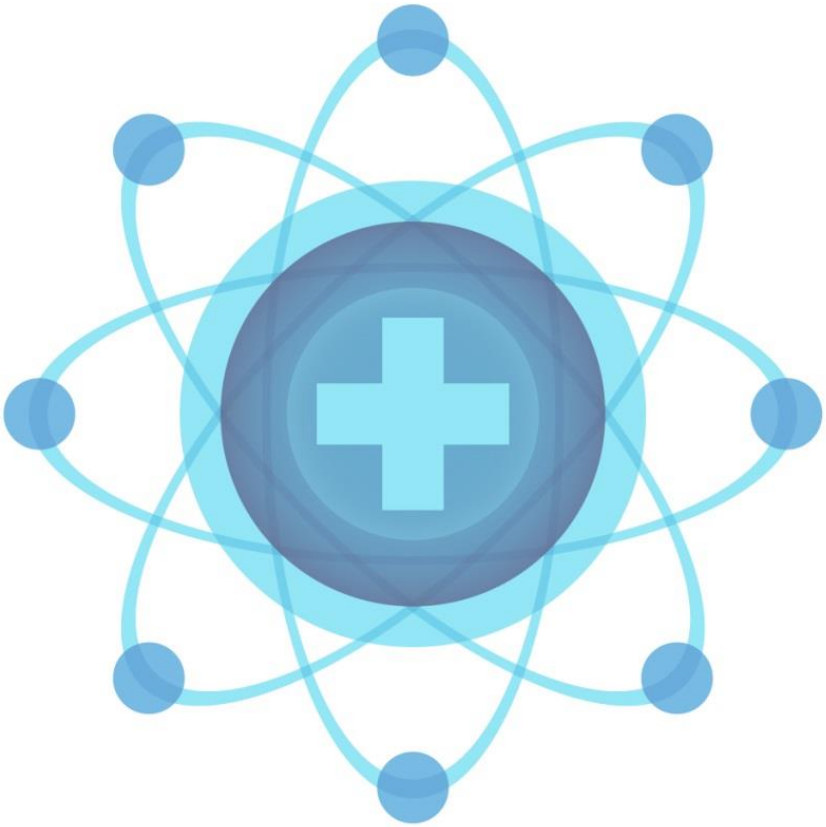

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Prediction of pain syndrome in the postoperative period for a herniated disc.

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Relevance. Degenerative-dystrophic diseases of the spine are chronic diseases, often leading to limited activity in people of working age. In the modern world, this pathology is the most common disease affecting up to 90–97% of the adult population [4, 10]. According to a number of researchers, up to 90% of radiculopathies are caused by herniated intervertebral discs (HMPD) [5,17]. Therefore, one of the most significant manifestations of the degeneration process is the formation of a herniated disc, and in more than 80% of cases the pathology is detected in the lumbar region [3,9]. In our country, degenerative diseases of the spine account for up to 76% of all cases and 72% of days of temporary disability in the outpatient network, and in neurological hospitals 56% and 48%, respectively [8,11]. As a rule, patients suffering from back pain are actively working people [2, 14]. A significant duration of the disease, clinical manifestations in the form of the inability to work, move independently, serve oneself, the low efficiency of existing methods of treatment - all this leads to enormous costs for the treatment of this pathology [12, 16]. The chronic, recurrent nature of the course of HMPD, often leading to disability of patients, as well as the increase in the frequency and "rejuvenation" of this pathology observed throughout the world, puts the solution of the problems of choosing a treatment method and increasing its effectiveness to the forefront of medical science and practice [1, 15]. Conservative methods of treating this disease are mainly reduced to symptomatic treatment, physiotherapy and/or manual therapy, and a significant proportion of patients (19%) require surgical treatment after 1-3 months due to the ineffectiveness of conservative treatment [6, 18]. The frequency of hospitalization of patients with HMPD for surgical treatment over the past 10 years has tripled and continues to grow steadily [13]. Every year, 50% of operations in neurosurgical hospitals are performed on patients with discogenic pathology [20]. With the increase in the number of surgical interventions, the number of patients for whom the operation did not bring relief from pain and even increased the existing clinical symptoms is also growing. Severe clinical manifestations of these diseases in 70% of cases lead to temporary disability, and a significant proportion of patients become disabled [7, 19].

The purpose of the study . To assess the possibility of predicting pain in the postoperative period for herniated discs.

Materials and research methods . The study protocol consisted of:

1. General clinical examination.
2. The study of neurological symptoms according to the method of standard neurological assessment.
3. Functional spondylography .
4. Assessment of the state of the spine, spinal cord and its roots using MRI with possible contrast enhancement.
5. Assessment of the degree of degeneration of the lumbar intervertebral discs.

The issues of differential diagnosis of herniated intervertebral discs with a number of diseases are considered. The methods used in the course of our study are presented, in particular, physical and laboratory research methods, radiation research methods, including spondylography , X-ray computed tomography, and magnetic resonance imaging. Classifications of degenerative-dystrophic changes in the lumbar spine are given on the basis of magnetic resonance imaging data.

