Spinal Dural Arteriovenous Fistulas (FAVDR) with Peri- Medullary Venous Drainage: Clinical, Radiological and Therapeutic Aspects (Case Report and Literature Review)

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ABSTRACT

Spinal dural arteriovenous fistulas are rare and often unrecognized, they occur predominantly in men, with an initial clinical picture most often misleading made of chronic myelopathy in the absence of treatment, the evolution is slowly towards a definitive paraplegia. We report the case of a patient referred for a table of spinal cord compression revealing a spinal dural fistula with perimedullary venous drainage treated urgently, due to the worsening of the clinical picture. The standard treatment consists of surgical or endovascular exclusion of the fistula (in our case the fistula was surgically excluded). From this case and based on the literature, we will specify the a, clinical, radiological characteristics as well as the prognosis of these malformations, and we will discuss the possibilities of therapeutic management.

Keywords: Case report, fistula arteriovenous, magnetic resonance, spinal dural fistula, spinal cord, spinal cord ischemia.

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I. INTRODUCTION

Spinal dural arteriovenous fistulas (AVFs) can be defined as abnormal connections between a root supply artery and the coronal venous plexus of the spine without an intermediate capillary bed. the dural nerve root sleeve is the actual site is the actual site of the fistula, the underlying pathophysiology of the symptoms and neurological signs is well understood.

Arterial blood flow is shunted into the venous plexus, under arterial pressure. The venous plexus then becomes "arterialized" and the obstruction of the venous flow leads to venous congestion, venous hypertension and progressive ascending myelopathy [1].

II. CLINICAL CASE

A. Anamnesis

Submit your manuscript electronically for review. This was a 39-year-old patient, with no notorious medical-surgical history, who had presented paresthesias of both lower limbs for 1 year associated with walking disorders, after which the patient did not consult until the worsening of his condition by

the installation 3 months ago of heaviness in both lower limbs associated with sphincter disorders such as dysuria.

B. Physical Examination

Clinically, the patient was conscious, with paraplegia rated at 2/5 and Babinski's sign in both lower limbs without upper limb involvement. In addition, the patient presented with acute urine retention that had progressed for several hours and required bladder catheterization.

C. Paraclinical Examination

This clinical picture led to the realization of an emergency spinal cord MRI (Fig. 1A and 1B) showing the existence of a hypersignal in T2 without enhancement after injection of gadolinium extended from D6 to the terminal cone in favor of a dural AVF, the patient was transferred to the vascular and interventional radiology department, with a view to performing a medullary arteriography (Fig. 1C and 1D) objectifying a vascular.

Malformation such as arteriovenous fistula, fed by the posterior radicular branch resulting from the 6th right intercostal, whose posterior and median topography shunt, projects opposite the spinous process of T6 with a venous drainage towards the posterior and anterior epidural plexus.

Fig. 1. Medullary MRI A) injected sagittal T2 view, B) injected T2 axial view, C) D): medullary arteriography.

D. Therapeutic Intervention

Following the angiographic results, as well as the worsening of the patient's clinical condition, it was decided to provide surgical treatment, consisting of a posterior approach, a laminectomy from D5 to D9 was performed, coagulation of an extradural fistula at the level of D8-D9, opening of the dura, visualization of the nourishing artery (branch of the radicular artery) at the level of D6, dissection of the nidus of the AVM which extended from D6 to D8, coagulation of the drainage veins and the nourishing artery then tight closure of the dura.

E. Follow-up and Outcomes

The postoperative course was marked by an improvement in clinical symptoms, mainly related to motor disorders with motor and urinary kinesitherapy sessions.

The postoperative radiological follow-up is planned to consist of a control arteriography which can show the exclusion of the fistula, a medullary MRI looking for the disappearance of the MRI abnormalities.

III. DISCUSSION

Spinal dural arteriovenous fistulas present with non-specific symptoms, the most striking discovery in this case report was that a year had passed before the diagnosis of SDAF was made. This late diagnosis can be explained by the rarity of this disease, which is characterized by non-specific signs and symptoms, for example the initial phase is marked by difficulties in climbing stairs with walking disorders, and sensitive symptoms such as paresthesias, but also radiculalgia which may initially affect only one lower limb or both. Lumbar pain without radiculalgia is also frequently encountered, these different neurological symptoms are progressive over time and most often ascending. This disease can manifest itself late in bowel and bladder incontinence erectile dysfunction, urinary retention. Sudden onset of the disease or progressive development interrupted by intermediate remissions are possible, but typically deficits are slowly progressive [2]-[4].

The repetition of MRI, the use of certain sequences or even early arteriography make it possible to make the diagnosis before the onset of irreversible lesions. The management is multidisciplinary. The aim of the treatment is to definitively exclude the arteriovenous shunt to allow the normalization of the pressure in the perimedullary venous network the treatment of FDSV can be based on 2 procedures: the first is the surgical occlusion of the intradural vein which received blood from the shunt area, which is a relatively simple and safe procedure but with a risk of sacral fistulas [5]; the 2nd is endovascular therapy which uses a liquid embolic agent after performing a superselective catheterization of the radiculo-meningeal nourishing artery [6]. It should be noted that a recent meta-analysis suggested complete occlusion of the fistula after surgery in 98% of cases, while Endovascular treatment success rates vary between 25% and 75% [7] in our case, we opted for surgical treatment thus avoiding the risk of neurological worsening and re-permeabilisation which includes endovascular treatment [8].

IV. CONCLUSION

The diagnosis of FADS is often difficult with too long a delay between the first symptom and the treatment which results in severe neurological sequelae despite a well-conducted treatment, appropriate procedures must be adopted to shorten this delay.

Peri- medullary venous return RDFs should be considered in front of any atypical medullary or radicular picture in elderly subjects, the functional prognosis depending on the duration of the spinal cord suffering.

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