Juniper Online Journal of
Orthopedic & Orthoplastic Surgery
ISSN: 2641-8266

Opinion
Volume 1 Issue 5 - August 2018
DOI: 10.19080/JOJOOS.2018.01.555575

JOJ Orthoped Ortho Surg

Motor Control Changes in Patients with Degenerative Deformities Of the Spine After Lumbar Fusion

Kolesnichenko Vera* and Gresko Igor

National Academy of Medical Sciences of Ukraine, Ukraine

Submission: August 01, 2018; **Published:** August 03, 2018

***Corresponding author:** Kolesnichenko Vera, Sytenko Institute of Spine and Joint Pathology, National Academy of Medical Sciences of Ukraine, Kharkov, Ukraine, Email: veakol@rambler.ru

Abstract

The parameters of motor control of the lumbar-pelvic region muscles were studied in 40 patients with degenerative disc diseases at the age of 20-40 years before the operation and after 3, 6, 12 months after lumbar fusion with partial correction of lumbar lordosis and sacral slope. Changes in these parameters were detected during the whole observation period.

Keywords: Motor control; Degenerative spinal deformity; Lumbar fusion; Diagnostics

Summary of background data

Assessment of motor control of the lumbar-pelvic region muscles is an important stage in the clinical examination of patients with degenerative disc diseases. It allows to identify functional disorders, to determine the target program of musculoskeletal therapy and, thus, to improve the functional result of surgical or conservative treatment.

Objectives

To study motor control changes of the muscles of the lumbar-pelvic region in patients with degenerative deformities of the spine after lumbar fusion.

Material and Methods

We retrospectively analyzed the protocols of a clinical and radiological examination of 40 patients with degenerative disc diseases at the age of 20-40 years. All patients underwent a posterolateral instrumented fusion of the L4-L5 segment. All patients were examined before surgery and at 3, 6, 12 months and more after surgical treatment with an average follow-up period of 1.2 ± 0.8 years.

Clinical examination studied the mobility of the thoracic and lumbar spine according to the Schober's method, and the amplitude of flexion of the spine according to the results of the "finger-to-floor" test. Motor control tests were used performed to assess the control of active movements in the lumbar-pelvic region.

The intensity of low back pain during daily activities was assessed by means of the 100-mm visual analogue scale (VAS) ratings. Disability due to back pain (ODI) was assessed by the Owelty Disability Questionnaire, version 2.0. The level necrophobia was assessed by the Tampa Scale for Necrophobia (TSK). The level of worry and anxiety associated with the expectation of pain was assessed by the Pain and Anxiety Symptoms Scale (PASS) – 20. On the lumbar spondylalgias in lateral view in the upright position, the lumbar lordosis GLL was measured according to the [1] and the sacral slope SS was measured according to [2].

Results

Before surgery, a flattening of the sagittal contour of the lumbosacral spine according to the type of degenerative deformation "flat back" was observed in all patients. Posterolateral instrumented fusion of the lumbar spine was accompanied by intraoperative correction of spinal-pelvic imbalance with an increase of the lumbar lordosis depth and horizontal sacral slope, although after surgery GLL and SS parameters remained below normal. This leads to developing biomechanical insufficiency of the muscles - local stabilizers of the lumbar segments. Developing muscle imbalance with a tendency to increase the bending moment potentiates the flattening of lumbar lordosis.

In patients before the operation and throughout the follow-up period after surgical treatment, my fixation of the lumbar segments and incorrect motor patterns were observed. They were persisted due to antalgic myotonic reactions of the muscles of the lumbar-pelvic region. These changes in motor strategies can be associated either with a change of the coactivation of

muscles - antagonists (flexors and extensors of the trunk), either with a change in the activation sequence of synergists (thoracic and lumbar part of the m. erector spinae, m. quadratus lumborum). After surgical treatment pain intensity significantly decreased by VAS ($p < 0.05$), and disability degree by ODI ($p < 0.05$).

Conclusions

In patients with degenerative disc diseases there are disorders of motor control of the muscles of the lumbar-pelvic region at all stages of fusion of the lumbar spine associated with a combination of antalgic and degenerative deformations of the spine.

References

1. Cobb JR (1948) Outline for the Study of Scoliosis. Instruct Course Lectures. The Am Acad of Orthop Surg 5: 261-275.
2. Duval Beaupere G, Schmidt C, Cosson PH (1992) A Barycentremetric Study of the Sagittal Shape of the Spine and Pelvis Ann Biomed Eng 20(4): 451-462.

DOI: 10.19080/JOJOOS.2018.01.555575

How to cite this article: Kolesnichenko Vera, Gresko Igor. Motor Control Changes in Patients with Degenerative Deformities Of the Spine After Lumbar Fusion. JOJ Orthoped Ortho Surg. 2018; 1(5): 555575. DOI: 10.19080/JOJOOS.2018.01.555575