



Case report

REHABILITATION OF A YOUNG PATIENT WITH ACCIDENTALLY DISCOVERED SPONDYLOLISTHESIS

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ABSTRACT

This case presents the success of rehabilitation of young patient with spondylolisthesis, primarily due to correct diagnosis, made at the beginning of treatment, during the first physical examination. This is achieved with a well-taken detailed medical history, medical status and last but not least - imaging studies such as X-ray, MRI or CT scan. The appointment of any therapy and rehabilitation must be based on the diagnosis and correctly interpreted imaging studies. According to anamnestic data, it concerns a 15-year-old girl with complaints of easy fatigue, especially when standing or sitting for a long time, as well as during physical exertion. Lumbar spondylolisthesis can lead to disabling low back pain and neurological deficits. This review details the clinical history, neurological examination, clinical presentation, imaging modalities, and make the diagnosis lumbar spondylolistheses. Low back pain (LBP) is one of the most common causes of health disability, and continues to be the leading cause of disability over the last decade. The orthopedics status after 10-days course of treatment was improved.

Aim. The aim of this case report is to show the effect of rehabilitation of a young patient with acute lower back pain with incidentally discovered spondylolisthesis.

Materials and methods: One young female was included in this study. Neurological and orthopedic examination was performed at the begging and the treatment. X-RAY was performed. Methods of kinesiotherapy and rehabilitation were used. VAS.

Result: Reduction in the pain syndrome after the rehabilitation. Improvement in range of motion of spinal column. Complete recovery of the work capacity and resolving complaints.

Conclusion: Kinesiotherapy and rehabilitation methods remain effective, non-invasive methods of treating symptoms of spinal diseases, causing vertebral syndrome and in young patients with congenital abnormalities of the vertebrae but with good rehabilitation potential, refraining from operative treatment.

Keywords: X-RAY, vertebralogy, vertebral syndrome, spondylolisthesis, rehabilitation,

INTRODUCTION

This case report details the importance of clinical history, neurological examination, clinical presentation, imaging modalities, and current management standards for treating lumbar spondylolisthesis. The term spondylolisthesis comes from Greek word spondylos – vertebra, back and olisthesis – slippage, displacement. Spondylolisthesis refers to displacement, slippage of the body of one vertebra in a given direction, together with its upper articular and transverse process (resp. and the entire overlying vertebral column), in which the lower articular processes remain in an unchanged position relative to the vertebra lying below [1, 2] This slippage may be due to a break in the integrity of the arch due to the presence of spondylolysis or excessive lengthening (dysplasia) of the region intraarticularis. It is accepted to call spondylolisthesis the slippage of the cranial versus caudal vertebra. For example, spondylolisthesis of L5 means slippage of L5 and all cranial vertebrae relative to S1. The first information about slipping of the vertebrae dates back to 1782, when G. Herbineaux described a similar deformity. Purposefully, this issue began to be studied in the middle of the 19th century by the obstetrician N. Killian (1853), who first introduced the term “spondylolisthesis”. The Warsaw doctors D. F. Lamble (1856, 1895) and F. L. Neugebauer (1890). Their interest was determined by the appearing difficulties during the birth act in women suffering from spondylolisthesis. [3, 4] Brocher looks at three causes of the vertebrae slipping forward:

- 1) The displacement is caused by the presence of spondylolysis;
- 2) The shift is due to lengthening of the inter-articular parts of the arch
- 3) Displacement due to hypoplasia of the articular processes.

A particularly important reason for the appearance of spondylolisthesis is the vertical static of the person.

[9] research of the phylogeny of spondylolisthesis shows that this pathological condition occurs only in humans and is not observed in animals, i.e. and the great apes. [5,6] Neugebauer considers spondylolisthesis as a static deformity acquired after birth under the influence of the weight of the trunk under certain predisposing conditions of a congenital (insufficient ossification) or acquired nature (injures, physical loads). Brocher also mentions the role of the hereditary factor in the development of spondylolisthesis. [7,8] The pathoanatomy of spondylolisthesis includes two components. The first component of spondylolisthesis is slippage. The body of the affected vertebra is slipped forward (together with the superimposed vertebral column), and its arch remains in place backward and curves upward. With spondylolisthesis at L5, the entrance to the pelvis is narrowed by the slipped vertebra. Than the straight size of the entrance to the pelvis conjugate vera the distance from the most prominent point of the romontorium to the most prominent posterior point of the symphysis is less than 11sm, this fact in women leads, in turn, to a mechanical obstacle in the birth process. [8] Slippage is due to a defect most often in the isthmic part of the arch, which can be

