

THE EFFECT OF CONSERVATIVE MANAGEMENT OF LUMBAR DISC HERNIATION IN ADOLESCENT: A CASE REPORT

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Abstract. Medical practice reveals only few cases of disc disorders in children, but they become frequent when dealing with active teenagers. We present the case of a 16 year-old-girl with low back pain and right sided sciatica persisting for one month and scoliosis. She had previous history of trauma. MRI showed L4-L5 and L5-S1 disc herniation and no further bone and structural changes. A decision to use conservative treatment was unanimously agreed upon by a team of orthopedists and a neurosurgeon an internist. The conservative treatment consisted in exercises therapy associated with therapeutic modalities for pain and inflammation management, completed by the patient 4-5 times per week. Following the application of the conservative treatment, the patient has registered a favorable evolution achieving improvements in spine mobility and muscle deficit, indicating the absence of low back pain with a decreased level of antalgic scoliosis, as well as the absence of neurometameric distribution at the level of the right lower limb. This report follows the patient's course from the onset of pain through the completion of the nonoperative treatment and shows that HNP of a lumbar intervertebral disk with radiculopathy can be treated successfully with aggressive nonoperative care.

Keywords: *lumbar disc herniation, low back pain, scoliosis, adolescence.*

Introduction

The lumbosciatic syndrome represents an evergreen issue registering a great frequency, generating an increased work disability. The trouble of assessing a precise diagnosis method based on causality due to the lack of a unitary and interdisciplinary systematic approach determines the inconstancy of an adequate complex therapy which leads to socio-economic repercussions in all countries.

Disc herniation represents a discoradicular conflict causing significant intrarachidian repercussions consisting in L4-L5 or L5-S1 intervertebral disc herniation[1]. Disc herniation put pressure against the vertebral ligament which may cause rachidian pain and reflex muscle contracture. Disc herniation leads to two types of main manifestations – vertebral (rachidian) and radicular, and other auxiliary manifestations (dural, musculofascial, neuropsychic)[2].

The age interval indicating a maximum frequency ranges between 30-45 years, and the ration man/woman indicates a value of 2/1. Usually unique, 70% of the herniation cases appear in persons submitted to increased physical efforts. In 95-98% of the cases, herniation is located in the lumbar area, 50% of them are L4 herniations and 40% L5 herniations[3]. Medical practice reveals only few cases of disc disorders in children, but they become frequent when dealing with active teenagers. Less than 3% of the total number of patients diagnosed with disc herniation needing surgical intervention refers to persons under 18 years old; most of them being teenagers. Similarly to the adult cases, in teenagers disc herniation

appears more frequently at the level of L4-L5 or L5-S1 intervertebral discs.

Typical discogenic pain which originates from a herniated disc is characteristic for adolescent patients with herniated lumbar discs (HLD). The pain is mostly related to the back trauma and most of the times is combined with a degenerative process and a bony spur such as posterior Schmorl's node[4]. Children and adolescents with lumbar disc herniation complain about not being able to flexion the anterior trunk, having scoliosis and difficulties in walking. The most common symptom is the lumbar pain and the most common signs are the limittaion of lumbar motility and Lasague.

Although the clinical significance and the pathophysiology are not very well known, there has always been an association between the scoliosis and lumbar disc herniation. Children spine has always had a better adaptive capacity and this helps in protecting the nervous tissue. For instance, for patients with root compression who have scoliosis, when they bend to the side contrary to the compression, it is caused an enlargement of the affected foramen and therefore, the root release. Matsui and collaborators observed that 80% of the patients with disc herniation and scoliosis had the convexity on the side of the root compression[5].

Case presentation

A case is presented to illustrate clinical presentation, radiological assessment and conservative management of lumbar disc herniation in adolescents.

The subject submitted to the study is VS teenage-girl, aged 16, diagnosed with L4-L5 subligamentous and extraligamentous disc herniation with presence of right foraminal approach, uncompensated subligamentous disc protrusion associated with changes of vertebral statics of scoliosis type. Plain X-rays showed a thoraco-lumbar scoliosis with left convexity.

