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Case Report

A Rare Finding of Left Sided Anomalous Retro-Psoas Iliac Artery

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Abstract

Variant anatomy is a commonly reported incidental finding in radiology, with some anomalies holding more clinical relevance than others. Vascular anatomical variants must always be reported as they may be clinically relevant should the patient undergo an intervention in the future.

This case study depicts an incidental, extremely rare vascular anomaly, where the left common iliac artery takes an aberrant course posterior to the ipsilateral psoas muscle, and failing to divide into internal and external iliac arteries more distally.

Careful documentation and recording of this anomaly is crucial should the patient require any future lumbar spinal surgical interventions, vascular interventions or in case of renal transplantation.

Keywords: *Anatomy; Vascular; Computed Tomography (CT)*

Abbreviation

CT: Computer Tomography

Introduction

The anomalous retro-psoas iliac artery is an incidental of congenital vascular development, where the left common iliac artery takes an aberrant course posterior to the ipsilateral psoas muscle, whilst failing to divide into internal and external iliac arteries distally. Only a handful of cases have been described in literature. Furthermore this incidental finding is of relevance should the patient ever undergo spinal or vascular surgery.

Clinical Presentation

A 33 year old patient presented to the emergency department with a 3 day history of lower abdominal pain which progressed to right iliac fossa pain. The patient had no relevant prior medical conditions, surgical or family history. Clinical examination revealed guarding and tenderness on deep palpation of the right iliac fossa. No fever was detected and auscultation of the abdomen was normal. Urine dipstick

revealed the presence of leukocytes but blood tests did not show any significant abnormality. Subsequently a contrast enhanced CT of the abdomen and pelvis in the portal venous phase was performed to rule out acute appendicitis. CT did not reveal any acute surgical pathology however noted an incidental finding of a left sided cross-fused renal ectopia. The left kidney was enlarged and supplied by a single renal artery. There were bilateral pars defects of L5. The aorta was seen to bifurcate into right and left common iliac arteries at the level of L3. The left common iliac artery showed an anomalous trajectory, turning sharply at a 90 degree angle to the aorta in a postero lateral direction. The anomalous artery passed between the vertebral body of L3 and the psoas muscle. The normal right sided common iliac artery divided into internal and external iliac arteries at the level of the L4-L5 disc space. The anomalous left common iliac artery did not divide at all at all, instead coursing postero-medially to the psoas muscle and postero-lateral to the left iliac vein. Multiple small arteries branched off the aberrant left iliac artery. At the base of the sacro-iliac joints, the anomalous left common iliac artery coursed anteriorly to divide into the femoral artery at the level of the inguinal ligament. Images A-D, depicted in figure 1 show the aberrant course of the left common iliac artery in the axial plane. As this was an incidental finding, no angiographic phase was performed.

The patient was reassured and discharged home and advised to visit the emergency department once again should his symptoms get worse.

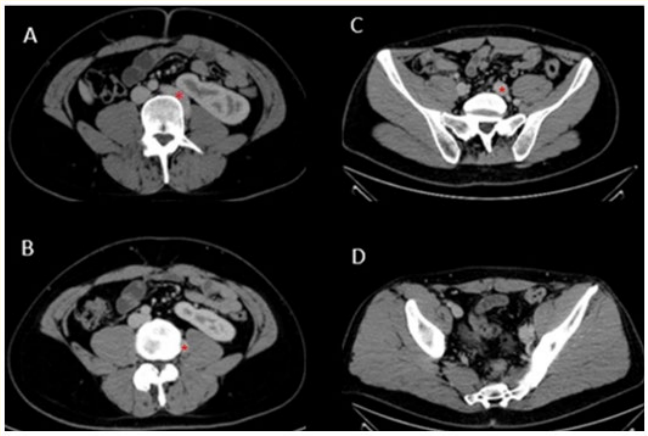

Figure 1: *Axial CT images. Image A shows the aorto-iliac bifurcation, with the left common iliac artery turning at a 90 degree angle to the aorta postero-laterally (*). Image B shows the left common iliac artery traveling in a plane lateral to the L4 Vertebral body and medial to the psoas muscle. Image C shows the aberrant left common iliac traveling in a retro-psoas plane. Image D shows the aberrant left retro-psoas iliac artery giving off a smaller caliber branch-off artery.*

Results and Discussion

During the 4th week of gestation, the branches of the lower aorta begin to form and coalesce from the most caudally situated ventral and vitelline branches, eventually forming the umbilical artery [1]. The umbilical artery continues towards the wolffian duct where the axial/sciatic artery branches towards the lower limb [1]. The sciatic artery continues as a large branch posteriorly. The external iliac artery originates as a small branch of the umbilical artery. It eventually enlarges greater than the size of the internal iliac artery and continues as the primary axial artery to the lower limbs [1]. The internal iliac artery originates from the umbilical artery ventral to the external iliac artery. The external iliac/femoral artery enters the lower limb at a later stage. The common iliac artery arises from a

secondary connection between the umbilical artery dorsal to the external iliac artery by connecting to the fifth lumbar intersegmental branches of the aorta [1,2]. Sonneveld., *et al*. postulated that the retro-psoas iliac artery could be formed as a result of an abnormal secondary connection between the fourth lumbar segmental artery [3].

A review of the literature found eight documented cases of a similar anomalous common iliac artery [3,6-13]. The uniqueness of this case lies in the fact that all were previously documented as right sided anomalous retro-psoas iliac arteries, whereas this case is left sided. All cases described a characteristic 90 degree angle at the aortic bifurcation where the anomalous artery originates. This was also described in this case. Furthermore, all cases described the course of the anomalous artery as being poster-medial to the psoas muscle, and just lateral to the vertebral bodies. Vohra and Leiberman [6] described a case of a right sided retro-psoas iliac artery with symptomatic stenosis requiring bypass grafting. This case was unique as no other patients were described as symptomatic. In this case, the authors were limited to the technology of their time, making use of plain film x-ray angiography rather than CT Angiography, hence their anatomical description was limited. Delasotta., *et al*. [7] described an incidental right sided retro-psoas iliac artery in a patient with worsening lower limb radiculopathy due to a foraminal disc protrusion in the lumbar spine. Knowledge of this extremely rare vascular anomaly was crucial in this case as the patient was thereby not deemed fit for selective nerve root block, due to the risk of inadvertent intravascular injection. Although a discectomy and fusion from an anterior approach was proposed, the risk of vascular complications was too high and the patient was managed with physiotherapy.

Vascular anomalies involving the common iliac arteries are rare, with very little documented incidence of abnormalities found in literature. This case of left sided retro-psoas iliac artery, like almost all other documented cases, had no significant outcome to the patient. As with all incidental findings however, it is crucial that this is documented, as future spinal surgical or vascular interventions will be affected. The learning outcomes of this case study are as follows:

- Importance of accurate documentation of all incidental findings.
- Importance of sound knowledge of normal anatomy and anatomical variants.
- Sound understanding of the clinical implications of vascular anomalies.

Conclusion

The case of the anomalous retro-psoas iliac artery presented here highlights the significance of recognizing congenital vascular anomalies during imaging studies. This incidental finding of a left common iliac artery taking an aberrant posterior course relative to the psoas muscle adds to the limited literature on this subject, as most documented cases involve right-sided variations. The absence of significant clinical symptoms in this patient emphasizes the rarity of symptomatic presentations associated with such anomalies.

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Conflict of Interest

No conflict of interest to declare.

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