

Treatment of Pain Syndrome in Osteochondrosis of the Lumbar Region and Radiculitis through Reflex Therapy

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ABSTRACT

Herniated intervertebral disc with lumbar osteochondrosis is diagnosed among 62.9% of patients and is the most prevalent disease of the lumbosacral spine. In 86% of observation the lumbar diskogenic radiculitis conflict is the cause of lumbosacral pain. Removal of herniated intervertebral discs at the lumbar level is the most frequently performed and planned operation in all neurosurgical hospitals in our country and abroad. During the many years, the microdiscectomy was the optimal method of treatment of the discogenic radiculitis and assumed as a the concept of the "Gold standard". However, popularization of the endoscopic and puncture techniques in the surgery of herniated intervertebral discs force specialists to reconsider this concept. Currently, endoscopic discectomy performed through mechanical removal of herniated disc, laser vapolirization, chemonucleolysis, vacuum extraction, radio frequency intradiscal therapy and their various combinations.

KEY WORDS: herniated intervertebral disc, degenerative changes, lumbar osteochondrosis, computed tomography and magnetic resonance imaging.

In the general structure of diseases of the peripheral nervous system, lumbosacral radiculitis is more than 80% of the number of cases and up to 90% - by the number of days of disability [7].

Various problems of osteochondrosis of the lumbar spine - etiology, pathogenesis, clinical picture, diagnosis and treatment - are so important that they are comprehensively covered in numerous domestic monographs [1].

Herniated disc in patients with lumbar osteochondrosis is diagnosed in 62.9% and is the most common disease of the lumbosacral spine. In 86% of cases of disc-radicular conflict [6, 15].

Removal of herniated discs at the lumbar level is the most frequently performed elective surgery in all neurosurgical hospitals in our country and abroad in general. For example, the number of lumbar interlaminar discectomies in the United States reaches 250 thousand annually, and at least 800 thousand lumbar discectomies are performed in the world every year [4].

Up to 10% of patients from the total number of those suffering from lumbar osteochondrosis become disabled, and among the operated patients the general level of disability is 70.3%. Even after microdiscectomies, no more than 61% of those operated can return to their previous work [10].

In recent years, there has been an increase in persistent disability, especially due to pathological conditions, united by the term "diseases of civilization". Among them, one of the leading places is occupied by lumbar osteochondrosis, which takes 3rd place in the structure of primary disability in diseases of the nervous system [9].

It is known that patients with lumbar osteochondrosis are most often people of working age. Therefore, the economic and moral losses due to persistent disability in this disease are very high [2]. This explains the interest in issues related to persistent disability due to lumbar osteochondrosis. However, at present there is no official statistics on the general contingent of persons with disabilities with this disease, which makes it difficult to plan adequate measures for prevention, treatment and rehabilitation. At the same time, according to modern concepts, medical and social expertise is a set of measures to determine the needs of the examined person in measures of social protection, including rehabilitation [5].

The neurological symptoms arising in discogenic radiculitis and, above all, pain syndrome are caused by the following main pathogenetic mechanisms or their combination:

- 1) pressure on nerve structures (spinal cord, spinal nerve root), herniated intervertebral disc, scar tissue, bone growths with impaired blood circulation in these structures;
- 2) irritation of the receptors of the posterior longitudinal ligament, innervated by the meningeal branch of the spinal nerve;
- 3) instability of the spinal motion segment - vertebral listesis;
- 4) reactive cicatricial adhesions and autoimmune inflammatory processes.

The anatomical formations of the spinal canal (spinal cord, its nerves and their roots, intervertebral discs, etc.), various variants of the arterial and venous circulation of the spinal cord have been studied quite well and their features are of decisive importance in the occurrence of clinical manifestations of lumbar osteochondrosis [7].

A radical change in understanding the causes of the clinical manifestations of lumbar osteochondrosis occurred in the 40-50s of the 20th century, when the concept of the leading role of intervertebral disc damage in this pathology became widespread. The problem of degenerative lesions of the spine has become one of the leading problems in clinical neurology, neurosurgery and orthopedics.

The process of degeneration of the intervertebral disc is characterized by complex biochemical changes. Under the influence of mechanical and other factors, the nucleus pulposus, consisting of polysaccharides, hyaluronic acid and proteins, is depolymerized and therefore loses its compactness and hydrophilicity. Consequently, osteochondrosis of the spine manifests itself in the drying of the nucleus pulposus of the disc, which leads to cracks in its annulus fibrosus and the subsequent movement of the pulp of the nucleus into these cracks, and sometimes through them and outside the disc. The rich innervation of the intervertebral discs and the ligaments adjacent to them, as well as the proximity of the discs to the nerve and vascular formations located in the spinal canal, with osteochondrosis, can often lead to pain and various reflex disorders, as well as to dysfunction of the spinal cord and its nerves.