After 1 month from being diagnosed by means of MRI, period in which she had followed a treatment including drug therapy (Lyrica, twice a day; Mydocalm once a day) associated with physical training, she consulted the specialist. The rehabilitation process took place within Sf. Maria Rehabilitation Center, Craiova.

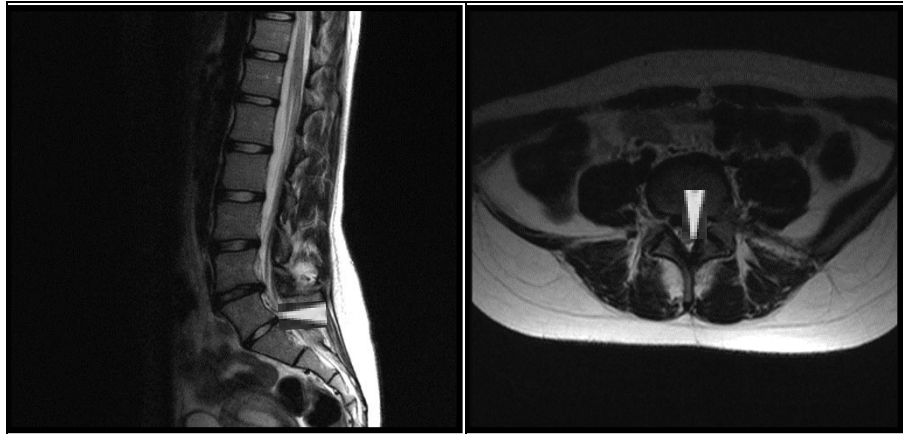


Fig. 1 Lumbar spine MRI

The anamnesis revealed the presence of a low back pain with neurometameric distribution at the level of the right lower limb (posterior part of the buttock, the posterolateral side of the hip, popliteal fossa, lateral side of the calf, dorsal aspect of the plant towards the hallux, and plantar arch pain). Painful scoliosis was also detected. The gait was performed with difficulty because of the lumbar pains with diffuse radiation to the right leg. The back pain increases when sitting and reduces when standing.

The physical examination has included testing the mobility of the lumbar spine (specific mobility tests – Schöber test, test indices fingertip-to-floor, chest-to-wall, lateral bending) muscle testing and elongation– Lasègue and piriformis stretch tests – Piriformis stretch test (4cm, with pain generation, on the left side and 21cm on the right side).

Lasègue sign (20°) was present. The neurological examination reveals no deficiencies in sensory, motor or reflex innervation.

In order to assess painful intensity, the visual analogue scale (VAS) has been used. By means of this instrument, patient has performed a self assessment considering pain intensity on a scale between 0 and 10 (0 = no pain, 10 = maximum pain). For estimating the functional status, the Low-Back-Pain Scale (LBP) has been applied, based on the investigation of 10 parameters given by the professional activity, recreational activities, physical activity restriction, bad posture, irritability, depression, pain (its presence), pain

intensity, family issues and sleep. Its values vary between 0 meaning minimum functional status and 30 – optimum functional status[6].

For the analysis of lumbar pain and of the injury impact on functionality and daily activities, Oswestry questionnaire has been used. The evaluation by means of the Oswestry test is focused on pain and functionality, and is highly oriented on daily activity and all its aspects. Concerned activities include: personal care (dressing, washing, applying makeup/shaving), weight lifting, walking ability, sitting position, orthostatism, sleep, sexual life, social life and professional activity[7].

Conservative treatment

Conservative modalities include appropriate periods of rest and activity modification, nonsteroidal anti-inflammatory drugs, therapeutic modalities for pain and inflammation management such as heat/cold, therapeutic ultrasound and electrical stimulation, exercises therapy, improving biomechanics and patient education. The treatment was performed 4-5 days per week. The exercises therapy has been focused on: pain relief, achieving normal joint mobility and soft tissue flexibility, establishing an effective exercises regimen to achieve a maximum level of functionality for the patient. These objectives were attained through: antalgic postures, manual therapy to increase joint mobility and reduce muscle spasms, muscle stretching particularly for the lumbar extensors gluteal and hamstring

muscles, stabilizing pelvic floor muscles, strengthening lower back, abdominal and hip muscles. The dynamic techniques, which act simultaneously on both pathophysiological links of this disease: muscular contracture and range of motion restrictions, was de basis for the rehabilitation program applied to the studied patient

During the first 7-10 days, the rehabilitation program focused on decontracting massage (deep transverse friction massage, myofascial trigger point release-ischemic compression) for the back muscles, exercises for the pelvis inclination (delordosing) in the dorsal, lateral decubitus position and sitting position to release tight back muscles and keep them flexible.

