

DIAGNOSTIC CRITERIA FOR VISUAL DISTURBANCES IN VERTEBRAL ARTERY SYNDROME

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ANNOTATION

Vertebral artery syndrome is a condition associated with impaired conduction, manifested by signs of cerebrovascular insufficiency in the posterior part of the brain. Approximately 30% of cerebrovascular accidents causing transient ischemic attacks are associated with SPA. The disease often appears at a young age and reduces the ability to work. In addition, because it is progressive, it often leads to the development of transient ischemic attacks and even ischemic stroke.

Keywords: Vertebral artery syndrome; Visual disturbances; Diagnostic criteria; MRI of the cervical spine; Doppler ultrasound examination of brachiocephalic arteries; x-ray of the cervical spine

Significant prevalence of blood circulation disorders in the vertebral basin is the most urgent problem of cerebrovascular pathology today. According to various data, the frequency of dysgemia in the vertebrobasilar basin is from 25 to 30% of all cerebrovascular accidents, including up to 70% of transient ischemic attacks [3, 9, 11]. Atherosclerotic damage of vertebral arteries (VA), hypoplasia, abnormalities of the bone bed, damage to the craniovertebral junction, pathological curvature and displacement of the mouth of the vertebral artery occupy an important place in the causes of blood flow disorders in the vertebral arteries. basin (VBB) [1, 3, 9].

The most important etiopathogenetic factor in the development of these disorders is the pathology of the cervical spine, which has become significantly more common in recent years, especially in young people. The leading place in the pathogenesis of these diseases is occupied by degenerative-dystrophic processes of the cervical spine and abnormal processes of the atlas, which disrupts the blood flow in the vertebral arteries and causes cerebrovascular accidents [7, 8]. These changes belong to the group of compressive narrowing of the vertebral arteries caused by many extravascular factors and are combined with the term vertebral artery syndrome (SAS) [9]. In ICD-10, the vertebral artery syndrome is considered under the G99.2 code and the clinic of posterior cervical sympathetic syndrome, repeated episodes of vertebrobasilar insufficiency, episodes of falling attacks, Unterharnscheidt syndrome [13].



THE CONCEPT OF "VERTEBRAL ARTERY SYNDROME" includes:

1. Occlusive diseases of arteries (atherosclerosis, thrombosis, embolism, arteritis of various origins).
2. Deformations of arteries (pathological bends, folds, anomalies in structure and course).
3. Extravasal compression of arteries (compression by bone anomalies, ribs, muscles, osteophytes and articular processes of cervical vertebrae, scars, tumors, etc.) [7, 8, 9].

ANATOMICAL CHARACTERISTICS OF THE DEVELOPMENT OF VERTEBROGENIC SYNDROME of the vertebral artery.

In order to understand the pathogenesis of the development of PA compression syndrome, it is necessary to have an idea about the anatomical features of this vessel. There are extra (segments I-III) and intracranial (segment IV) sections of the VA. Segment I begins at the exit of the VA from the subclavian artery and ends at the level of the entrance to the bone canal. Segment II is located in the bone canal along the vertebrae C II C VI; segment III - from the point of exit from the bone canal of level C II to the entrance to the skull cavity (VA folds are located in this area); IV segment - intracranial - from the entry of the artery into the skull to the union with the VA of the opposite side. One of the most important structural features of the cervical spine is the presence of holes in the transverse processes of the VI-VII cervical vertebrae. These openings form a channel through which the vertebral artery passes with the main branch of the subclavian artery - the sympathetic nerve of the same name (Frank's nerve).

As the vertebral artery exits the canal, it forms a bend and goes to the foramen magnum. Then, at the lower edge of the bridge, both vertebral arteries unite to form the basilar artery. The vertebral basin is connected to the carotid via the circle of Willis. The vertebral artery vascularizes a wide area: segments of the spinal cord from C I to D III (upper medullary vascular pool), inner ear, structures of the brain stem with reticular formation and vital centers, occipital lobes, mediobasal parts of the temporal lobes, cerebellum, posterior regions hypothalamus region. A spinal nerve (posterior cervical sympathetic or Frank's nerve) leaves the stellate ganglion formed from the sympathetic centers of C III-D I segments of the spinal cord. The latter tightly connects the vertebral artery with its branches and enters the channel of the transverse processes. In addition, the branches involved in the formation of Luschka's sinuvertebral nerve depart from the vertebral nerve. The latter innervates the capsular-ligamentous apparatus of the cervical spine movement segments, the vertebral periosteum and the intervertebral discs.

The probability of PA damage in cervical osteochondrosis is determined by its topographical and anatomical position. A significant part of the extracranial segment of the VA passes in the mobile bone canal formed by the transverse processes of the cervical vertebrae and the rudiments of the ribs.



In this case, the lateral wall of the artery is adjacent to the vertebral articulation, and the back wall is adjacent to the superior articular process. At the C I-C II level, the artery is covered only by soft tissues, mainly the lower oblique muscles of the head. In the development of SPA, the condition of the perivascular plexuses and the lower cervical sympathetic ganglion, which determine the sympathetic innervation of the vertebral artery, is also of important pathogenetic importance.

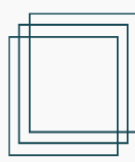
PATHOGENESIS Vertebral artery syndrome.

