Purpose:
To precise the anatomical characteristics and diagnostic criteria of the various types of spinal cord arteriovenous shunts (SCAVS) on MRI and MRA. To define the interest of different sequences and technical parameters to obtain the necessary informations to properly diagnose those lesions.

Outline of contents:
-to explain the various types of SCAVss and their consequences on the cord
-to emphasize the various MR steps to properly diagnose the lesions and explain the symptoms created
-to precise the current place of MRA in the diagnostiic and therapeutic evaluation of SCAVSs

Summary:
SCAVS are responsible for various acute or progressive neurological symptoms. MRI is the first examination to perform if a spinal cord lesion is suspected. Knowing the imaging characteristics of these vascular lesions proves helpful to realize the useful sequences, especially by MRA.

SCAVSs can by classified according to their localization (in the paraspinal, epidural, dural, or intradural space), and the morphological type of the shunt (fistula or nidus).
A vascular lesion is easily suspected when tubular or ovoid T1 or T2 flow void structures are detected inside or around the cord. Absence of these abnormal vessels may not always eliminate the diagnosis of SCAVSs as some cases of MR occult microshunts may be directly responsible for ischemia, hemorrhage or edema without clear demonstration of flow void structures. The effects of the shunt are best diagnosed on T2WI, and their precise location on axial views will help to better understand the pathological process. Because of the anatomic disposition of the intrinsic and extrinsic cord vasculature, suffering zones at the anterior or posterior borders of the cord may mostly be considered of respectively arterial or venous origin. The type and architecture of the shunt are however not precisely depicted on classical MR sequences, and MRA is needed to diagnose exactly these lesions.

We will explain the choice of sequences and parameters of MRA, their advantages and the pitfalls in order to obtain the best visualization and analysis of the lesion. Indeed, it is necessary to distinguish arteries from veins, to recognize true niduses from ectactic venous clusters that can mimick niduses. Temporal resolution associated with high spatial resolution is thus needed for these differential diagnoses.

Each type of lesion will be commented, explained and detailed.

Because the treatment of those lesions relies especially on endovascular treatment, MRI and MRA will help to properly planify the angiography procedure.