- a) Cleft – spondylolysis.
- b) Dysplasia

The second component of spondylolisthesis is changes in the intervertebral disc. Lambie already suggested the spondylolisthesis is possible with soft elastic disc tissue”. It should be well known that, for perfectly understandable reasons, displacements of a vertebra cannot occur of a slipped vertebra should be regarded as a “loosening” of the disk, and spondylolisthesis as disease of the intervertebral disc” [9,10]

All types of spondylolistheses as a mandatory component include degeneration of the intervertebral disc, allowing the vertebra to slip. Disc space depletion is also commonly, but not always, observed. Now, according to modern understanding, spondylolisthesis is considered primarily as “a disease of the intervertebral part of the arch, the articular processes and the intervertebral disc.

Based on the available clinical trials, there is evidence that, compared with nonsurgical care, the surgical treatment of symptomatic spondylolisthesis offers a significant clinical benefit in the presence of progressive neurological deficits; cauda equina syndrome; failure of an adequate response to conservative therapy [11,12]

The increasing incidence of vertebrogenic diseases in young people nowadays has made us summarize, by presenting this case of, incidental finding on x-ray images, our experience in opportunities for physiotherapy

and kinesiotherapy treatment to maintain a normal active life for young people with such abnormalities.

Considering that these patients develop the so-called “vertebral syndrome”, we share our experience in reducing its symptoms, as well as maintaining a good quality of life through the methods of physical and rehabilitation medicine.

CASE DESCRIPTION

This patient presented in this case is a 15-year-old female. She attended the department of Physiotherapy and rehabilitation for the first time in November 2023 with complains of acute onset lower back pain (LBP) without any apparent cause. The pain appeared some days before attending the department when she during physical activity, which she practiced regularly. Without seeking medical attention or treatment, she stopped exercising and the pain subsided within a few days. However, the parents decided to consult a specialist. No medical tests or imaging tests were performed. Neither irradiation to the lower extremities, nor lower back pain on the day of admission. According to anamnestic data, it concerns a 15-year-old girl with complaints of easy fatigue, especially when standing or sitting for a long time, as well as during physical exertion. The LBP came on suddenly and after exertion and a long day of training, it led to a stiffness of the spine. After a few hours the pain subsided. This is the first time this has happened to the patient. A detailed anamnesis vitae was taken, and no evidence of falls, impacts, or car accidents in the past was found. A detailed orthopedic and neurological status was taken. Several deviations from the orthopedic status were found. Greatly increased lumbar lordosis and barely noticeable two transverse skin folds that hang over the abdomen and laterally at the waist. The upper lumbar region is pulled back. This disturbed statics required the muscles to work hard to support the torso, in which the long girdle muscles were tense or so called rigid – mm.erectores trunci. There was a slight hypertrophy of the muscles of the back, thighs and gluteus muscles. We believe that this is due to compensation for the insufficiency of the spine. We observed a slightly increased thoracic kyphosis. The entire torso was arched back. Above the sacrum, we palpated the spinous process of L5, above which a deep depression was palpated.. A dissociation was noted between the lengths of the bitrochanteric and biiliac lines, with the latter being larger. Michaelis' rhomboid was asymmetrical. From the spinal mobility examination, we found reduced mobility in the lower lumbar region. (Figure 1)

Fig. 1. Dissociation between the lengths of the bi-trochanteric and biiliac lines, with the latter being larger. Michaelis' rhomboid and waist triangles - asymmetrical



We observed limited spinal flexion, Schober's test was 2cm, and the left scapula also protruded. There was no limitation in lateroflexion. An objective symptom of spondylolisthesis - pelvic tilt was detected in this patient. (Figure 2)

Fig. 2. Limited spinal flexion, Schober's test 2cm, the left scapula protruded



Since it is practically impossible to make a diagnosis based only on clinical data without an X-ray examination, the patient was recommended to take an X-ray. The X-ray data helped to diagnose spondylolisthesis and the patient was prescribed a physiotherapy program and kinesiotherapy. The X-ray image showed forward displacement of L5, narrowing of the intervertebral fissure with subchondral sclerosis of the vertebral plates bordering this fissure and circumferential osteophytes, as well as pronounced deformation, sclerosis and change in the joint space between the articular processes of L5. (Figure 3)

Fig. 3. The X-ray image showed forward displacement of L5 vertebrae



AIM

The aim of this case report is to show the effect of rehabilitation of a young patient with acute lower back pain with incidentally discovered spondylolisthesis.

