

## Post Traumatic dissection of vertebral artery: A case report

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### Abstract

*This report presents a case of vertebral artery dissection (VAD), which was misdiagnosed as cerebrovascular accident (CVA) in initial examinations. In this case, a 33-year old woman, who was involved in a car accident, was referred to Khoy Legal Medicine Centre by traffic court two months after the accident. The patient was examined by the author, who was on an assignment at the centre. At this time, the patient had hemiparesthesia on the left side and was complaining of an increased appetite. CT angiography did not show right vertebral artery in vertebral foramen. The patient was diagnosed with right vertebral artery dissection accompanied by trauma based on the CT angiography results and the patient's background of neck trauma resulting from the accident.*

**Keywords:** Vertebral arteries; Dissection; Cervical vertebrae; Trauma; Basilar artery

### Introduction

The vertebral arteries arise from the subclavian arteries and join to form the basilar artery after passing throughout neck and entering the skull from foramen magnum<sup>1</sup>. The two vertebral arteries, together with the basilar artery, are the main blood supply to the posterior circulation of the brain. Vertebral artery dissection (VAD) is an increasingly recognized cause of stroke in patients younger than 45 years<sup>2</sup>. An expanding haematoma in the vessel wall is the major injury in VAD. This intramural haematoma can arise spontaneously or as a secondary result of minor trauma. Spontaneous VAD includes cases where there is no blunt or penetrate trauma. VAD has been associated with a 10% mortality rate in the acute phase. Death is the result of extensive intracranial dissection, brainstem infarction, or subarachnoid haemorrhage. Patients, who survive the crisis, rarely have long-term sequel. In this

report, a case of traumatic dissection of vertebral artery in a patient is described.

### Case History

A 33-year old woman was involved in a car accident while seated in the front passenger seat of a vehicle. Those accompanying her to the hospital stated that her consciousness had deteriorated. However, neurosurgeon's examination gave her a Glasgow Coma Scale (GCS) rating of 14 points<sup>3</sup>.

### Clinical Assessments

After hospitalisation, examination of the right eye confirmed periorbital ecchymosis<sup>3</sup>. As well, there was ambiguous tenderness around the cervical vertebrae. Chest, abdomen and limb examination showed no apparent abnormalities in these areas. The patient's plantar reflex showed an extensor

response. X-rays of the neck showed no signs of damage and brain CT scans were normal.

Two days after hospitalisation, the patient began to experience nystagmus, ataxia, deviation of the eyes to the right, and hemi-paralysis of the left side. After consultation with a neurologist, a diagnosis of cerebrovascular disease (CVA) and differential diagnosis of Multiple Sclerosis, the patient was treated with anticoagulant.

A magnetic resonance imaging (MRI) scan, performed one week after the accident, revealed<sup>4</sup>:

- \* A few high intensity foci in the frontal lobe

Increased T2 signals and abnormal flair in the medulla

- \* oblongata and inferior cerebellar hemisphere

These MRI findings were considered to be ischemic foci through differential diagnosis of the demyelinating lesion.

Four weeks after admission, the patient was released from hospital after responding well to CVA treatment. She was fully conscious but still had hemi-paralysis of the left side. Two months after release, the patient was referred to the Khoy Legal Medicine Centre by the traffic court for follow-up of the accident file, where she was examined by the author of this paper. At this time, the patient had hemiparesthesia on the left side and was complaining of an increase in appetite. The patient was then sent to the Neurological Centre of Tabriz Medical Science University for further examination.

CT angiogram (CTA) provided the following information<sup>5</sup>:

- \* Anterior, posterior, and middle brain arteries appeared to be normal

- \* Basilar artery was normal

- \* Right vertebral artery was hypo-plastic

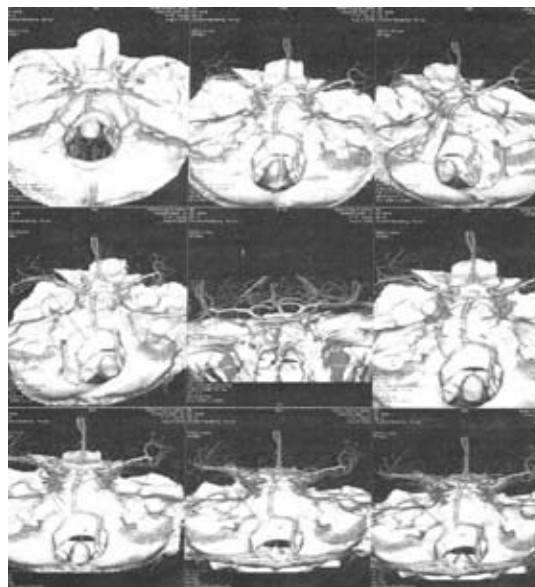


Figure 1.

