. The iliolumbar artery, the lateral sacral arteries, and the superior gluteal artery originated unilaterally (on the left pelvis) directly from the common iliac artery.

Discussion: No alteration was observed in the supplied structures of the left pelvic region, including the respective muscles, the sacrum, or the hip joint.

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Article history: Received 26 July 2018, Accepted 23 August 2018,

Keywords: Branching anomaly, Common iliac artery, Internal iliac artery, Pelvic vasculature

INTRODUCTION

An accurate knowledge of pelvic vessel anatomy is crucial for different medical disciplines. Surgical interventions to pelvic organs in urology or gynaecology or direct interventions via pelvic arterial vessels (common, internal and external iliac artery) are frequently performed.

At the aortic bifurcation the abdominal aorta (AA) splits into the left and the right common iliac arteries (CIA), themselves branching after approximately 4 cm into the external (EIA) and internal iliac arteries (IIA). Subsequently, the IIA generally divides after approximately 4 cm into an anterior and a posterior division (> 60%), from which several final branches originate.¹ In most cases the posterior division of the IIA divides into the iliolumbar artery (ILA), the lateral sacral arteries (LSA), and the superior gluteal artery (SGL).

In this case report, a rare, so far unreported, anomaly of the IIA is reported with a missing posterior division leading to unusual vessel ramifications.

The study was approved by the local ethical committee and conducted according to the principles expressed in the Declaration of Helsinki.

CASE REPORT

A normal weight 73 year old white male with influenza A infection, pneumonia, and hypovolaemia as a consequence of bleeding oesophageal varices, died in hospital. According to his living will, the deceased became a body donor for the dissection course and for scientific research at the local Department of Anatomy and Cell Biology. The body was conserved using a formalin (3%) based conservation fluid. Before the dissection the dead body showed no external abnormalities. There was no evidence of any prior vascular surgery involving the pelvis.

During the dissection of the respective areas a missing posterior division of the internal iliac artery on the left side, but not on the right side, was observed. The appropriate vessels were further prepared by the authors. The photographic documentation was followed by the coloring of distinctive structures: red for arteries, blue for veins, and yellow for nerves (Fig. 1).

On the left side, because of the missing posterior division of the IIA, the ILA, LSA, and SGL originated from the CIA (Fig. 1A and B). Such an anomaly of these blood vessels has not been described previously in the literature.

Interestingly, on the right side the respective posterior division of the IIA was normal (Fig. 1C and D).

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<https://doi.org/10.1016/j.ejvssr.2018.08.004>

