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Case Report

Cavernous angioma of the conus medullaris as a cause of paraplegia

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Cavernous angiomas of the conus medullaris are unusual lesions, representing about 3% of all intramedullary cavernomas. Most are asymptomatic. Magnetic resonance imaging (MRI) is the best diagnostic tool for the detection. We report a case of a 74-year-old man who initially developed low back pain and numbness of the right leg and subsequently paraplegia, ASIA impairment scale 'c'. MRI revealed a cavernous angioma of the conus medullaris with perilesional oedema and signs of acute bleeding. Clinical improvement was associated with changes in the MRI.

Keywords: cavernous angioma; conus medullaris; paraplegia; magnetic resonance imaging

Introduction

Cavernous angiomas are vascular malformations of the central nervous system (CNS) representing 5–12% of spinal vascular abnormalities.[1] They are more frequent in the brain than in other places of the CNS.[2] The most uncommon locations in the spinal cord are the lumbar spine and the conus medullaris (3% of all intramedullary cavernomas each).[3] Histologically, cavernomas are compact irregular sinusoidal vascular channels with no neuronal parenchyma between them (as opposed to telangiectasias).[4,5]

We present the case of a 74-year-old man with a cavernous angioma of the conus medullaris diagnosed by MRI and his clinical and radiological evolution.

Case report

A 74-year-old man developed low back pain and numbness of the right leg. It was diagnosed as a lumbalgia and treated with analgesics and B-vitamin complex. Two months later the pain persisted, hypoaesthesia and progressive paraparesis were present in both legs and finally evolved to paraplegia. In the MRI (Figures 1 and 2) a spinal intramedullary lesion between T8 and conus medullaris with heterogeneous images suggestive of methaemoglobin can be seen, compatible with subacute haemorrhage. In the conus medullaris a lesion with a characteristic signal intensity pattern of cavernoma can be seen, and is essentially diagnostic of these lesions: focal heterogeneity containing areas corresponding to subacute chronic haemorrhage (methaemoglobin); with a ring of markedly hypointense iron storage forms around, and without demonstrable feeding arteries or draining veins. There was hyperintensity in T2 weighted sequences compatible with oedema around it. Angiography was carried out, and was interpreted as normal.

Four months after the onset of clinical symptoms, the patient was admitted to our spinal cord injuries unit with a T10 motor level, an incomplete L1–L2 sensory level and contraction of the external anal sphincter (ASIA impairment scale 'c').[6]

A second MRI (Figures 3 and 4) demonstrated the same lesion in the conus medullaris. A medullar angioresonance study was performed with no abnormal findings, and the lesion was interpreted as a cavernous angioma with haematic remains. A complete CNS study was performed to exclude a multiple cavernomatous syndrome. This study was negative.

Six months after rehabilitation the patient had a global 4/5 muscle balance, walked with walker (with difficulty, normally he sits in a wheelchair) and all reflexes were normal, except for the right Achilles reflex. Sensitivity was normal except for a local area of numbness in the left foot and perianal area.

Discussion

Cavernous angiomas, or cavernomas are rare vascular malformations of the CNS, included into the cryptic or angiographically occult CNS vascular malformations (cavernous angioma, capillary telangiectasia, thrombosed arteriovenous malformations and venous angiomas.)[7] They represent 5–12% of all spinal vascular abnormalities, most of them arising within the

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vertebral bodies.[1,8] The most common location is the supratentorial cerebral parenchyma (59%), 39% are infratentorial and only 2% are located within the spinal cord.[2] Cantore *et al*[9] report 2.3 cavernomas in a series of 261 intramedullary tumors.