The main pathogenetic mechanisms of PA syndrome are compression of the arterial trunk, narrowing of the vascular lumen due to autonomic plexus and reflex spasm, which contribute to a decrease in blood flow to the posterior parts of the brain, and then cerebral vascular insufficiency [5, 8)

Osteophytes formed in osteochondrosis and deforming spondylosis have the greatest pressure effect on the vertebral artery. In cervical osteochondrosis, displacement and compression of the vertebral arteries can also be observed as a result of subluxation of the articular processes of the vertebrae. Due to pathological mobility between separate segments of the cervical spine (two vertebrae connected by a disc), the tip of the upper articular process of the spine under the vertebral artery is damaged. Most often, the vertebral artery is displaced and compressed between V and VI cervical vertebrae at the level of the intervertebral cartilage, between IV and V, VI and VII, and rarely elsewhere [1, 2)

Abnormal processes in the area of the atlas play a certain role, which disrupts blood flow in the vertebral arteries. Also, pathogenetic options for the development of PA syndrome in degenerative-dystrophic processes may be uncovertebral arthrosis, arthrosis of facet joints, pathological mobility, posterior extensor subluxation of articular processes according to Kovacs, blocks and instability of head joints. , disc herniation, compression of reflex muscles (inferior oblique muscles of the head, anterior scalene muscles), placement of vertebral arteries in the openings of the bone canal of the transverse processes of the cervical vertebrae, which easily move relative to each other. during head and neck movements. In addition, they are located close to the vertebral bodies. In this case, even under normal physiological conditions, compression and restriction of blood flow in one or both arteries occurs. As a rule, due to sufficient compensatory abilities, blood circulation in them is usually not disturbed. The position changes with hypoplasia (anatomical narrowing) of arteries or atherosclerotic stenosis.

Then extravasal factors (compression by articular processes in the case of instability of the cervical spine or osteophytes in the vertebral areas, etc.) become the decisive causes of blood circulation disorders in VBB [1, 11]. Compression of the vertebral arteries is also possible by neck muscles (scalenes, long neck, lower oblique muscles of the head), when they contract in certain head positions. The most common cause of vertebral artery syndrome is uncovertebral arthrosis.



Considering the very close functional and topographic-anatomical connections of this joint with the vertebral artery, it is clear that even small uncovertebral exostoses have a mechanical effect on the vertebral artery. Initially, osteophytes cause dynamic irritation of his sympathetic plexus only in certain positions or movements of the cervical spine. Pronounced osteochondral growth of the spineless articulation can cause severe compression of the lumen of the vertebral artery canal [8, 9]. Anomalies of Kimmerli, Powers, basilar impression can also be distinguished among the important factors of SPA [4]. In addition to mechanical compression, vasospasm can occur as a result of irritation of the periarterial nerve plexus. A combination of these factors is often observed [5].

CLINICAL CLASSIFICATION OF VERTEBRAL ARTERY SYNDROME (KALASHNIKOV V.I., 2009)

1. Pathogenetic factors of SPA (according to the nature of compressive effect on VA).
 1. Subluxation of the articular processes of the vertebrae.
 2. Pathological mobility of the spinal cord movement segment (instability, hypermobility).
 3. Compression by osteophytes.
 4. Spasm of the vessel as a result of irritation of the periarterial nerve plexus.
 5. Compression in the atlas region (Klippel-Feil anomaly, Kimmerli anomaly, atlas anomalies, platybasia).
 6. Osteoarthritis without spine.
 7. Arthrosis of facet joints.
 8. Blockades and instability of attachments.
 9. Herniated discs.
 10. Reflex muscle contractions.

2. Clinical stages of SPA.

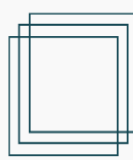
2.1. According to the degree of hemodynamic disorders.

2.1.1. Dystonic (functional).

2.1.2. Ischemic (organic).

Visual disturbances in vertebral artery syndrome.

Visual disturbances are limited to the following: darkening of the eyes, a feeling of sand, sparkles and other manifestations of photopsia, slight changes in the tone of the fundus vessels. Visual disturbances are characterized by atrial scotoma, fatigue and reduced vision in reading and other visual stress. Symptoms of conjunctivitis can be noted: pain and feeling of a foreign body in the eyes, redness of the conjunctiva, lacrimation. There are also episodes of paroxysmal loss of visual fields or their parts, often related to the position of the head [11].



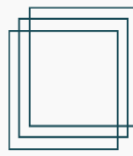
Diagnostics.

Functional X-ray of the cervical spine to confirm the vertebrogenic nature of the syndrome and the phenomena of instability of the vertebral motor segments. Detection of X-ray signs of osteochondrosis indicates a possible vertebrogenic nature of the syndrome. Signs of instability, spondylosis in the C6-C5-C4-C3 segments, as well as the presence of posterolateral uncovertebral osteophytes at this level should be etiologically significant for the occurrence of posterior cervical sympathetic syndrome. Doppler ultrasound examination of the brachiocephalic arteries is performed to rule out a possible stenotic lesion of the vertebral artery or subclavian abduction syndrome (criteria for occlusive-stenotic lesions of the vertebral arteries).

MRI of the cervical spine (spondylosis in the area of additional joints, arthrosis of DOS, spondylosis of articular processes, instability and hypermobility in CS, lateral IVD hernias, abnormalities of the VA bone bed, craniovertebral fusion, etc.)

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