

Rupture of dissection aneurysm of the vertebral artery followed by formation of epidural hematoma of the cervical spine: case report

© **Sergey A. Goroshchenko, Larisa V. Rozhchenko, Andrey E. Petrov, Natalia E. Ivanova, Aleksey Yu. Ivanov**

Polenov Russian Research Institute of Neurosurgery, branch of Almazov National Medical Research Centre, Ministry of Health of Russian Federation, Saint-Petersburg, Russian Federation

Corresponding author. Sergey A. Goroshchenko, goroschenkos@gmail.com

Dissection aneurysms of the vertebral artery are a rare pathology occurring mainly in young people. Their most frequent manifestation is pain, which might be accompanied by cerebral ischemia events. Also rare is hemorrhage, with just one case described in literature. In our study, hemorrhage from a dissection aneurysm of the vertebral artery in a 37-year-old male led to the formation of an epidural hematoma of the cervical spine, which is unique and has never manifested itself when treating this pathology. Nevertheless, reconstructive surgery was a success, with the aneurysm removed and the vertebral artery lumen preserved.

Keywords: case report; dissection aneurysm; epidural hematoma; vertebral artery

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Introduction

The incidence of extracranial dissection aneurysms of the vertebral arteries is 1–1.5 cases per 100,000 people [1], with the absolute majority of them related to neck injuries. Sometimes, these aneurysms result from such pathologies as neurofibromatosis, Marfan syndrome, Ehlers–Danlos syndrome, fibromuscular dysplasia and arteritides of various etiology [2–5]. An acute pain in the neck accompanied by ischemic symptoms in the vertebrobasilar bed is the most common symptom of vertebral artery dissection [6–8]. Less frequent are such manifestations as a toothache, cervical radiculopathy and Brown-Sequard syndrome [9–11]. Bleeding from an aneurysm is very rare, for instance, by Y.J. Choi et al described bleeding into the muscles of the posterior surface of the neck which has been caused by a session of oriental medicine [12].

Our study looks at an atypical manifestation of dissection aneurysms of the vertebral artery – bleeding followed by the formation of an epidural hematoma of the cervical spine. While preparing the article for publication, we failed to find a similar description in accessible world literature and made a decision to share our experience by presenting the given clinical case.

Clinical case

A 37-year male was routinely admitted to A.L. Polenov Russian Research Institute of Neurosurgery (Saint-Petersburg, Russia) for surgical treatment. His medical history revealed that in August 2017 while feeling quite well and having no procatarxis, he experienced a sharp pain and then transient weakness in the right arm and leg. The arriving emergency team diagnosed “dorsalgia” and referred the patient to a neurologist of the



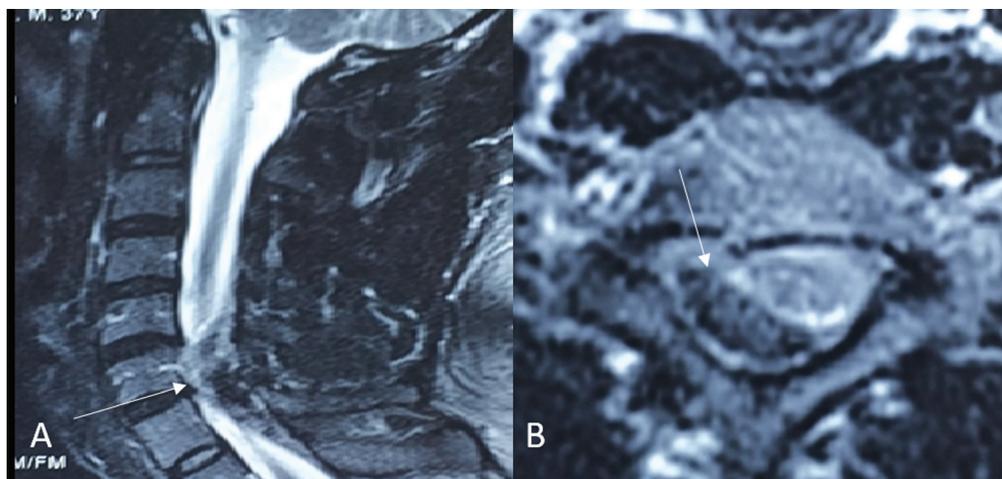


Fig. 1. Magnetic resonance imaging of the cervical spine: T2 weighted image, sagittal view (A); T2 weighted image, axial view, the white arrows show an epidural hematoma, dorsal position at C5-Th1 level (B)

municipal hospital. The patient underwent medical treatment, physio, and manual therapy without expressed effect, the pain syndrome remained. In two weeks of the disease onset, magnetic resonance imaging (MRI) of the cervical and thoracic regions of the spine showed an epidural hematoma on the level of C5-Th1 located dorsally and ousting the spinal cord ventrally and laterally (Fig. 1).

While performing magnetic resonance angiography of the neck vessels, an aneurysm of the V2 segment of the left vertebral artery was suspected, its location being on the level of C6-vertebral body (Fig. 2).

When admitted to our clinic 1.5 months after the onset of the disease, the patient had no neurological symptoms. He underwent selective angiography which confirmed a dissection aneurysm of



Fig. 2. Magnetic resonance angiography of the cervical spine: the white arrow shows an aneurysm of V2 segment of the left vertebral artery, which is located at the level of C6-vertebral body



Fig. 3. Selective angiography: the black arrow shows a dissection aneurysm of the left vertebral artery

V2 segment of the left vertebral artery. It was positioned medially, with 3x6 mm dimensions and the neck equal to 4 mm (Fig. 3).

According to a check MRI of the cervical region of the spine, the hematoma fully regressed (Fig. 4).