For the following period of time we have continued the massage procedures, and the delordosing exercises has been also performed in quadruped and ventral decubitus position. For the global reeducation techniques we have introduced other advanced postures. Once the severity

of pain has decreased exercises to strengthen the lower back and hip muscles, exercises that work the abdominal and back muscles to address posture, flexibility, and strength were added to the program.

During the last stage of the rehabilitation program the relaxing and firming massage was associated and was introduced the orthostatic position. Exercises using Bobath ball (65cm diameter) and exercises from hanging have been also added.

Results

Following the conservative treatment application, the patient registered a favorable evolution achieving improvements in spine mobility (results are illustrated in table no. 1 and fig. 2) and muscle deficit (starting from the value of 4 and reaching the value of 5), indicating the absence of low back pain (VAS score = 0) with a decreased level of antalgic scoliosis, as well as the absence of neurometameric distribution at the level of the right lower limb.

No	Testing/Evaluations/Scales	Initial	Intermediary	Final
1.	I. Schöber (cm)	18	21	22
2.	I. Fingertip-to-floor (cm)	31	20	9
3.	I. Chest-to-wall (cm)	9	13	16
4.	Left side bending (cm)	42	36	30
5.	Right side bending (cm)	51	44	32
6.	Lasègue (degree)	20	45	70
7.	Piriform stretch dr./stg (cm)	21/4	14/4	7/4
8.	Muscular force for lower limb	4-	4	5
8.	Rest/activity VAS (score)	3/9	1/6	0/0
9.	LBP (scor)	6	24	30
10.	Oswestry (scor)	29	17	0

Table 1. Results achieved by the patient during the rehabilitation program, for the 3 stages of the evaluation

