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Clinical case

Surgical management of cervical radiculomedullary arterial aneurysm with subarachnoid haemorrhage: A case report

Prise en charge chirurgicale d'un anévrysme radiculo-médullaire responsable d'une hémorragie méningée : à propos d'un cas

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ABSTRACT

The aim of this paper was to report an unusual case of a 30-year-old woman admitted to the emergency department for a subarachnoid spinal haemorrhage. Clinical presentation was typical and the initial CT-scan did not show any intracranial lesions. Diagnosis was then confirmed by a full-spinal MRI that revealed a cervical radiculomedullary artery aneurysm. The diagnosis was also confirmed by an arteriography that showed a left C6 radiculomedullary artery aneurysm. Surgical management was performed and included a direct approach of the vascular lesion using an anterolateral cervicotomy and occlusion of the parent vessel. Histological examination confirmed the typical aspect of the aneurysm. The postoperative course was uneventful and the patient was discharged from hospital at day 15. This type of vascular lesion is very uncommon and requires a prompt diagnosis. Initial MRI can confirm the presence of a subarachnoid haemorrhage related to the aneurysm, which can be also visualized by an arteriography. Management of these vascular disorders requires a multidisciplinary specialized spine-team and is commonly performed using a direct surgical approach.

Mots clés :
Anévrysme
Hémorragie sous-arachnoïdienne
Rachis cervical

RÉSUMÉ

L'objectif de ce travail est de rapporter le cas d'une jeune femme de 30 ans hospitalisée suite à l'apparition brutale d'une hémorragie méningée d'origine rachidienne. Le tableau clinique typique, avec une imagerie crânienne ne mettant pas en évidence de lésion vasculaire, imposa la réalisation d'une IRM médullaire permettant le diagnostic d'anévrysme radiculo-médullaire. La réalisation d'une angiographie des vaisseaux du cou permit d'identifier cet anévrysme branché sur l'artère radiculo-médullaire C6 gauche. La prise en charge était chirurgicale avec un abord direct de l'anévrysme par une cervicotomie antéro-latérale, puis une exclusion de l'artère porteuse par mise en place d'un clip de 2 mm et une résection du sac anévrysmal. L'analyse histologique de l'anévrysme après son ablation permis de confirmer son caractère sacciforme typique. Les suites chirurgicales furent simples, permettant un retour de la patiente à domicile après 15 jours. Il s'agit d'une pathologie vasculaire rare dont le diagnostic doit être fait rapidement. La réalisation d'une IRM permet de confirmer la présence d'une hémorragie méningée spinale et montre généralement l'anévrysme, permettant de cibler l'angiographie médullaire. La prise en charge de ces lésions est le plus souvent chirurgicale et doit être réalisée de façon multidisciplinaire dans des centres spécialisés.

1. Introduction

Subarachnoid haemorrhage of spinal origin is very uncommon and represents less than 1% of all reported cases [1–5]. Most common aetiologies are bleeding of an intramedullary tumour, spinal

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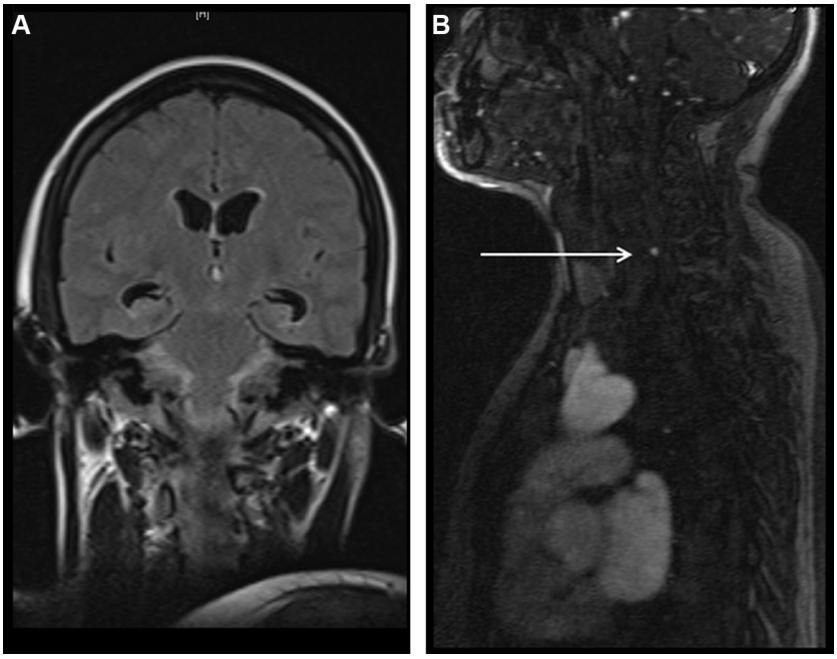

