Lumbosacral dural arteriovenous fistula

Clinical

The most common neurologic findings at the time of admission were paraparesis (85%), sphincter dysfunction (70%), and sensory disturbances (20%).

Clinical symptoms caused by deep lumbosacral spinal dural arteriovenous fistulas are comparable with those of spinal dural arteriovenous fistulas at other locations ¹⁾.

Diagnosis

Spinal dural arteriovenous fistulas located in the deep lumbosacral region are rare and the most difficult to diagnose among spinal dural arteriovenous fistulas located elsewhere in the spinal dura. Specific clinical and radiologic features of these fistulas are still inadequately reported.

Medullary congestion in association with an enlargement of the filum vein or other lumbar radicular veins is a characteristic finding in these patients. Spinal time-resolved contrast-enhanced dynamic MRA facilitates the detection of the drainage vein and helps to localize deep lumbosacral-located fistulas with a high sensitivity before DSA. Definite detection of these fistulas remains challenging and requires sufficient visualization of the fistula-supplying arteries and draining veins by conventional spinal angiography.

Medullary T2 hyperintensity and contrast enhancement were present in most cases. The filum vein and/or lumbar veins were dilated in 19/20 (95%) patients. Time-resolved contrast-enhanced dynamic MRA indicated a spinal dural arteriovenous fistula at or below the L5 vertebral level in 7/8 (88%) patients who received time-resolved contrast-enhanced dynamic MRA before DSA. A bilateral arterial supply of the fistula was detected via DSA in 5 (25%) patients ².

Outcome

Patients with deep lumbosacral dural arteriovenous fistula had a higher risk of early recurrence compared to patients with thoracolumbar SDAVF, with a considerable percentage of late functional deterioration. Thus strict clinical and radiologic long-term follow-up examinations are recommended in those patients ³⁾.

Case series

Jablawi et al. retrospectively evaluated all data of patients with spinal dural arteriovenous fistulas treated and/or diagnosed in RWTH Aachen University Hospital, and Paracelsus Kliniken, Osnabrück, Germany, between 1990 and 2017. Twenty patients with deep lumbosacral spinal dural arteriovenous fistulas were included in this study.

They retrospectively analyzed our radiological and medical records for patients presenting with SDAVF between 1990 and 2018 at the University Hospital Aachen. We identified twenty patients with a IsDAVF. All patients were treated surgically. One patient died of pulmonary embolism three months after treatment and was excluded from our outcome analysis. Clinical data at the time of admission, discharge, one year after discharge and at the last follow-up were evaluated according to the modified Aminoff-Logue disability score (AL-score) for this analysis.

The mean age was 65 ± 7 years (median, 67; range, 53-78), sixteen patients (84 %) were male. After surgery, four patients developed a recurrent fistula in the same shunt zone and were re-treated microsurgically. Follow-up data one year after treatment was available in 15 patients. No relevant changes in AL-score were observed within this period. For the long-term follow-up analysis, data of 13 patients were available; 38.5 % of patients developed late functional deterioration.

In this cohort, patients with deep lumbosacral dural arteriovenous fistula had a higher risk of early recurrence compared to patients with thoracolumbar SDAVF, with a considerable percentage of late functional deterioration. Thus strict clinical and radiologic long-term follow-up examinations are recommended in those patients ⁴⁾.

Rosi et al. describe a case series of five patients presenting with a conus medullaris AVS associated with a lower lumbar or sacral DAVF.

Three of the patients were <30 years old at presentation. In four of these five cases the intradural scAVS drained caudally, engorging the epidural plexus in the same location as the sDAVF. In only one case, who presented with thrombosis of the drainage of the main compartment of a conus medullaris pial AVF, was the location of the DAVF opposite to the location of the residual drainage.

They discuss the pathophysiological link between scAVS and sDAVF on the basis of the rarity of the DAVF, the uncommon association between scAVS and sDAVF, the presence of sDAVF in young patients, and the venous hypertension created by the venous drainage towards the sacral area responsible for angiogenesis creating the dural shunt ⁵.

Twenty-five consecutive patients with 16 thoracic dural arteriovenous fistula and 9 lumbosacral DAVFs were included (mean age, 63.9 years; 20 men). All patients presented with progressive myelopathy. Preoperative and postoperative neurologic deficits were compared between thoracic and lumbosacral DAVF groups. Using magnetic resonance imaging, the extent of T2 high-intensity areas and signal flow voids were documented. Follow-up after surgical interventions ranged from 6 to 96 months (mean, 38.1 months).

Preoperatively, patients suffering lumbosacral DAVF tended to be more severely disabled compared with thoracic DAVF patients. Lumbosacral DAVF patients exhibited diminished patellar (P = 0.04) and Achilles tendon reflexes (P < 0.01), while most thoracic DAVF patients exhibited hyperreflexia. In magnetic resonance imaging, signal flow voids around the spinal cord were evident in only 4 of 9 lumbosacral DAVF patients (P = 0.012). Rather, a serpentine signal flow void of the filum terminale was a hallmark of lumbosacral DAVFs to distinguish them from thoracic DAVFs. In the lumbosacral DAVF group, postoperative improvements were significantly better in micturition function (P = 0.02).

