The temporomandibular joint is a combination joint, representing the functional combination of two anatomically separate trochlear joints (left and right). The articulating surfaces of the head of the lower jaw (lat. cáput mandibuláre) and the articular tubercle (lat. tuberculum articulare) of the temporal bone are supplemented by fibrous intra-articular cartilage (lat. díscus articuláris) located between them, which, growing with its edges to the articular capsule, divides the articular cavity into two separate sections . Both temporomandibular joints function simultaneously, representing a single combined joint. Although the structure of the temporomandibular joint is condylar (rather, ellipsoidal), due to the presence of an intra-articular cartilaginous disc, movements in three directions are possible in it [2]:

frontal axis: lowering and raising the lower jaw (opening and closing the mouth) - occurs in the lower part of the joint, between the cartilaginous disc and the head of the lower jaw;

sagittal axis: displacement of the lower jaw forward and backward - occurs in the upper part of the joint, between the cartilaginous disc and the articular surface of the temporal bone;

vertical axis: lateral movements (rotation of the lower jaw) during chewing - on one side the head of the lower jaw together with the cartilaginous disc emerges from the articular fossa onto the tubercle, and on the opposite side the head of the lower jaw rotates relative to the articular cavity around the vertical axis.

The main elements of the joint are distinguished:

Mandibular block

Articular surface of the temporal bone

Capsule

Intra-articular disc

Ligaments

Ligaments

Near the temporomandibular joint, three ligaments are distinguished: the large lateral ligament (lat. ligamentum laterale) [3], which is directly related to the joint, and two small ligaments - the sphenomandibular ligament (lat. = lat. ligamentum sphenomandibulare) [4] and the stylomandibular (lat. = lat. ligamentum stylomandibulare)[5], lying away from the joint:

Large (lat. lig. laterale, lat. lig. temporomandibulare) is actually a thickening of the lateral part of the capsule, which has two parts: the external oblique and the internal transverse.

The two small ligaments (lat. lig. stylomandibulare et sphenomandibulare) are not ligaments, but artificially isolated areas of fascia, forming a loop that facilitates suspension of the lower jaw.

lat. Lig. The stylomandibulare separates the infratemporal region (anteriorly) from the parotid region (posteriorly), and begins from the styloid process to the angle of the mandible.

lat. Lig. sphenomandibulare starts from the spine of the sphenoid bone to the lingula of the lower jaw.

These ligaments play an important role in that they determine the boundaries of movement, or in other words, the extreme boundaries of movement of the lower jaw. Movements of the lower jaw can only be made within the functional limitations of the muscle attachments. An attempt to increase the degree of freedom causes pain and, thus, these limits are rarely achieved with normal joint function [6][7][8]. Connection of the middle ear (malleus) with the temporomandibular joint:

disco-mandibular ligament,

malleusomandibular ligament.

Capsule and cartilage disc

The articular capsule is attached along the edge of the fossa mandibularis to the fissura petrotympanica, enclosing the tuberculum articulare, and below it covers the collum mandibulae.

Innervation and blood supply

The joint itself has only sensory innervation. The sensory fibers innervating the joint emerge from the auriculotemporal and masticatory branches of V3 (from the mandibular branch of the trigeminal nerve)[2][9].

The joint is supplied with arterial blood from the external carotid artery, mainly from the superficial temporal artery. Other branches of the external carotid artery that supply blood to the joint are the deep auricular artery, anterior tympanic artery, ascending pharyngeal artery, and maxillary artery.

Venous outflow is carried out into the venous network rete articulare mandibulae, which entwines the joint, and then into the v.retromandibularis.

Diagnosis of diseases

Diagnosis of the TMJ condition is carried out using methods such as radiography, computed tomography and magnetic resonance imaging. The most informative is MRI of the temporomandibular joint[10], which allows you to visualize various elements of the joints without causing radiation exposure to the body.