

# Arteriovenous malformation of the conus supplied by the artery of Desproges-Gotteron

## Case report

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The artery of Desproges-Gotteron is rarely mentioned in the literature and is unfamiliar to most neurosurgeons. The authors report a unique case of an arteriovenous malformation (AVM) of the conus in an adult woman, which received blood supply from an artery of Desproges-Gotteron. The patient presented with intermittent pain radiating down the right posterior thigh and foot and transient bladder incontinence. On examination, there was weakness of the right lower limb with hypalgesia of the plantar aspect of the right foot. Magnetic resonance imaging revealed a mass near the anterior aspect of the conus medullaris and angiography confirmed a spinal AVM at the L-1 level and a shunt located at the inferior L-3 level. The patient underwent transarterial embolization, and at 2-year follow-up, repeat angiography demonstrated no evidence of residual or recurrent spinal AVM, intermittent and tolerable pain without treatment interventions, and a normal neurological examination. The artery of Desproges-Gotteron appears to be a rare arterial variation. Moreover, the authors believe this to be the first case of a conal AVM supplied by such an artery. The anatomy and implications of such an arterial variant are discussed. (DOI: 10.3171/2010.11.SPINE10726)

**KEY WORDS** • arteriography • internal iliac artery • Desproges-Gotteron • arteriovenous malformation

**M**ENTION of the artery of Desproges-Gotteron is rarely found in the literature. This posterior radiculomedullary (radiculopial) artery, also known as the “cone artery,”<sup>6</sup> arises from the internal iliac artery or its branches (such as the iliolumbar artery),<sup>1</sup> courses alongside the L-5 or S-1 nerve roots up to the conus medullaris, and anastomoses with the perimedullary network (conal basket). This inconstant artery was first described in a thesis by Desproges-Gotteron in 1955.<sup>2</sup> The discrepancy of the clinical picture in which a patient presents with acute conus medullaris or cauda equina compression, but without imaging evidence of direct compromise of these structures, has been explained by compression of the Desproges-Gotteron artery. In this paper, we report on a patient presenting with a symptomatic AVM of the conus fed by the artery of Desproges-Gotteron.

Abbreviation used in this paper: AVM = arteriovenous malformation.

## Case Report

*History and Examination.* This 54-year-old woman presented with a history of chronic back pain and complained of intermittent pain radiating down the right posterior thigh to the foot, including the third, fourth, and fifth toes. She had recently suffered from transient bladder incontinence. Neurological examination found difficulty toe and heel walking on the right. She was found to have 3/5 weakness of right dorsiflexion and 4+/5 weakness of the right hamstrings and plantar flexion. Hypalgesia on the plantar aspect of the right foot was noted. Reflexes were 1+ in the left ankle and 2+ in the left knee with absent right knee and ankle reflexes. No long tract signs were present. Magnetic resonance imaging of her spine revealed a mass near the anterior aspect of the conus medullaris. Angiography confirmed a spinal AVM at the L-1 level and a shunt located at the inferior L-3 level (Figs. 1 and 2).



FIG. 1. Anteroposterior arteriograms noting the artery of Desproges-Gotteron (arrow, **B**) and its contribution to the AVM of the conus medullaris (arrow, **A**, and asterisk, **C**).

**Operation and Postoperative Course.** The lesion underwent transarterial embolization of an anterior spinal artery feeder at T-10 using Onyx (ev3). The patient was prescribed 300 mg of gabapentin for her neuropathic pain. At 2-year follow-up, a repeat angiogram demonstrated no evidence of residual or recurrent spinal AVM, and the patient's occasional pain was intermittent and tolerable without treatment interventions. Her motor and sensory examination was normal and reflexes were 1–2+ bilaterally. The patient did not report any urological issues.

### Discussion

In the 1950s, Desproges-Gotteron studied 91 patients with sciatica and motor loss from approximately 10,000 patients with sciatica examined in the departments of rheumatology, neurology, and neurosurgery at the Lariboisière Teaching Hospital in Paris.<sup>2</sup> A main finding from his study was that the size of disc herniation often failed to correlate with the occurrence of motor loss, leading him to suspect the potential for vascular factors. A subsequent cadaveric study of the L-5 and S-1 nerve roots found that, in 3 of 12 specimens, a vessel (the artery of Desproges-Gotteron) supplied the L-5 and S-1 nerve roots and extended to the ventral surface of the conus. Additionally, Desproges-Gotteron found that in approximately 15% of cases, the artery of Adamkiewicz was absent or originated higher than normal and that, in such cases, an artery that followed a lower lumbar nerve always contributed to blood supply to the lower cord.<sup>2</sup>

Reis et al.<sup>8</sup> reported on an adult man who presented with radicular pain and conus medullaris syndrome, including impotence and urinary retention. Magnetic resonance imaging demonstrated L5–S1 right foraminal and

extraforaminal disc herniation with no compression of the cauda equina. Foraminal decompression with microdiscectomy of L5–S1 was performed with relief of his radicular pain and normalization of bladder function.

