

# Aberrant Iliac Artery: Far Lateral Lumbosacral Surgical Anatomy

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## abstract

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A 44-year-old man presented after 3 weeks of progressively worsening atraumatic onset pain in the right anteromedial thigh. The pain was sharp and radiated to the anteromedial shin and medial foot. The patient had no associated weakness, numbness, or bowel/bladder dysfunction. Nonsteroidal anti-inflammatory, pain, and neuropathic-relieving drugs had limited effect. He underwent interlaminar injections, which provided transient relief of his shin symptoms.

After conservative management failed, a spine surgeon (not affiliated with our practice) recommended an anterior lumbar interbody fusion via far lateral approach. The patient presented to our spine clinic for a second opinion. Closed magnetic resonance imaging revealed an aberrant iliac artery impinging on the lumbar plexus and a foraminal herniation at L4-L5 on the right, an orientation more lateral than expected or seen on the contralateral side. We recommended physical therapy that focused on core strength and adequate stretching prior to considering surgery. The patient's symptoms have since resolved. Common iliac artery anomalies are rare. No known incidence exists. The finding in this case was incidental and, if missed, could have led to vascular compromise. To prevent such an injury during minimally invasive (transpoas lateral approach) spine surgery, we recommend careful examination of radiographs for aberrant vessels.



**Figure:** Sagittal magnetic resonance image showing the abdominal aorta anterior to the L2 vertebral body (arrow).

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Vascular anomalies around the lumbar spine, such as those of the iliac arteries, are rare.<sup>1-4</sup> Index Medicus literature searches failed to reveal an incidence for such anomalies. The course of the common iliac artery begins at the distal portion of the abdominal aorta and extends inferolaterally for approximately 4 cm from the L4 vertebra to alongside the medial aspect of the psoas muscle, where it typically bifurcates anterior to the sacroiliac joint of the pelvis. The internal iliac artery (lateral to the lumbosacral junction and medial to external iliac vein) traverses the upper sacral regions. It is the primary arterial supply to the pelvis, where it provides blood to the viscera and most of the musculoskeletal anatomy,<sup>5</sup> whereas the external iliac becomes the femoral artery and supplies blood to the lower limbs.

The most commonly reported iliac artery anomaly is congenital hypoplasia/atresia.<sup>1-4,6,7</sup> Sonneveld et al<sup>8</sup> reported an aberrant iliac artery coursing posterior to the psoas and quadratus lumborum muscles. Vohra and Leiberman<sup>9</sup> reported a retro-psoas iliac artery that presented clinically as iliac stenosis with an intermittent claudication; whereas Benny et al<sup>10</sup> reported that vascular radiculopathies (including but not limited to epidural spinal hematoma, subdural spinal hematoma, spinal arteriovenous malformation, vertebral hemangioma, spinal epidural cavernous hemangioma, spinal epidural cavernous hemangioma, vertebral artery anomalies [tortuosity and dissection], aortic aneurysm, hemorrhagic synovial cysts, ligamentum flavum hematoma, and venous varices) in the lumbar spine occurred at an incidence of approximately 0.015%.<sup>11</sup>

This article describes an aberrant iliac artery that could have complicated access to the lumbar disk during a far lateral surgical approach.

## CASE REPORT

A 44-year-old man presented to another spine clinic after 3 weeks of pro-

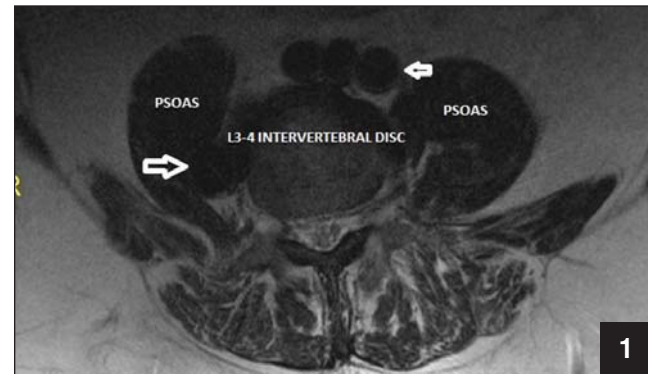
gressively worsening atraumatic onset pain in the right anteromedial thigh that was sharp and radiated to the anteromedial shin and medial foot. The patient had no associated weakness, numbness, or bowel/bladder dysfunction. Nonsteroidal anti-inflammatory, pain, and neuropathic relieving drugs had limited effect.

Open magnetic resonance imaging (MRI) revealed a right foraminal disk herniation at L4-L5. Interlaminar injections provided transient relief of his shin symptoms. Mild degenerative scoliosis was also noted. After conservative management failed, a spine surgeon (not affiliated with our practice) recommended an anterior lumbar interbody fusion via far lateral approach.

