Filum terminale arteriovenous fistula

Filum terminale arteriovenous fistulae are a rare type of arteriovenous shunt generally characterized by a single direct communication between the artery of the filum terminale and a single draining vein. These intradural arteriovenous shunts are three times more common in men than women (mean age 55 years). Symptoms are related to venous congestion, vascular hypertension, and a putative chronic steal phenomenon which result in spinal cord ischemia and myelopathy. Interestingly, hemorrhage has never been reported as a mode of presentation. MRI demonstrates increased flow voids and T2 changes involving the conus and the lower spinal cord, and these findings are not dissimilar from those seen with the more common type 1 spinal dural arteriovenous fistulae. Thus conventional spinal angiography is necessary for a definitive diagnosis and to localize exactly the site of the fistula. Both surgical interruption of the fistula and endovascular embolization are safe and effective therapeutic modalities. However, because of the very small caliber of the feeding artery, endovascular therapy is often not feasible; and thus, surgery remains the method more commonly utilized for their treatment. Definitive treatment consists of obliteration of the direct arteriovenous shunt [1].

Only a few cases of AVFs of the filum terminale have been reported. These AVFs usually consist of a single communication between the anterior spinal artery and a single draining vein.

They present with progressive neurological signs and symptoms in the lower limbs with or without autonomic dysfunction. Diagnosis is frequently overlooked and delayed due to its rarity. A few cases have been misdiagnosed and operated for lumbar stenosis and disc prolapse resulting in a failed back surgery syndrome [2] [3].

Endovascular embolization, surgical disconnection of the fistula or a combination of both techniques have been described in their treatment with good outcomes [4] [5].

A 48-year-old male patient who presented with clinical features of a conus medullaris/cauda equina lesion. He had upper and lower motor neuron signs in both the lower limbs with autonomic dysfunction. The patient was misdiagnosed and was operated twice earlier for lumbar canal stenosis and disc prolapse. After reviewing his clinical and radiological findings a diagnosis of FTAVF was made. He underwent surgery and there was a significant improvement in his neurological functions. We discuss the case and review the literature on FTAVF's [6].

Lim et al. retrospectively analyzed the clinical and radiologic features and treatment of 4 patients with spinal AVFs of the filum terminale. Clinical manifestations and MR images are similar to those of spinal dural AVFs. All patients underwent surgical or endovascular treatment, resulting in complete occlusion. Clinical outcomes were good to excellent in all patients [7].

Chanthanaphak et al. retrospectively reviewed data obtained in 10 patients with FTAVFs diagnosed between January 1990 and December 2011.

Most patients (70%) were male, and the age of the population ranged from 31 to 72 years (mean 58.2 years). Clinical presentation was progressive paraparesis and sensory loss in the lower extremities in

9 cases, back pain in 7, radicular pain in 3, bowel/bladder disturbance in 5, and impotence in 1. The duration of symptoms varied between 2 and 24 months. Initial MRI studies showed intramedullary increased T2 signal, swollen cord, and dilated perimedullary veins in all patients. One patient had syringomyelia, presumably caused by venous hypertension transmitted by the perimedullary venous system. Embolization was attempted in 7 patients and was curative in 6 patients. Surgery was performed in the other 4 patients in whom embolization was unsuccessful or deemed not feasible. There was no treatment-related complication in either group. Symptoms, venous congestion in the cord, and syringomyelia improved on follow-up in all patients.

Embolization should be considered the treatment of choice for FTAVFs and can effectively treat the majority of patients presenting with an FTAVF. In a smaller group of patients in whom the angioarchitecture is unfavorable, open surgery is recommended [8].

Videos

Witek AM, Cerejo R, Elgabaly M, Bain MD. Diagnosis and Microsurgical Ligation of an Intradural Ventral (Type IV) Arteriovenous Fistula of the Filum Terminale: 3-Dimensional Operative Video. Oper Neurosurg (Hagerstown). 2018 Feb 16. doi: 10.1093/ons/opx300. [Epub ahead of print] PubMed PMID: 29471540 [9].

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