MATERIALS AND METHODS

1. Participants. One female patient was included in the study. She was 15 years old when attended the medical center to seek medical help.
2. X-Ray images were used for diagnosing and prescribing an individual program of rehabilitation
3. Clinical Examination of the patient. A detailed neurological and orthopedic examination was performed and rehabilitation potential was determined. The verte-

bral syndrome was evaluated. Spinal measurement methods for spinal mobility were used – SHOBER's test, OTT's test, fingers-floor test. Palpation was used to verify the degree of paravertebral muscle rigidity. Manual muscle test was used to measure the power of lower limbs. Centimetry for measuring the volume of the muscles of the lower extremities. VAS was used to assess the level of pain of the patient before and in the end of the treatment.

4. Physiotherapy and kinesiotherapy methods were used

RESULTS

1. Results from physical examination. The objective orthopedics status after 10-days course of treatment was: Stance – upright, with a slight scoliosis. A slightly pronounced vertebral syndrome: scoliosis (+); rigidity of paravertebral muscles (+); The upper lumbar region is still pulled back. There was a slight hypertrophy of the muscles of the back, thighs and gluteus muscles, but an increase in muscle volume of about 0.5 cm was found, which is why we believe that a 10-day course of treatment is extremely insufficient and the patient should undergo prophylaxis at least twice a year. Schöber's test 6 sm. without any pain; Lasègue's test (-); Achilles and knee reflexes D = S. Fingers – floor test: left 15sm., right 12sm.; Ott test – 1sm; We obtained the best result in the pain syndrome with a reduction in pain and discomfort from spondylolisthesis, measured by VAS scale – 0.

2. X-Ray images. There is no difference between the first and the comparative X-Ray in imaging the slipped vertebrae. The X-ray image showed forward displacement of L5. Due to this result, we believe that prolonged rehabilitation is necessary to maintain paravertebral muscle balance.

DISCUSSION

Most patients with spondylolisthesis can be managed conservatively, with asymptomatic patients able to maintain their current level of physical activity. However, if the patient has acute symptomatic spondylolisthesis, conservative treatments such as spinal bracing, activity modifications, and physical therapy are recommended

The prevalence of spondylolisthesis is 4% by age 6 and 6% by age 14 and thereafter remains constant throughout adulthood. There is a genetic predisposition with an increased incidence seen in: Males (male to female ratio of 2:1); First-degree offspring of patients with the condition; Concurrent pathologies such as spina bifida occulta, Marfan syndrome, osteogenesis imperfecta, and osteopetrosis. Adolescents involved in sports have a higher prevalence compared to those not involved in sports. The mean age of diagnosis is 15 years of age. There is an increased incidence among participants of certain higher-risk sports which involve repeated axial loading and/or lumbar hyperextension with rotation. These sports include gymnastics, football, wrestling, soccer, basketball, golf, tennis, volleyball, weightlifting, and butterfly and breaststroke swimming. [13, 14, 15]

CONCLUSION

The prognosis in patients with spondylolisthesis is usually excellent. Asymptomatic individuals require no specific treatments or any modifications to activities of daily living. Even patients who present with symptomatic spondylolisthesis usually have a very favorable prognosis as validated by a recent meta-analysis which demonstrated that 92% of the adolescent athletes were able to return to competitions when they are treated conservatively, and 90% of the time when managed surgically. [15, 16] In the majority of patients with spondylolisthesis, the condition is occult and remains asymptomatic throughout their lifetimes. However, degenerative disk disease and resultant spondylolisthesis, which typically occurs as a sequela the aging process, have a propensity to be accelerated in patients with spondylolisthesis. This may lead to spinal stenosis and lumbar radiculopathies. This case report shows the effectiveness of rehabilitation and kinesiotherapy on pain syndrome as well as on orthopedic status of the patient with spondylolisthesis. Physical therapy emphasizing spinal stabilization through stretching of the hip flexors, hamstrings, quadriceps, gastrocnemius-soleus complex, and strengthening of the abdominal and back muscles utilizing a pain-free range of motion with the application of the progressive resistance training protocol.

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Please cite this article as: Gecheva-Fermezdzhieva G. Rehabilitation of a young patient with accidentally discovered spondylolisthesis. *J of IMAB.* 2025 Apr-Jun;31(2):6166-6170. [Crossref - <https://doi.org/10.5272/jimab.2025312.6166>]



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