Fig. 1. A. Initial cerebral MRI showing the subarachnoid haemorrhage in the posterior fossa with no visible intracranial vascular lesion. B. Initial medullar MRI after gadolinium injection showing an enhanced formation in front of the posterior part of C6 vertebral body.
A. IRM cérébrale initiale en coupe coronale mettant en évidence une hémorragie méningée prédominant dans la fosse postérieure sans lésion vasculaire intra-cérébrale visible. B. IRM médullaire initiale en coupe sagittale après injection de gadolinium mettant en évidence un hypersignal en regard de la face postérieure du corps vertébral de C6 (flèche).

arteriovenous malformations (AVM), arteriovenous fistula [6], rupture of an aneurysm related to an AVM or an aortic coarctation [1,4,7,8]. Among the published cases, these solitary aneurysms are primarily located on the spinal artery. They are usually small with a diameter inferior to 3 mm and their shape is fusiform with lack of a defined neck [5]. These characteristics are in contrast to traditional intracranial aneurysms.

An isolated rupture of a radiculomedullary aneurysm is very rare and only one thoracic case has been reported to date in the literature.

The aim of this study was to report an exceptional case of subarachnoid haemorrhage caused by the rupture of a solitary radiculomedullary aneurysm with a saccular shape. Radiographic examinations and therapeutic management are also discussed.

2. Case report

A 30-year-old woman, with no previous medical history (no drug abuse, dyslipidemia, connective tissue, autoimmune or inflammatory disease), was admitted to the emergency department at our institution for a severe headache associated with nausea. Initial examination revealed a cerebral confusion, brutal neck pain and headache with associated pain in the lower limbs. Neurological examination was strictly normal, with no sensory, motor or sphincter dysfunction.

An injected cerebral CT-scan was immediately performed and confirmed the presence of a subarachnoid haemorrhage, mainly in the posterior fossa with a slight hydrocephalus (that did not require any specific treatment and appeared to regress spontaneously after a few days). However, the examination of intracranial vessels did not show any vascular lesion. A few hours after admission, the patient complained of an increase in neck stiffness and lower limb pain. A cerebral and spinal MRI (Fig. 1A and B) was therefore prescribed and revealed a major spinal subarachnoid haemorrhage with an associated haematoma of C6 left vertebral body and a left lateral medullary structure enhanced by gadolinium injection. Based on a suspected vascular lesion, an arteriography was then performed and showed a left C6 radiculomedullary artery aneurysm located on the ventral side of the spinal cord (Fig. 2A and B).

As endovascular treatment of the aneurysm was not possible due to the inadequate diameter of the vessel and in order to avoid further bleeding, an urgent surgical procedure was performed using an anterolateral cervicotomy. A complete corpectomy of C6 was performed in order to identify the ventral side of the spinal cord. Then, under microscopic magnification, the dural sac was opened and the aneurysm was identified on the left C6 radiculomedullary artery. Due to its small size, direct clipping of the aneurysm was not possible and a 2 mm vascular clip was inserted on the parent vessel. The aneurysm was then removed and sent for histological examination. Dural closure was performed using an over sewn dural sac and biological glue was then applied on the stitches. No cerebrospinal fluid lumbar drainage was used during the procedure. Vertebral reconstruction was finally carried out using a bone graft and cervical plate.

After 48 hours in the ICU, the patient was then transferred back to the neurosurgical department and postoperative course was uneventful. She was discharged from the hospital on day 15 after resolution of headaches, neck and lower limb pain. Results of histological analyses confirmed the normal structure of the aneurysm, excluding the possibility of an infectious origin.

Six months after the initial admission, the patient was readmitted for a full set of radiological examinations that confirmed the radical treatment of the aneurysm (Fig. 3) and a cervical fusion was visible on the CT-scan. One year postoperatively, the patient was free of symptoms and was able to return to her previous work activities.

3. Discussion

Clinical symptoms associated with the rupture of a spinal aneurysm seem to be correlated with the level of the subarachnoid haemorrhage [2,4]. Among cases reported in the literature, appearance of brutal spinal stiffness appears to be a major and classical