Among the intramedullary cavernomas, the cervicomedullary junction was involved in 8% of the cases, the cervical region in 32%, the thoracic region in 54%, the lumbar region in 3% and the conus medullaris in 3%.[3] Canavero *et al*[10] report four lumbar cavernomas in a series of 55 patients. Pagni *et al*,[11] in a review of the literature, report three cavernomas of the conus

Figure 1 Sagital T1 weighted image of the conus medullaris. Left: typical cavernoma image in MRI: focal central heterogeneity surrounded by hypointensity without feeding artery or draining veins. Right: Acute bleeding with expansion signs and oedema represented by a widespread hyperintense signal

Figure 2 Axial MRI T2 weighted image at the cavernoma's level. The caudal part of the cavernoma is seen as a little hypointense image, and behind it, a hyperintense signal which corresponds to methaemoglobin caused by bleeding

Figure 3 T2 weighted MRI 3 months after Figure 1. The hyperintense signal of acute bleeding has changed to a hypointense image which corresponds to haemosiderin

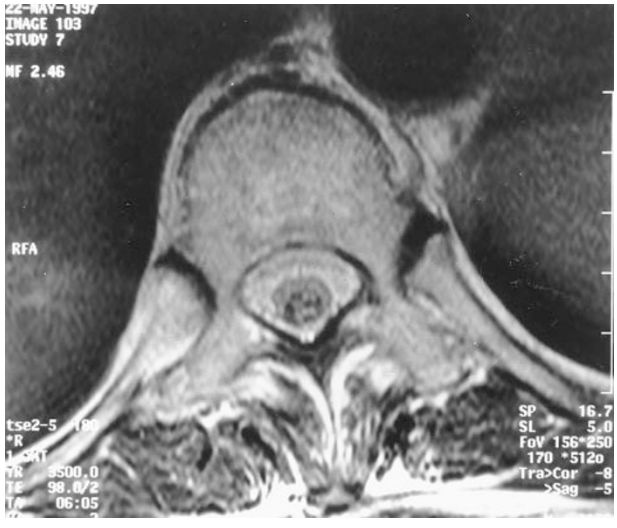

Figure 4 Axial T2 weighted MRI 3 months after Figure 2. The cavernoma seems to be bigger because it isn't compressed by blood. Residual haemosiderin appears as hypointense perilesional image

medullaris (in 28 intramedullary cases) and Ogilvy *et al*[3] report only one case (and it is the same as one of Pagni's series). In all the series, except in Cantore's one,[9] cavernous angiomas are more frequent in women.[1–3,5,10–12]

The clinical evolution of our patient reflects the evolution of the intramedullary lesion. An acute haemorrhage (visible in Figures 1 and 2) caused the onset of symptoms followed by a quick decline of the patient's condition (3rd type of clinical presentation described by Ogilvy *et al*).[3,9] If bleeding does not recur, the progressive resorption of blood induces a slow improvement in the clinical state, and if there are no new episodes of bleeding the patient will not suffer a relapse. Therefore, it is not the lesion but the bleeding which causes the clinical symptoms in these patients. This makes conservative treatment advisable (see below).

MRI is diagnostic. There are 21.4% of asymptomatic lesions,[2] but the number of undiagnosed cases decreases when MRI is used as diagnostic tool.[9,11] The cavernous angioma appears (T1 and T2 weighted signal) as a well defined lesion, with a reticulated mixed signal surrounded by a hypointense signal[1,9,11] (Figure 1 is T1 weighted, and Figures 2 to 4 are T2 weighted). The hypointense signal of the acute bleeding turns into a hypointense signal which corresponds to haemosiderin in the T2 weighted signal images (Figures 3 and 4).[3] Typically, spinal cavernous angiomas are angiographically occult.[1,2,7,10–13]

The absence of neuronal tissue amongst the vascular channels[4,5] allows a complete resection of the lesion with only slight neurological deficits after it.[1,3,9–12] However, complete removal is difficult and a subtotal removal can produce new haemorrhages. The use of intraoperative ultrasound facilitates the complete removal of the lesion.[12,14] Other treatments are radiotherapy,[1] and conservative rehabilitation therapy, expecting no recurrences of bleeding. No surgical treatments are indicated when the risk of new bleeding is lower than the surgical risk (an incidence of bleeding of 0.5–1% person year in supratentorial cavernous angiomas comparable with spinal angiomas). The concrete indications for surgery in the treatment of the asymptomatic cavernomas are not well established.[15]

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