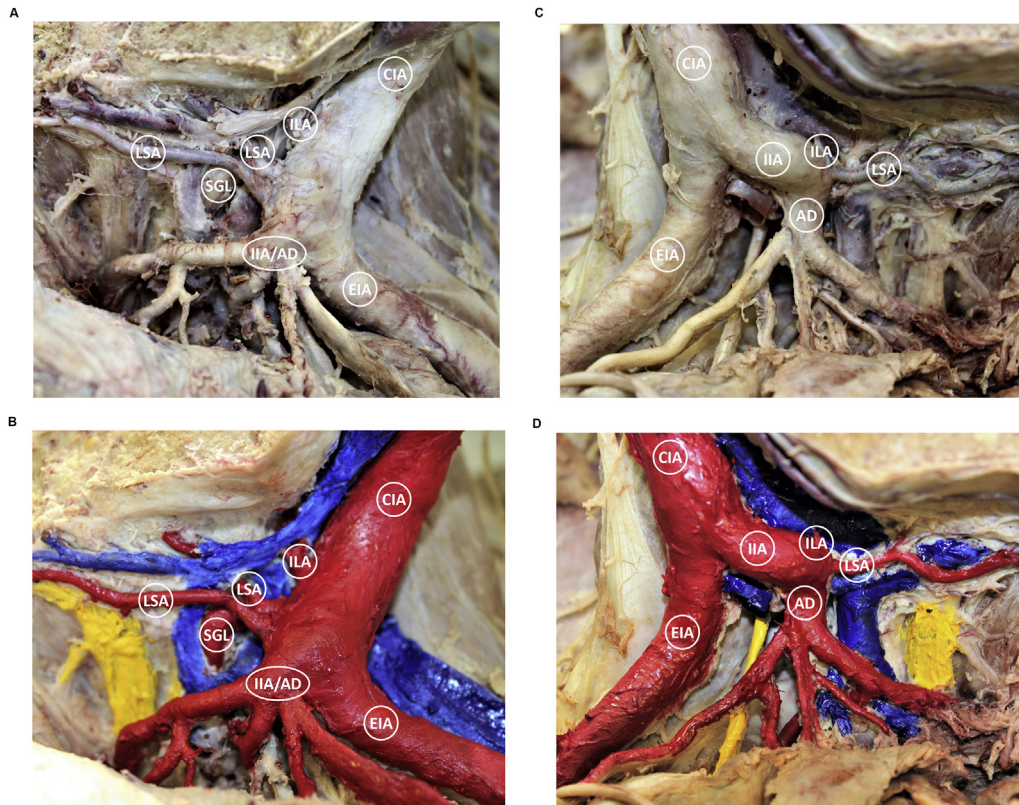


Figure 1. Comparison of the unusual vessel ramifications resulting from the missing posterior division of the internal iliac artery (A and B) on the left pelvic side and the usual vessel branches of the internal iliac artery (C and D) on the right pelvic side. AD = anterior division; CIA = common iliac artery; EIA = external iliac artery; IIA = internal iliac artery; ILA = iliolumbar artery; LSA = lateral sacral arteries; PD = posterior division; SGL = superior gluteal artery.

Remarkable differences were found in the circumferences of the common iliac and internal iliac arteries of the right and the left side. On the left side the CIA measured only 5.4 cm, whereas the right CIA was larger at 6.2 cm. Furthermore, the left internal iliac artery with the missing posterior division was smaller (2.8 cm), compared with the normally formed right side with a circumference of 4.0 cm.

During further section no differences between the supplied structures of the left pelvic region could be observed, including the respective muscles, the sacrum, and the hip joint.

DISCUSSION

To date, only a limited number of published studies exist reporting multiple variations in the pelvic vasculature. Mamatha et al.² investigated 50 formalin fixed bisected pelvises irrespective of side and sex. While the origin of the ILA from the main trunk of the IIA was reported as a rare variation (6%), the additional origins of the LSA and SGA from the trunk were not observed in that study.

A statistical study of the branching pattern of the human internal iliac artery by investigating 645 pelvic halves of Japanese cadavers was published by Yamaki et al.³ However, there was no report of a completely absent posterior division of the IIA.

In a case report, Nayak et al.⁴ described a rare variation in the left pelvic vasculature of a 70 year old male body donor,

with the anomaly of an ILA originating from the main trunk of the IIA, but the LSA and SGA originated from the posterior division of the IIA.

Kiray et al.⁵ reported that in 4.8% (2 ILAs) of the investigated 21 bilateral sectioned human body donors, the ILA originated from the CIA. Unfortunately, the other branches of the IIA were not investigated in that study.

The branching pattern of the posterior division of the IIA was investigated in detail by Bleich et al.⁶ In their study, the posterior division of the IIA was studied bilaterally in 54 female body donors. In all investigated cadavers a posterior division was detected on both sides.

Radhakrishnan et al.⁷ even reported a completely absent iliac arterial system on the right side of a 34 year old man.

Thus, multiple variations in the branching pattern have been observed, but not the ILA, LAS, and the SGL arising from the CIA.

ACKNOWLEDGMENTS

We would like to express deep respect to the human body donors for existential contribution to teaching and science at the Institute of Anatomy and Cell Biology of the MLU Halle-Wittenberg. Furthermore, we would like to thank the students involved in the dissection.

CONFLICTS OF INTEREST

None.

FUNDING

None.

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