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Coil embolization of vertebro-vertebral arteriovenous fistula: a case report

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Abstract

Background: Vertebro-vertebral arteriovenous fistulas (VVFs) are not uncommon, but they usually present with benign symptoms such as neck murmur. We report a case of VVF presenting with myelopathy which was successfully treated by embolization with detachable coils.

Case Presentation: A 72-year-old woman was admitted with complaint of bilateral leg weakness. Cervical magnetic resonance image showed compression of the spinal cord by a large vascular lesion. Right vertebral angiogram showed a vertebro-vertebral fistula draining into ectatic epidural veins. From a transfemoral arterial approach, the fistula site was selected with a microcatheter, and embolization was performed by placement of several Guglielmi detachable coils until flow arrest was obtained. The patient made a full recovery, and long-term angiographic follow-up demonstrated complete cure.

Conclusion: We present a case of VVF treated using detachable coils with good long-term results.

Keywords: Vertebro-vertebral arteriovenous fistulas; VVF; Endovascular surgery; Guglielmi detachable coils

1. Introduction

Spinal arteriovenous fistula is not particularly common. We treated a patient with a single vertebral high-flow fistula (vertebro-vertebral arteriovenous fistulas [VVFs]) using a detachable coil with good long-term results.

2. Case report

A 72-year-old woman complaining of a 1-week history of right-hand numbness consulted at the outpatient clinic and was admitted. She had suffered myasthenia gravis 4 years before and had undergone surgery for thymoma. At that time, jugular catheterization was performed and traumatic VVF must have developed. At the present admission, her consciousness was alert; there was weakness in the bilateral lower extremities, normal reflex, and no pathological reflex. Sensory disturbance in the right hand was demonstrated. Cranial nerve examination did not show any abnormal findings, but magnetic resonance imaging (MRI) showed an epidural flow void lesion in the cervical spine, with compression of the spinal cord (C6 level) (Fig. 1A, B). Right vertebral angiography demonstrated VVF at the C5 level. A single high-flow fistula was located in the intervertebral foramina, draining to the epidural venous plexus (Fig. 2A, B). Left vertebral angiography and right carotid angiography did not show any fistula. The diameter of the fistula was 2.5 mm and the diameter of the dilated vein was around 4 mm (Fig. 3). The draining vein had a notch at the intervertebral foramina (Fig. 1A). As the VVF had a single orifice, and the dilated vein had a notch at the intervertebral foramina, embolization of the fistula using a detachable coil was selected as the treatment because of her general condition and the shape of the VVF.

Embolization was performed under local anesthesia. A 6F catheter was advanced into the right vertebral artery, then a microcatheter (Tracker 18, Boston Scientific, Fremont, Calif) was advanced through the orifice, and 5 detachable coils (Guglielmi detachable coils) measuring 5 mm in diameter and smaller were placed in the vein. Flow through the fistula disappeared (Fig. 4A, B).

Weakness in the bilateral lower extremities and numbness in the right hand soon improved. Follow-up angiog-

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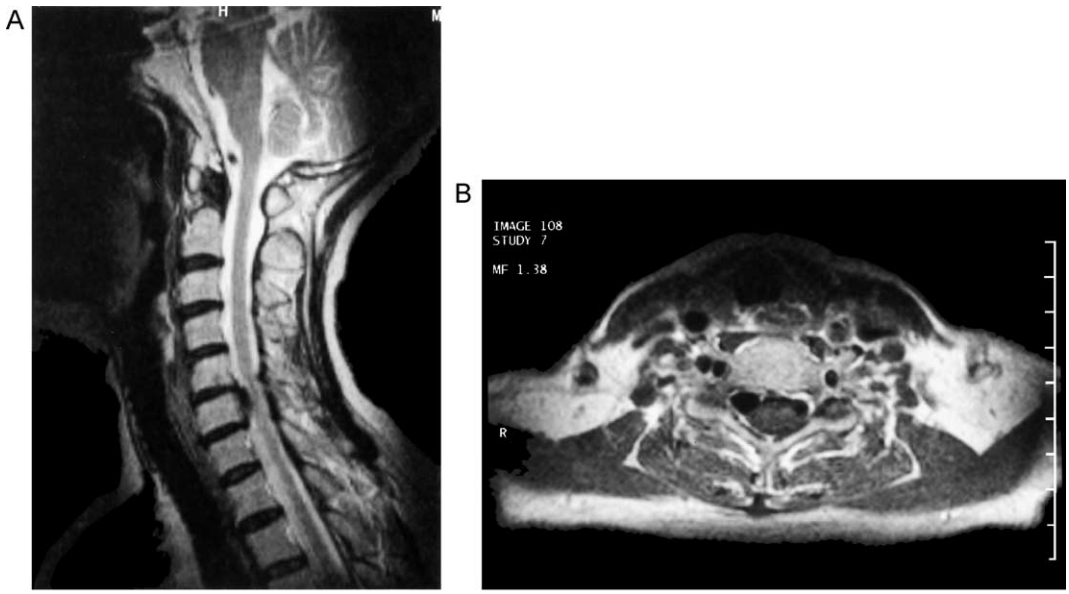