After receiving routine preoperative antiaggregant (clopidogrel 75 mg + acetylsalicylic acid 100 mg), the patient underwent surgery – stent-assisted endovascular embolization of the aneurysm. Control angiography showed that the aneurysm had been removed from blood flow (Fig. 5).

The postoperative period revealed no increase in neurological symptoms and the patient was discharged on the second day.

Discussion

Dissection of the vertebral arteries is one of frequent causes of cerebral circulation disorders in young people [13]. A pain in the neck is predominantly the cause of the disease, however, sometimes the cause remains unknown. Some authors describe the relationship between the formation of vertebral artery dissection and yoga, manual therapy, sneezing, coughing, vomiting and even ceiling painting [14].

Connective tissue disorders, such as Ehlers-Danlos syndrome and Marfan syndrome increase the risk of vertebral artery dissection development. Atherosclerosis and hypertension are also considered as risk factors for dissection lesions of extracranial arteries [15]. In our case, the patient had no phenotypic characters of connective tissue dysplasia or genetic disposition to it. Neither demonstrated he such predisposing factors as smoking or intake of medicines (for instance, oral contraceptives). It should be noted that the patient's father died of intracranial hemorrhage, and he himself suffered from II Stage arterial hypertension.

Accessible literature relating to hemorrhagic complications (vertebral artery dissections) gives just one case of delayed intracranial subarachnoid bleeding



Fig. 4. Magnetic resonance imaging of the cervical spine at hospital admission, T2 weighted image: epidural hematoma is not observed

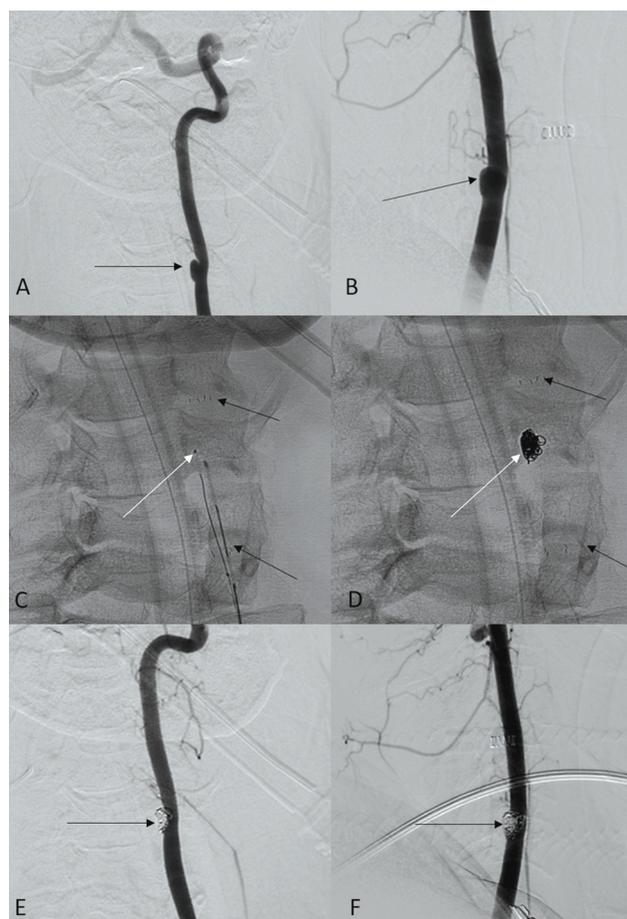


Fig. 5. Stent-assisted embolization of the left vertebral artery aneurysm: frontal view (A), lateral view (B): the black arrows indicate the aneurysm. Stent placement, frontal view: the black arrows indicate the stent marks, the white arrow shows the microcatheter mark located in the aneurysm (C). 4.5 × 37 mm Enterprise stent placement, lateral view: the black arrows indicate the stent marks, the white arrow shows the microcoils located in the aneurysm cavity (D). Check angiography: the black arrow points to the aneurysm removed from blood flow (E, F)

developed 7 years after cerebellar infarction determined by vertebral artery dissection, as well as bleeding in soft tissues of the posterior surface of the neck [12, 17].

There exist different approaches to treatment of vertebral artery dissections. In case of ischemic symptoms, some authors suggest performing conservative antiaggregant therapy and MRI check every three months, which are thought to lead to a positive clinical effect in most patients [1, 18]. Surgeons offer both reconstructive and deconstructive interventions on the vertebral artery. In our observation, no resection of the epidural hematoma was required, as it regressed by itself, the patient asked for help 1.5 months after the disease onset.

To eliminate the risk of repeated rupture of the aneurysm, as well as vertebral artery thrombosis, we preferred its endovascular removal from blood flow, while saving and reconstructing the lumen of the vertebral artery and achieving good angiographic and functional outcome. We refused using a flow-diverting stent, as the aneurysm filling would be likely preserved for a long time [19].

Conclusion

Spontaneous vertebral artery dissection is a rare pathology, however, acute and resistant to therapy pain syndrome in the cervical region in young patients does require a mandatory neurovisualization study (magnetic resonance angiography) to exclude vascular pathology. Despite an extremely rare case of hemorrhagic manifestation of vertebral artery dissection aneurysms, their timely and adequate treatment that enables to reduce the likelihood of adverse outcome should be always kept in mind.

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Conflict of interest:

The authors declare no conflict of interest.

ORCID ID

S.A. Goroshchenko, <https://orcid.org/0000-0001-7297-3213>

L.V. Rozhchenko, <https://orcid.org/0000-0002-0974-460X>

A.E. Petrov, <https://orcid.org/0000-0002-3112-6584>

N.E. Ivanova, <https://orcid.org/0000-0003-2790-0191>

A.Yu. Ivanov, <https://orcid.org/0000-0001-5777-2886>

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