An uncommon aetiology of cervical radiculopathy: vertebral artery loop

Clinical History:

A 46-year-old man, without pathological history, consulted for chronic mechanical cervical pain evolving for 6 months, without irradiation and resistant to antalgics. The clinical examination did not find motor or sensory deficits. The biological check-up did not show inflammatory syndrome.

Imaging Findings:

The radiography of the cervical rachis (lateral view) shows a well-limited osteolytic image surrounded by a border of peripheral osteosclerosis in projection of the vertebral body of C3 (Fig. 1).

A cervical MRI shows a sinuous vascular structure in signal void at the level of the intervertebral foramen C3-C4 coming to the contact of the nerve root of C4 (Fig. 2). The radiological assessment is completed by a cervical CT angiography, which showed a loop of the left vertebral artery migrating to the left intervertebral foramen of C3-C4, which is widened, and eroding the left side part of the intervertebral body of C3 (Fig. 3).

Discussion:

The cervical radiculopathy can be due to rare aetiologies (congenital, cystic, neoplastic or vascular). Among these aetiologies, the loop of the vertebral artery can cause a bone erosion, a radicular compression, or a vertebro-basilar insufficiency [1]. Hadley [2] was the first one to describe the bone erosion of the cervical vertebra caused by a loop of the vertebral artery in 21 corpses.

The mechanism of the loop of the vertebral artery is not clear. Oga and al [3] reported the association of the loop with cervical spondylosis. The high blood pressure and atherosclerosis were also evoked. Sakaida and al [4] supposed that narrowing of intervertebral space can cause the elongation of the vertebral artery leading to the formation of the loop. The high blood pressure causes the migration of the vertebral artery and the erosion of the neighbouring bone structures [4]. The cervical trauma was also reported as cause of the arterial loop [5, 6]. Our patient had no history of either cervical trauma or high blood pressure. The patient just had a cervical spondylosis.

The clinical symptoms depend on the level of the anomaly; at superior levels, the patient may have dysphagia, glossopharyngeal neuralgia, Horner syndrome, neurogenic hypertension, occipital neuralgia, sensation of a pharyngeal mass, or spasmodic torticollis [7, 8]. At lower levels, there can be cervico-brachial neuralgias characterized by paresthesia and dysesthesia of fingers without a triggering factor, without nocturnal symptoms and
with rare neurological deficits [9, 10, 11].

Conventional radiography shows an erosion of the adjacent bony structures with osteolytic images encircled by a peripheral osteosclerosis. We can also observe a foraminal enlargement.

The cervical CT shows a tortuous vascular structure eroding the adjacent bony structures and widening the intervertebral foramen [12]. The multiplanar reconstructions allow to study the intrabony path of the arterial loop. On the MRI images, the arterial loop is in signal void. MRI allows to visualise the contact with the nerve root in the foramen and to approach the vasculo-nervous conflict there.

Magnetic Resonance Angiography or CT angiography must be realized to differentiate between a loop of vertebral artery and other vascular malformations. Multidetector CT allows to study the vascular anomaly and the bone repercussions [1].

The surgical procedures reported in the literature are micro-vascular decompression [13, 8], foraminotomy with section of the compressed root [14] and vascular reconstruction [4], but several cases evolved well under conservative management [10].

**Differential Diagnosis List:** Vertebral artery loop formation, Increased calibre and tortuosity of the vertebral artery due to increased flow associated with coarctation of the aorta, Vertebral artery aneurysm

**Final Diagnosis:** Vertebral artery loop formation

**References:**


Figure 1

Description: Radiography of the cervical rachis (lateral view): a well-limited osteolytic image surrounded by a border of peripheral osteosclerosis in projection of the vertebral body of C3 (arrow).

Origin: tizniti S, department of radiology, CHU HASSAN II FES, Morocco
Description: Cervical MRI shows a sinuous vascular structure in signal void at the level of the intervertebral foramen C3-C4 coming in contact with the nerve root of C4 (arrow). Origin: Tizniti S, Department of Radiology, CHU Hassan II, FES, Morocco
Description: A loop of the left vertebral artery migrating to the left intervertebral foramen of C3-C4, which is widened, and eroding the left side part of the intervertebral body of C3 (arrow). Origin: Tizniti S, Department of radiology, CHU HASSAN II, FES, Morocco