In lumbosacral DAVF, postoperative micturition function recovery was superior to thoracic DAVF. Intradural lumbar signal flow void is indicative of lumbosacral DAVF. For appropriate management, it is important to recognize these differences between lumbosacral and thoracic DAVF ⁶⁾.

Case reports

A 65-year-old man presented with a 4-year history of progressive sensory, motor, and sphincter dysfunction. Spinal magnetic resonance imaging and digital subtraction angiography showed 2 spinal dural arteriovenous fistulas (fed by the right L2 lumbar artery and the right lateral sacral artery, respectively) and 1 perimedullary arteriovenous fistula (fed by the filum terminale artery from the left L2 lumbar artery [i.e., filum terminale arteriovenous fistulas]. A hybrid technique was used to perform embolization of the right L2 spinal dural arteriovenous fistula and microsurgery of the L5 level filum terminale vein. The patient was asymptomatic 1 year later.

Multifocal spinal vascular malformations may coexist in 1 case, and standardized spinal digital subtraction angiography, including the bilateral internal iliac arteries and median sacral artery, should be performed to avoid a missed diagnosis. The concomitant phenomenon indicates that venous hypertension may be a risk factor for the development of arteriovenous fistulas. Hybrid techniques are effective in treatment of multifocal and complex spinal AVMs⁷⁾.

Seven cases of adult spinal vascular malformations presenting in conjunction with spinal dysraphism have been reported in the literature. Two of these involved male patients with a combined dural arteriovenous fistula (DAVF) and lipomyelomeningocele. The authors present the third case of a patient with an extraspinal DAVF and associated lipomyelomeningocele in a lumbosacral location. A 58-year-old woman with rapid decline in bilateral motor function 10 years after a prior L4-5 laminectomy and cord detethering for diagnosed tethered cord underwent magnetic resonance imaging showing evidence of persistent cord tethering and a lipomyelomeningocele. Diagnostic spinal angiogram showed a DAVF with arterial feeders from bilateral sacral and the right internal iliac arteries. The patient underwent Onyx embolization of both feeding right and left lateral sacral arteries. At 6-month follow-up, MRI revealed decreased flow voids and new collateralized supply to the DAVF. The patient underwent successful lipomyelomeningocele exploration, resection, AV fistula ligation, and cord detethering. This report discusses management of this patient as well as the importance of endovascular embolization followed by microsurgery for the treatment of cases with combined vascular and dysraphic anomalies⁸⁾.

References

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Jablawi F, Nikoubashman O, Dafotakis M, Schubert GA, Hans FJ, Mull M. Treatment strategy and longterm outcome in patients with deep lumbosacral arteriovenous fistulas. A single center analysis in nineteen patients. Clin Neurol Neurosurg. 2019 Nov 11;188:105596. doi: 10.1016/j.clineuro.2019.105596. [Epub ahead of print] PubMed PMID: 31739154.

Rosi A, Consoli A, Condette-Auliac S, Coskun O, Di Maria F, Rodesch G. Concomitant conus medullaris arteriovenous shunts and sacral dural arteriovenous fistulas: pathophysiological links related to the venous drainage of the lesions in a series of five cases. J Neurointerv Surg. 2018 Jun;10(6):586-592.

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doi: 10.1136/neurintsurg-2017-013505. Epub 2018 Jan 19. PubMed PMID: 29352055.

Endo T, Kajitani T, Inoue T, Sato K, Niizuma K, Endo H, Matsumoto Y, Tominaga T. Clinical Characteristics of Lumbosacral Spinal Dural Arteriovenous Fistula (DAVF)-Comparison with Thoracic DAVF. World Neurosurg. 2018 Feb;110:e383-e388. doi: 10.1016/j.wneu.2017.11.002. Epub 2017 Nov 10. PubMed PMID: 29133002.

Li J, Li G, Bian L, Hong T, Yu J, Zhang H, Ling F. Concomitant Lumbosacral Perimedullary Arteriovenous Fistula and Spinal Dural Arteriovenous Fistula. World Neurosurg. 2017 Sep;105:1041.e7-1041.e14. doi: 10.1016/j.wneu.2017.06.149. Epub 2017 Jul 4. PubMed PMID: 28684369.

Krisht KM, Karsy M, Ray WZ, Dailey AT. Extraspinal type I dural arteriovenous fistula with a lumbosacral lipomyelomeningocele: a case report and review of the literature. Case Rep Neurol Med. 2015;2015:526321. doi: 10.1155/2015/526321. Epub 2015 Apr 8. PubMed PMID: 25949837; PubMed Central PMCID: PMC4407406.

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