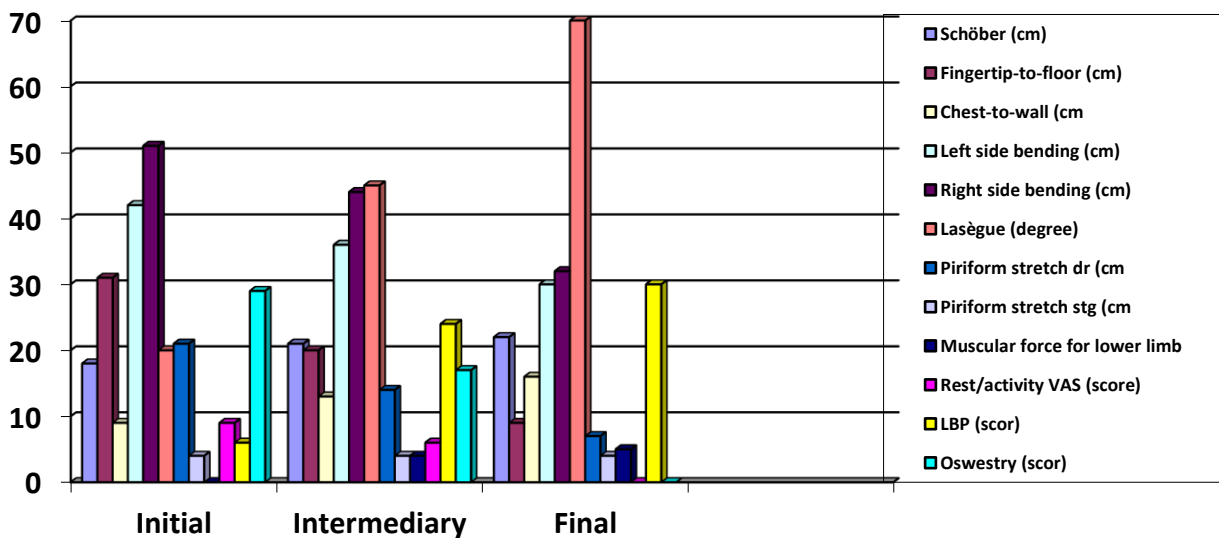


Fig 1. The evolution of the patient during the rehabilitation program

The application of LBP scale and of the Oswestry questionnaire revealed an improvement of the general condition of the body, indicating a significant evolution of the score (from 6 to 30 for LBP test and from 29 to 0 for the Oswestry questionnaire).

Repeating the MRI examination (Fig.3), one may notice a reduced involvement of right foraminal approach at the level of L4-L5 disc and the improvement of the vicious position of the spine.

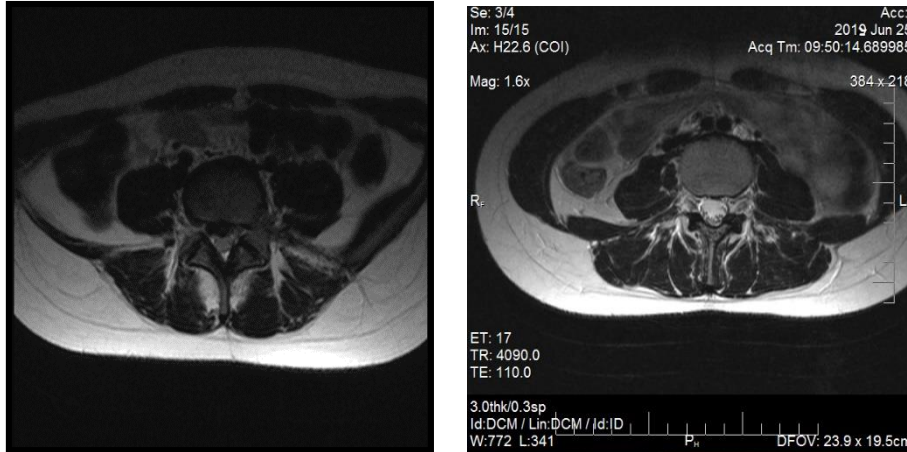


Fig.3 Lumbar spine MRI before and after rehabilitation program

Discussions and conclusions

Although the success of surgical treatment is well documented in adolescents, it has been found that in the absence of neurological deficit, lumbar disc herniation may benefit from conservative treatment[8].

This statement can also be supported by this particular case, which suggests that, for adolescents, aggressive non-surgical treatment is the first viable method for treating herniated disc. Kurihara and Kataoka appreciate that scoliosis, spinal muscular spasm and lower lumbar lordosis are quite common among patients treated by them. Severe neurological signs are less common in adolescents compared to adults diagnosed with disc herniation. [9].

Antalgic posture or scoliosis, severe limitation of lumbar mobility, significant limitation of straight leg raise and an abnormal and deviant gait are common symptoms of children and adolescents with disc herniation. These specifications are similar to our case, where the patient has accused low-back-pain associated with pain at the level of the lower limb, antalgic posture, and severe limitation of lumbar flexion, as well as a positive Lasègue sign.

Although there are a number of effective non-surgical methods including treatment with epidural steroid injections, the patient tends to choose the least invasive methods. For these reasons, the conservative therapy based on an aggressive rehabilitation program represented the patient's first option.

Conclusion

In conclusion, the therapeutic approach of rehabilitation patients with HDL is complex, targeting all pathophysiological links, and requiring associated treatment modalities: drug, exercises programs, physical therapy and education. Antalgic electrotherapy, massage, thermotherapy/cryotherapy and muscle relaxation techniques are obligatory adjuvants of exercises therapy, increasing patients' compliance with it and having a clear influence on regional back pain and muscle contracture. Any rehabilitation treatment in the lumbar region involves restoring the functionality of this segment, under conditions of muscular strength, stability and controlled movements at this level, with the prevention of neurological complications.

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