Fig. 1. A, MRI (sagittal view), flow void is shown at C6 level. B, MRI (axial view), flow void mass compresses spinal cord.

raphies 3 months and 4 years after embolization did not show any sign of fistula (Fig. 5), and there have not been any symptoms of recurrence for 4 years since embolization.

3. Discussion

Spinal arteriovenous fistula can now be diagnosed by MRI. On T2-weighted images, vascular flow void and hyperintensity revealing edema or malacia of the medulla spinalis suggest spinal arteriovenous fistula [6]. Spinal arteriovenous malformation (AVM) is classified as dural, perimedullary, or medullary AVM [7]. Dural and perimedullary AVMs can be treated surgically or endovascularly [11,12]. This particular patient was diagnosed as having VVF [4,9]. Gobin et al [4] reported 68% of VVFs are traumatic, while 32% are spontaneous. Previous central cannulation must have caused VVF in this case [4,10]. Vertebro-vertebral arteriovenous fistulas are mainly treated endovascularly [2,13,15]. Debrun et al [2] first treated VVF using a detachable balloon. Detachable balloons [1,2,4], stent grafts [3,16], and detachable coils [4,5,9,14] are embolic materials that have been used to treat VVF. To

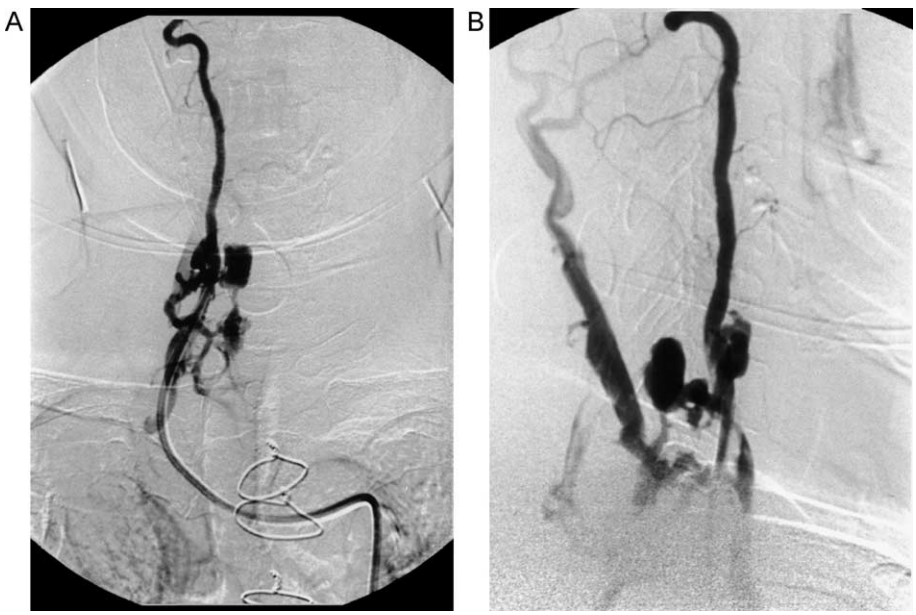

Fig. 2. Right vertebral angiography. A, Anteroposterior view; B, lateral view, dural AVM at C5 level is demonstrated.