Several theories have been proposed to explain the development of changes in the intervertebral disc: involuntional, hormonal, vascular, infectious, infectious-allergic, bioelectret, mechanical, abnormal, functional and hereditary. None of them can claim to be comprehensive. Recently, a rather interesting theory has been put forward about the multifactorial nature of spinal osteochondrosis. According to this theory, for the development of this disease, a genetic predisposition is necessary, and for its manifestation, the influence of various environmental factors. Environmental factors are divided into endogenous and exogenous. Endogenous includes constitutional variants, anomalies of the spine, features of the functioning of the motor system, concomitant diseases of the spine and other organs, and exogenous - physical and biochemical factors [1].

A seventy-year history of surgical treatment of compression forms of lumbar osteochondrosis began in 1934, when a neurosurgeon and orthopedist proposed the use of laminectomy for the treatment of discogenic vertebrogenic radiculitis [18, 31]. They described in detail the clinic of lesions of the lumbar intervertebral discs and for the first time proposed the term "herniated intervertebral disc" - rupture of intervertebral disc .

In subsequent publications, it should be noted, first of all, a significant increase in the number of operations performed. In addition, the stages of herniated intervertebral discs were identified, among which protrusions (protrusion of the nucleus pulposus with intact annulus fibrosus) and protrusions (when the nucleus pulposus falls out through the annulus fibrosus defect) were identified. Often, the diagnosis of bulging of the nucleus pulposus or prolapse of a herniated disc was not confirmed during the operation, and the frequency of such cases in those years was significant - from 20.5% to 46.9% [4].

Additional studies were required to explain the causes of acute and chronic pain in the spine, trunk and extremities, which do not fit in their manifestations into the picture of the lesion of the spinal nerve root. Works on myofascial pain syndromes were of great importance here [3].

The study of the pain phenomenon presents certain difficulties, while one of the main problems is the complexity of an objective analysis of the algic phenomenon. Attempts to objectify pain using various

methods have been made repeatedly. Registration of changes in vascular tone, blood filling of vessels, bioelectrical activity of the brain, electromyographic and thermographic parameters, analysis of the content of monoamines and endorphins in blood and cerebrospinal fluid and other studies only indicate that the detected neurophysiological, humoral and vasomotor changes are associated with pain [5].

Most of the developed methods used to study pain in general medical practice are based on the subjective assessment of the subjects, that is, on the feelings of the patient himself. These are mainly psychological and psychophysiological tests: a visual analogue scale, digital scales, a method of descriptive definitions of pain, a complex pain questionnaire, keeping diaries and a quality of life questionnaire [11].

With the accumulation of facts, it was found that, in addition to degenerative changes in the intervertebral discs, there are other vertebrogenic factors that cause the appearance of various neurological symptoms. It turned out that in some cases the narrowing of the lumbar spinal canal can be the cause of radicular and other neurological symptoms.

From a pathophysiological point of view, the following points are important in the occurrence of lumbar pain: emotional factors, changes in muscles, as well as changes in the facet joints and intervertebral discs. Pathomorphological changes in the joints, beginning with synovitis and hypomobility, cause, with further degeneration, subluxation and proliferation of articular processes. Pathomorphological changes in the intervertebral discs, starting with peripheral and radial fissures, lead to ruptures and displacements of the disc, followed by the appearance of osteophytes, the interaction of the arising changes in the facet joints and intervertebral discs - to hernial protrusion, instability, involvement of the spinal nerve roots and, ultimately, to single or multilevel stenosis .

The significant pathogenetic role of spinal canal stenosis in the development of compression of the cauda equina and spinal nerve roots has been convincingly shown in numerous works [13].

Spinal canal stenosis can be congenital or acquired. The latter is subdivided into degenerative (central, lateral, or their combination), combined (with herniated intervertebral disc, congenital progressive stenosis, or a combination thereof), after laminectomy (cicatricial adhesions), after corporodesis (below or above its level) as well as after trauma (early or late changes) [5].