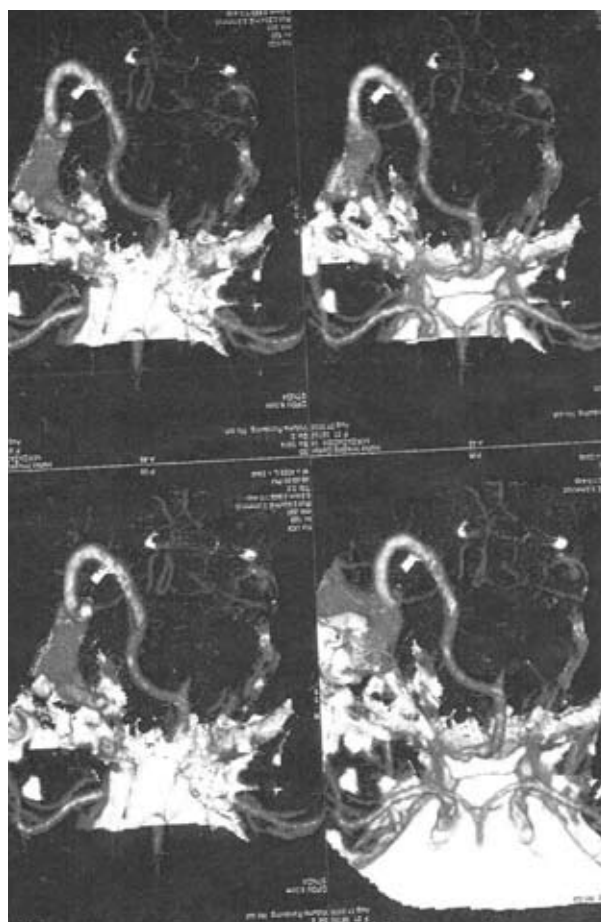


Figure 2.

Left vertebral artery was prominent

Elements of arterio-venous mal-formation (AVMs) were not visible

Common carotid arteries were normal on both sides

Diameter of Internal and external carotid artery was normal

Left vertebral artery branched off the subclavian artery and proceeded normally through the vertebral foramen

Right vertebral artery was not visible and vertebral foramens in the right contained soft tissue and no sign of the right vertebral artery

## Discussion

VAD is diagnosed when there is a background of falling accident or penetrating injuries. Focal neurological signs attribute to ischemia of the brain stem or cerebellum in 85% of patients<sup>2</sup>. In the case of patient in question, the neurological signs appeared as nystagmus and right side gaze, left side hemiparalysis and Ataxia<sup>3</sup>. The patient was diagnosed with CVA in clinical assessment done by treating physicians. MRI report indicated increase of T2 signal and flair signal abnormality in frontal region of skull, medulla oblongata and inferior cerebral hemisphere<sup>4</sup>, which were an indication of ischemia and demyelinating lesions. The neurological signs in the patient lessened after treatment with Anticoagulant, which compensated for ischemia in left vertebral artery<sup>3</sup>. The patient had only left side hemi-paesthesia when she was referred to

Khoy legal Medicine Centre. To find the reason for ischemia and its connection to trauma, the patient was sent to Neurological Sciences Centre at Tabriz Medical Sciences University for CT angiography, which did not show right vertebral artery in vertebral foramen<sup>5</sup>. In our opinion, mechanism of dissection was sudden motion of the neck in form of flexion followed by extension, which has caused dissection in the artery wall.

Based on the CT angiography results, the patient's background of neck trauma resulting from the car accident, no prior history of hypertension or usage of oral contraceptive pills (OCP), and absence of other risk factors, the patient was diagnosed with right vertebral artery dissection accompanied by trauma. Therefore in the report to the court, it was stated that the patient has encountered injury to vertebral artery and consequent problems following the car accident. In a follow-up after two months, the patient had hyperaesthesia on left side of the body and was being treated with Ticlopidine by neurologist.

## References

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