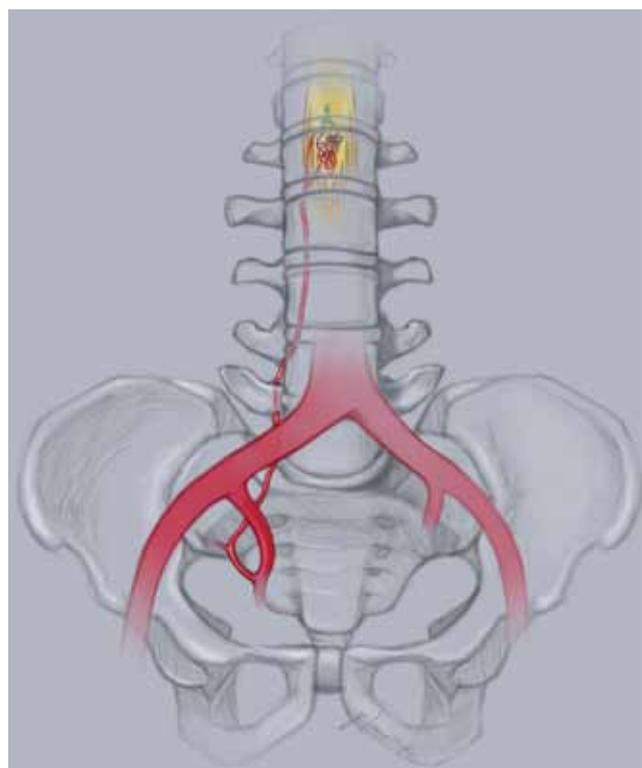


FIG. 2. Schematic drawing noting the origin and termination of the artery of Desproges-Gotteron. Note the contribution of this artery to the conal AVM representative of the case presented in this report.

## Artery of Desproges-Gotteron

Sexual function was improved after 1 week. The authors of this report attributed the clinical scenario to compression of the artery of Desproges-Gotteron. Balblanc et al.<sup>1</sup> reported a 67-year-old woman who developed worsening back pain and difficulty walking following vertebral manipulation. These authors also found this patient's presentation and course to be consistent with compression of the artery of Desproges-Gotteron by a L4–5 disc fragment migration following lumbar vertebral manipulation. Interestingly, transforaminal glucocorticoid injection at L5–S1 has resulted in infarction of the conus medullaris, with authors suggesting the artery of Desproges-Gotteron as the culprit.<sup>4</sup>

Newer classifications of spinal cord AVMs include those malformations of the conus as noted in the present case.<sup>9</sup> Comparatively, Mhiri et al.<sup>5</sup> reported a spinal dural arteriovenous fistula supplied by a branch of the internal iliac artery in an adult man with micturition dysfunction and progressive lower limb weakness. Magnetic resonance imaging of the lumbosacral spine demonstrated an AVM supplied by a lateral sacral artery and draining by 2 enlarged ascending perimedullary veins. No clinical improvement was observed after surgical removal of the lesion. The lateral sacral artery, however, is a normal source of blood supply to the cauda equina.<sup>3,7</sup>

We believe this to be the first report of an AVM of the conus medullaris that was supplied, in part, by the artery of Desproges-Gotteron. The clinician who treats such pathology should consider this rarity.

### Disclosure

The authors report no conflict of interest concerning the materials or methods used in this study or the findings specified in this paper.

Author contributions to the study and manuscript preparation include the following. Conception and design: Tubbs. Acquisition of data: Tubbs, Mortazavi. Analysis and interpretation of data: Tubbs,

Denardo. Drafting the article: Tubbs, Mortazavi. Critically revising the article: Denardo, Cohen-Gadol. Reviewed final version of the manuscript and approved it for submission: all authors.

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