Many authors consider it necessary to isolate the stenosis of the spinal canal and the lateral zone. They emphasize that acquired stenosis of the lumbar canal can be caused by degenerative changes with and without spondylolisthesis, and a combination of congenital and acquired lumbar stenosis of the spinal canal is also possible. Stenosis of the lateral zone can be in the form of one- and two-sided stenosis of the subarticular zone, one and two-sided foraminal stenosis, or a combination of subarticular and foraminal stenosis .

Clinically, stenosis of the lumbar spinal canal is initially manifested by lumbar pain and at this stage is usually diagnosed as lumbar-cranial radiculitis. The most typical radicular stage is characterized by the syndrome of neurological intermittent claudication. At this stage, while walking, patients develop pain, paresthesia in the lower extremities, which force the patient to stop [8].

X-ray examination is of great importance for the diagnosis of narrowing of the spinal canal. At the lumbar level, the spinal canal is considered narrow if its anteroposterior diameter is less than 13–15 mm, and its transverse diameter is less than 18–20 mm [13].

Analysis of social and labor rehabilitation showed that stenosis of the lumbar spinal canal significantly reduces the possibilities of surgical treatment, since only 38.3% of patients who had it were fully restored to work capacity after surgery, and 18.4% of people remained disabled [6].

When studying the long-term results of surgical treatment of herniated lumbar intervertebral discs, the dependence of the outcomes on the sagittal dimensions of the spinal canal was revealed. With spinal canal sizes over 13 mm, excellent and good results were obtained in 61.4% of patients, while in the group of patients with a narrow spinal canal, such results were observed only in 43.3% of cases [7].

To date, it has been established that lumbosacral vertebral pain syndrome can be induced by various pathogenetic factors: herniated intervertebral disc, functional blockages of the joints of the spine, foci of neuromyosteofibrosis, arterial discirculation, non-hernial root compression, venous otomatosis, impaired - vertebral pathology, spinal instability, autoimmune inflammation, reactive aseptic spinal epiduritis, spinal arachnoiditis and spondyloarthrosis [10].

Over the past two decades, visualization of the pathological process in the spinal canal has become possible due to the introduction of such non-invasive examination methods as computed tomography and magnetic resonance imaging into wide neurosurgical practice [12].

MRI is an invaluable diagnostic tool for CT examination of the lumbar spine; however, in unoperated patients, CT is still the method of choice due to the excellent image of bone structures and soft tissues and its lower cost compared to MRI [8].

However, MRI diagnostics of herniated intervertebral discs avoids radiation exposure, does not require additional contrasting, the sagittal plane makes it possible to immediately cover a greater length of the spinal column. Special studies comparing the accuracy of MRI and CT in detecting herniated lumbar intervertebral discs showed the best results of the first method [11].

MRI demonstrates not only disc protrusion, but also degenerative changes in the ligamentous apparatus and facet joints [3].

Among the disadvantages of MRI, one can note, firstly, the likelihood of displacement of metal implants (this applies mainly to hemostatic clips in the brain), secondly, the action of the radio frequency field in the presence of an artificial heart rate driver can cause interruptions and, thirdly, , the occurrence of pronounced artifacts from paramagnetic metals.

In addition to native CT, a study with contrasting CSF spaces is used - CT myelography, which provides information about the nature of the deformation of the dural sac at the pathological level, and contrasting of intervertebral discs - CT discography [8].

For degenerative lesions of the lumbosacral spine, MRI should be used in all cases. In spondylolisthesis, it is imperative to perform spondylograms and functional spondylograms, which should also be performed in case of signs of instability of the affected segment. For spinal stenosis, the authors recommend the use of CT myelography, which, in contrast to MRI, more accurately identifies the sites of bone compression .

The most widespread are posterior decompression surgeries, the main trend of improvement of which consisted in reducing the trauma of the access and maximizing the preservation of the bone structures of the spine up to interlaminectomy - removal of the hernia by the interrectal method. This approach, with some modification due to partial resection of the edge of the superior or inferior arch of the vertebra, was used most often [9]. Until now, a pathogenetically substantiated system of neurosurgical treatment of patients with chronic discogenic pain syndromes of lumbar osteochondrosis has not been created. The main reason for this is the insufficient development of differentiated indications for surgical interventions, taking into account the clinical, radiological, CT and MRI characteristics of pathogenetic situations in the focus of the disease with various types of lesions of the intervertebral discs. Solving this issue will reduce the frequency of relapses of pain syndromes and develop ways to prevent them. The questions posed, caused by the search for ways to improve the results of surgical treatment of neurological manifestations of lumbar osteochondrosis, served as the basis for this study.

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