Research results . The main study included an analysis of 172 cases of recurrent herniated discs. The majority of patients with recurrent disc herniations in the time interval 2020-2022. were men (59.3%). In the study of the social status of patients, we found that the majority of patients (51.2%) were employed. For other social groups, the composition was approximately the same and amounted to 13.4% for disabled people of group II, 12.7% for pensioners, 11.6% for the unemployed, and 11.1% for disabled people of group III.

Next, we analyzed the distribution of patients according to the level of recurrence of herniated intervertebral discs. We identified an additional level of L5L6, which is associated with a rather rare anomaly in the development of the lumbar spine - lumbarization of the first sacral vertebra and exposure of the L5L6 disc. Since the number of patients with the presence of the L5L6 level turned out to be insignificant, recurrences of herniated discs at this level were included in the group of relapses at the L5S1 level. When distributing patients according to the level of occurrence of recurrence of herniated discs, the vast majority of relapses were at the level of IA-L5 and L5-S1 (89%). Thus, the level L4-L5 accounted for 49.5%, and the level L5-S1 35.5% of the total number of relapses. The smallest number of relapses was recorded at the level of L2-L3 - 1.7% of the total number of relapses. When analyzing the time interval in which a relapse occurred, we found that the highest number of relapses was the time interval of 4 years after surgery. It accounted for 22% of the total number of relapses. A fairly large percentage were relapses that occurred in the time interval of 5 years or more. However, if we combine the time intervals into groups up to 1 year, 1-3 years, 4-6 years and more than 7 years, we will see that the majority of relapses occur in the time interval of 1-3 years 37% .

When studying the distribution of patients by age groups, we noted that the majority of patients were in the age range from 30 to 49 years and amounted to 76.9% (patients in the age range of 30-39 years - 40.4% and patients aged 40-49 years 36.5%. The smallest group consisted of young patients aged 20-29 years - 14.53% of the number of patients examined for the period 2020-2022.

Thus, the majority of cases were patients who underwent primary extended interlaminectomy - 62% of the total number of patients. In most cases, the reoperation was also reduced to an extended interlaminectomy - 53%. Next, we conducted a retrospective analysis to determine the possibility of using magnetic resonance imaging of the lumbosacral spine to predict hernia recurrence. We observed 112 patients aged 21 to 62 years (mean age 42.87 ± 3.63 years). During the specified time, in addition to the routine clinical examination, these patients underwent magnetic resonance imaging to monitor the condition of the operated spine. In the first year after surgery, MRI was performed after 3, 6, 12 months, then once a year.

MPT was performed using fast (FSE) spin - echo pulsed studies and gradient echo (GRE) mode and obtaining T1-WI and T2-WI in the sagittal and axial planes on Obraz-2 devices (0.14 T) and on « Expert Vision Siemens " (ITl). At the first discectomy , preoperative MRI data were fully confirmed, according to which 60% of patients (n=67) had herniated L3-L4 (n=9) and L4-L5 (n=58) discs, and the remaining 40% (n=58) =45) had herniated disc L5-S1. In 65% of patients (n=73) during the entire follow-up period of seven years, we did not observe significant motor, trophic, reflex and sensory disorders. However, in 11% of patients, MRI revealed a hernia recurrence. In total, repeated discectomy was performed in 39 patients, 8 of whom were excluded from the study, since, as mentioned earlier, we did not classify heterolateral hernias that gave radicular syndrome on the other side or another disc as relapses. In 8 patients with recurrent HMPD, but without severe neurological symptoms, repeated discectomy was not performed, they were followed up dynamically. In them, as well as in 23 other patients (in whom HMPD recurrence was accompanied by progressive radicular syndrome), contrast-enhanced MRI was performed to differentiate between relapse and epidural fibrosis.

When assessing degenerative changes in the discs, a classification was carried out according to the degrees proposed by Pfirrmann et al . (2001). According to this classification, 74% of patients (n=23) had mild or moderate signs of degenerative changes in prolapsing discs. While grades IV and V (disc collapse) were observed only in 26% of patients (n=8). We performed a preoperative determination of the HMPD value and its percentage ratio with the sagittal size of the spinal canal, however, there was no statistically significant difference between these two indicators in both groups. The data obtained during the study showed that true relapses of HMPD occur much more often (32%) than indicated in the literature, but are not always accompanied by severe neurological symptoms. It has also been established that only mild and moderately pronounced degenerative changes (I-III stage) of prolapsed discs, and not the size of their hernias, are the determining factors for the occurrence of a recurrence of the latter. The probability of HMPD recurrence in patients with MR tomographic signs of degenerative changes in the intervertebral disc of 1-3 degrees is three times higher than in those whose discs have pronounced (IV and V stages) degenerative changes. The obtained results of the “maturity” of the GMPD were used in the development of the preoperative planning algorithm.

Conclusions: The evaluation of magnetic resonance imaging data in patients with herniated discs of the lumbar spine was carried out with the selection of the most informative morphological features. The used classifications of the degree of "maturity" of HMPD and degenerative changes in the discs made it possible to develop an algorithm for preoperative planning of the volume of surgical intervention for herniated discs.

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