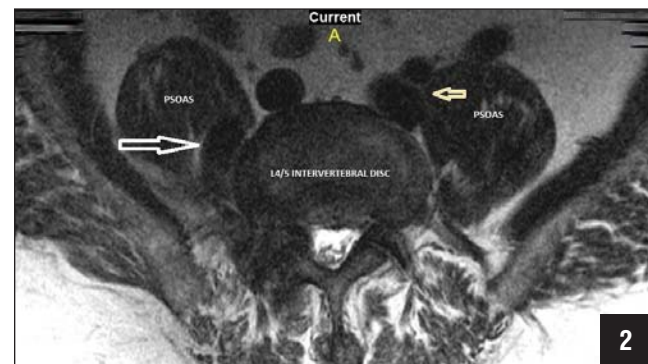
The patient then presented to our spine clinic. Closed MRI revealed an aberrant iliac artery impinging on the lumbar plexus and a foraminal herniation at L4-L5 on the right, an orientation more lateral than expected or seen on the contralateral side (Figures 1-4). We recommended physical therapy that focused on core strength and adequate stretching prior to considering surgery. The patient's symptoms have since resolved.

## DISCUSSION

Although anomalous iliac and iliolumbar arteries have been reported,<sup>7-9,12-14</sup> we are the first to report an aberrant common



**Figure 1:** Axial magnetic resonance image at L3-L4. Abdominal aorta branches into common iliac arteries (arrows). Left common iliac courses in its normal distribution (left arrow). The aberrant right iliac is lateral to the L3-L4 disk (right arrow).



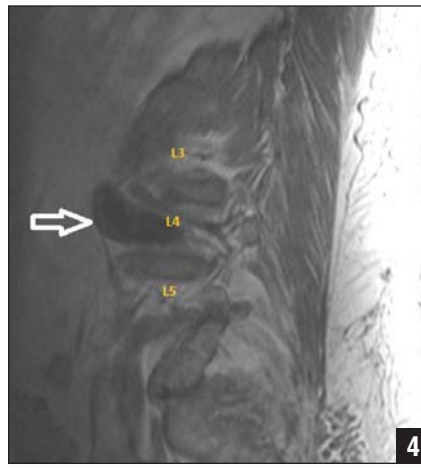
**Figure 2:** Axial magnetic resonance image at L4-L5. Right internal iliac remains between the psoas muscle and vertebral body (right arrow).

iliac artery located directly adjacent to the lumbar plexus that coursed through a potential far lateral (transpsoas) surgical approach for anterior lumbar interbody fusion, an approach that is gaining popularity throughout the United States. The finding was incidental and, if missed, could have led to a vascular complication.<sup>15-21</sup>

The initial MRI was inadequate to inspect vessel morphology. We ordered additional testing and appreciated the location of the aberrant right iliac artery. In our patient, the common iliac arteries likely branched from the aorta at L3-L4; however, on the right at the L3-L4 disk space, the iliac artery was found between the psoas major and vertebral body. Whether the arterial anomaly is congenital or due to a degenerative process is unknown;



**Figure 3:** Sagittal magnetic resonance image showing the abdominal aorta anterior to the L2 vertebral body (arrow).



**Figure 4:** Sagittal magnetic resonance image showing right common iliac artery abnormally coursing to the lateral aspect of L3 (arrow).


however, the mild degenerative scoliosis was unlikely to cause such a unique course. Furthermore, the common iliac artery becomes the internal iliac artery, which branches into anterior and posterior branches at the superior edge of the greater sciatic foramen. The typical anterolateral course for the common iliac artery is seen on the left side (Figures 1-4). To our knowledge, we are the first to report a common iliac artery anomaly that courses through a potential far lateral (transpsaos) surgical approach.<sup>22,23</sup>

Harrington<sup>13</sup> reported a case of iliolumbar artery incursion during a far lateral lumbar disk excision. While using a midline incision in addition to an extraforaminal exposure, it was noted that the iliolumbar artery entered the lateral margin of the surgical space before its branch point and was coincidentally adherent to the annulus. However, the author reported that the vessel was not visible in the surgical field. Arterial bleeding occurred when the annular disk fragment was removed with a pituitary rongeur under direct visualization with microscopic magnification. A laparotomy was performed to control bleeding, and the patient survived.<sup>13</sup>

We considered a few treatment options. Physical therapy was the appropriate first choice. A selective nerve root block was

avoided due to the high risk of inadvertent vascular injection. A far lateral (transpsaos) surgical approach would have been high risk. Fortunately, the radiculopathy subsided, and the patient reported significant improvement during conservative management; the radiculopathy was most likely due to the L4-L5 disk herniation because the vascular anomaly posed no reported trouble throughout the patient's lifetime.

### CONCLUSION

This case is a reminder that although anomalous abdominal vasculature is rare, it occurs. The finding in this case was incidental and, if missed, could have led to vascular compromise. To prevent such an injury during minimally invasive (transpsaos lateral approach) lumbar spine surgery, we recommend careful examination of radiographs for aberrant vessels. 

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