



DIAGNOSTICS AND SURGICAL TREATMENT OF SPONDILODISCITES OF THE TRESURAL AND LUMBAR SPINE

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Article history:	Abstract:
Received: October 8 th 2021 Accepted: November 8 th 2021 Published: December 14 th 2021	<p>Spondylodiscitis is an infectious inflammatory disease of the vertebrae and intervertebral discs. Its frequency has increased in recent years. With this disease, two main functions of the spine are disrupted: ensuring a stable vertical position of the trunk and protecting the spinal nerve structures. At the same time, the diagnosis of spondylodiscitis is difficult and often occurs with a significant delay after the onset of the first symptoms. This is due to the rare occurrence of the disease. Spondylodiscitis affects children and adolescents during the period of active growth of the spine, as well as adults after the age of 45-50 years.</p> <p>Men get sick almost 2 times more often than women. The disease is most susceptible to patients with chronic endocrine pathology (especially diabetes mellitus), patients with immunodeficiency who have been taking cytostatic and hormonal therapy for a long time, intravenous drug addicts, and patients who have undergone surgery on the spine. There are various classifications of spondylodiscitis.</p>

Keywords: Spondylodiscitis, Hematogenous infection, Chondroblast, Diagnostic, Computer tomography, Treatment.

RELEVANCE.

According to the source of infection, the following are distinguished: primary (arising in the absence of other visible foci of infection); secondary (developing as a result of the introduction of infection from other foci or as a result of injury) lesions. Iatrogenic osteomyelitis of the spine caused by invasive diagnostic or therapeutic procedures. According to the clinical course, acute, subacute and chronic spondylodiscitis are distinguished: the acute process lasts for three weeks; subacute - from three weeks to three months; chronic - over three months. By localization, spondylodiscitis of the cervical, thoracic, lumbar and sacral spine can be distinguished. At the same time, infections of the thoracic and lumbar regions are much more common. Infectious inflammation of the intervertebral disc of the disc can be multiple: in the case of hematogenous infection, adjacent vertebrae are affected. Causes The penetration of bacteria through the circulatory system (hematogenous infection); Post-traumatic infection (this method can include complications after spinal surgery).[1,2,3]

Intervertebral discs do not often suffer from inflammation caused by infection because the cartilage

tissue does not contain blood vessels. The growth of the annulus fibrosus is carried out by the division of non-specialized "chondroblast" cells on the surface of the hyaline layer of the endplates (thin layers between the bone tissues of the vertebrae and the cartilaginous tissues of the MP disc). Then chondroblasts "mature" and differentiate into chondrocytes.[11,12,13] Through the same plates, fluid, glycoproteins, proteoglycans and minerals enter the annulus fibrosus. Dense cells of the tissues of the ring (chondrocytes) are laid in the intercellular substance "matrix", rich in fibrous collagen molecules and amorphous colloidal substance. But the nucleus pulposus consists of a colloidal solution with a high water content, which is a nutrient medium for pathogenic bacteria, isolated from the circulatory system, through which immune cells enter the site of infiltration. The causative agents of spondylodiscitis in most cases are the same pyogenic bacteria that cause the most dangerous lesions of bone tissue (osteomyelitis, tuberculosis): Staphylococcus aureus; Pseudomonas aeruginosa; colibacillus; epidermal staphylococcus; proteas; mycobacterium tuberculosis. Hematogenous infection of the spinal tissue is secondary in nature, because first, the internal organs



of the chest, abdomen and pelvis are attacked by a bacterial attack.[4,6]

