

Innovations in Differential Diagnosis of Dystrophic-Degenerative Diseases of Vertebral Column

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Abstract

Data of paraclinical research (conventional roentgenography, CT, MRI, CT + myelography) of 98 patients with the dystrophic-degenerative diseases of vertebral column's lumbar region revealed the main reasons of back pain syndrome: the herniation of intervertebral discs (52 patients), spinal stenosis + osteofits (25 patients), spinal stenosis + ligamental hypertrophy and annulus fibrosus (21 patients). Neuroimaging complex investigation is out of discussion when spinal cord's and vertebral column's different regions are damaged simultaneously by morphologically different pathology, because in such cases the decision has to be made between conservative treatment or surgery.

Keywords: *low back pain, dystrophic-degenerative diseases, intervertebral disc herniation*

Introduction

Despite of centuries, the problem of low back pain is still of great interest for clinical neurology. Physicians are disenchanted by frequently obscure etiology of this irksome pathology and the commonly disappointing response to treatment. Today, when we compare the benefits of CT and MRI with what plain X-ray and myelography offer to the clinician, we had entered a new era of neuroimaging technologies for verification of vertebral column's dystrophic-degenerative diseases.

Formulating diagnostic and treatment conditions for dystrophic-degenerative diseases of vertebral column involves the following aims:

- to establish differential-diagnostic criteria's for dystrophic-degenerative diseases of vertebral column;
- to verify clinical diagnosis by emphasizing morphologic features of intervertebral discs, roots

and vertebral joints in lumbar region of vertebral column;

- to measure the neuroimaging criteria's for various clinical forms of chronic low back pain syndrome;
- to realize the correlation of clinical and neuroimaging criteria's for prognosis of disease and in every concrete case to organize the adequate treatment.

Materials and Methods

To solve the above raised problems, the investigation was carried out on 150 patients with chronic vertebral pain in Neurology department of Tbilisi State Medical University in 1999-2002. Paraclinical research (conventional roentgenography, CT, MRI, CT+ myelography) revealed dystrophic-degenerative disease of vertebral column's lumbar region in 98 cases. The age of patients was 30-65 years (55 males and 43 females).

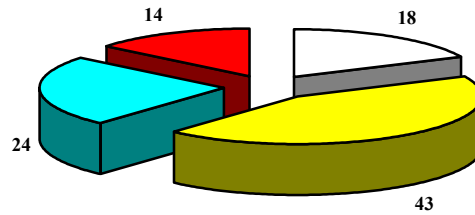


Fig.1 The clinical groups of observed patients.

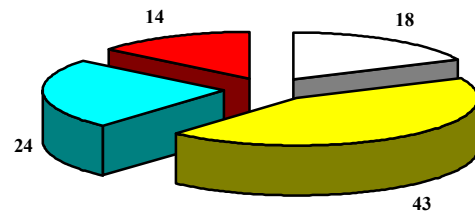


Fig.2 Groups of patients according to morphologic abnormalities of intervertebral discs.

According to clinical symptoms the patients were divided into 4 groups (Fig. 1):

- 18 patients with low back pain without irradiation of the pain in the limbs and senso-motoric deficit;
- 43 patients with severe low back pain and irradiation of the pain in the limb; with hyperreflexy and motor deficit in affected extremity;
- 24 patients with severe pain syndrome, paravertebral contraction, senso-motoric disorders and torpid reflexes;
- 14 patients with compression syndrome and emphasizing senso-motoric deficit; areflexia and muscle hypotony; with lose control of bladder and rectum functions.

- the herniation of intervertebral discs (medial or lateral) - 52 patients;
- spinal stenosis + osteofits (25 patients);
- spinal stenosis + ligamental hypertrophy and annulus fibrosus (21 patients).

The 52 patients with the herniation of the intervertebral disc, topographically were divided to the following categories: a) intervertebtal disc L3-L4 -17 patients (32.6%); prolapsis 10 patients and protrusion 7 patients; b) intervertebral disc L4-L5 - 23 patients (44.2%); prolapsis 15 patients and protrusion 8 patients; c) intervertebral disc L5-S1 - 10 patients (23.2%); prolapsis 7 patients and protrusion 3 patients. In cases of spinal stenosis the radicular-compression syndrome were presented as a rule: in 90% it was caused by spondyloarthrosis and in 10% - by spondylolisthesis.

Results and Discussion

The neuroimaging data revealed that main reasons of dystrophic-degenerative diseases of vertebral columns of lumbar region are:

The morphologic abnormalities of the intervertebral discs were in direct correlation chain with pathologic process and severity of the disease (scheme 2): 1. The lumbar segment's instability associated with the "simple" rupture of annulus fibrosus (16.9%); 2. The "total" prolapsis of the intervertebral disc (4.9%); 3. "Elastic"

prolapse of the intervertebral disc (13.2%); 4. The lumbar segment's instability after the prolapse of intervertebral disc (23.5%); 5. The lumbar segment's instability after the protrusion of the intervertebral disc (11.3%); 6. The lumbar disc sequestration after the prolapse (10.9%); 7. The partial protrusion of lumbar disc (19.3%).

Conclusions

The analysis of our data showed that radiological investigation has no alternative, but each method is specific for the diagnostic of dystrophic-degenerative diseases of vertebral column:

- Spondylography fixed the vertebral measures, spondylolisthesis and osteofits, that significantly enriched neuroimaging trials;

- Spiral CT are characterized by short-time scanning (few minutes), multi-plan and three measured reconstruction ability;
- MRI is the "gold standard" in diagnostics of spinal processes (intramedular or extramedular), as well as verification of the dystrophic-degenerative diseases of the vertebral column (pathology of the vertebrae, intervertebral discs, ligamental and annulus damages and etc.);
- CT + myelography is necessary in cases of spinal stenosis when surgical operation is mandatory
- Neuroimaging complex investigation is out of discussion when spiral cord's and vertebral column's different regions are damaged simultaneously by morphologically different pathology, because in such cases the decision has to be made between conservative treatment or surgery.

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Новации в дифференциальной диагностике дегенеративно-дистрофических заболеваний позвоночника

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РЕЗЮМЕ

На основе данных параклинического обследования (КТ, МРТ, рентгенография позвоночника, КТ+миелография) 150 больных с алгическими синдромами разработаны нейровизуальные диагностические критерии дегенеративно-дистрофических заболеваний позвоночника. Анализ полученных данных свидетельствует о том, что нейровизуальное обследование данной категории больных не имеет альтернативы в сравнении с другими методами исследования. Полученные результаты позволяют выбрать адекватное лечение больных (консервативное или хирургическое) даже в том случае, когда на различных уровнях позвоночника выявляются морфологически различные патологические процессы.

Ключевые слова: *поясничные боли, дегенеративно-дистрофические заболевания позвоночника, грыжа межпозвоночного диска*