According to statistics, the inflammatory process in the center of the intervertebral disc occurs for an inexplicable reason in every third case. Mechanism of development Pathogenic microorganisms penetrate into the central part of the intervertebral disc through the slightest damage to the annulus fibrosus or blood capillaries in the hyaline layer of the endplate. Any violation of the integrity of the matrix can become an "open gate" for pyogenic bacteria attacking chondroblasts and chondrocytes. Proteolytic enzymes secreted by bacteria destroy the protein membrane of cells, which allows microorganisms - "aggressors" to feed on decomposition products or penetrate into the cytoplasm. The inflammatory and destructive process begins with the endplates. [5,7] Then the purulent melt containing live bacteria, lymphocytes, bacteriophages, antigens, antibodies and a mixture of enzymes secreted by dead bacteria and immune cells spreads in the denser tissues of the annulus fibrosus and breaks into the nucleus pulposus in the thinnest place (in the center of the disc). An abscess in the intervertebral space creates an embolus (vesicle) with thinned walls, inside which the increased pressure of the liquid contents causes painful sensations in the spine: the roots of the spinal nerves signal irritation created by the bulging edges of the annulus fibrosus. A purulent mass can cause infection of the external soft tissues of the periosteum and ligaments located in the paravertebral space. Breakthrough of exudates into the spinal canal causes the formation of an epidural abscess, infection of the spinal membranes and compression of the spinal cord.[8,10] Possible consequences: muscle paresis, dysfunction of internal organs, impaired motor function. The melting of the cartilaginous tissues of the intervertebral disc does not remain only within the intervertebral space: an active bactericidal attack of the immune system can damage the bone tissues of the vertebral bodies. Osteolytic enzymes secreted by some types of pyogenic bacteria and bacteriophages destroy the surface layers of osteocytes. Erosion and demineralization of bone tissues adjacent to the endplates begin. This may become a prerequisite for a deeper infection of the vertebral bodies.[9,10,11]

Abscess resorption after the cessation of the immune response becomes the first phase of the recovery process. Connective tissue cells replace the damaged cartilaginous layer, which does not restore the intervertebral disc. Conversely, the weaker connective tissue wears out. Symptoms of fever (mostly to the

level of subfebrile, 37.5-38.2o); lack of appetite, weight loss; physical weakness, lethargy; headache.

The onset of the disease, as a rule, goes unnoticed, and constant back pain, which intensifies at night, when walking, and growing signs of general intoxication, becomes an alarm signal. This condition can last in different ways: from 10 days to one month, depending on the severity of the process. The most common symptom of spondylodiscitis is back pain, but some patients may not feel pain. Pain syndrome is expressed in dull pulling pains with attacks when turning and bending. Pain syndrome depends on the localization and prevalence of the pathological process in the spine. The most common localization of pain and, accordingly, lesions is in the lumbar spine, less often in the thoracic and very rarely in the cervical. Pain in the thoracic spine may resemble pneumonia or pleurisy, in the lower thoracic and lumbar spine they mimic an acute abdomen, dynamic obstruction, paranephritis, osteochondrosis. This leads to misdiagnosis or even unnecessary surgery. Fever is a less common symptom that occurs in about half of patients. The least common fever occurs with spondylodiscitis of tuberculous etiology. The spread of the infectious process to the spinal canal is accompanied by the development of a radicular syndrome with limited motor activity, signs of irritation or extinction of reflexes, impaired sensitivity in the areas of the affected roots. With the progression of the disease, signs of spinal cord compression may appear: the development of paresis of the extremities with an increase in neurological deficit to plegia, dysfunction of the pelvic organs with delayed urination and defecation.

Spinal deformity in the form of kyphosis is more common in tuberculous lesions. Spondylodiscitis of the cervical spine may manifest as dysphagia or torticollis. Inflammation of soft tissues in the paravertebral region is determined by swelling and increased blood circulation in the affected area. Spasms of deep muscles connecting the transverse processes distort posture and restrict movement of the affected spine.

Prolonged spasm and dorsomyalgia (painful sensations in the muscles of the back) lead to impaired blood circulation, from which dystrophy of muscle fibers begins. **Diagnostics** Examination of the soft tissues of the spine using radiography gives ambiguous results: it is not possible to clearly distinguish violations of the integrity of the intervertebral discs. Purulent fusion and the formation of abscesses can only be determined by blurring the contours of the endplates and distorting the outlines of the vertebral bodies. Computed tomography makes the image more visual,



presenting it as a three-dimensional figure on the monitor screen, and allows you to more accurately estimate the size of the abscess.[13]

Treatment The goal of spondylodiscitis treatment is to eliminate the pathogen, restore and preserve spinal function, level neurological deficits, and relieve pain. Conservative treatment is indicated in the absence of destruction foci and signs of spinal cord compression on CT and MRI. It currently includes antibacterial, immunocorrective, detoxification therapy, physiotherapy and immobilization.

Surgical treatment - operation The goals of surgical intervention are the elimination of the infectious focus, taking a biopsy for microbiological and histological examination, decompression of the spinal canal with stabilization and restoration of damaged spinal structures. Drainage of internal multi-chambered abscesses (inside the spinal canal) takes longer because it is required to create access through soft or bone tissue.[7]

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