Development of innovative training solutions in the field of functional evaluation aimed at updating of the curricula of health sciences schools

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MODULE BIOMECHANICS OF SPINE

Didactic Unit D: INSTRUMENTED ANALYSIS OF THE SPINE

D.5. How do I interpret a biomechanical instrumented analysis report in a case of spinal pathology?

CLASS ACTIVITY: *Biomechanical assessment of cervical pathology*

Case 1: 49-year old woman.

Profession: Educational psychologist. Director of nursery school.

Medical record: Not relevant.

Clinical picture resulting in sick leave: Neck pain after traffic accident, rear-end collision.

Diagnostic tests performed and results: The X-ray at the emergency room showed cervical rectification.

The cervical NMR evidenced disc protrusions at C4-C5 and C5-C6 with mild biforaminal and spinal canal stenosis predominantly at C5-C6.

Treatment prescribed: Rehabilitation at the insurance company.

Progress: During the first evaluation in the consulting room, she reports cervical pain that limits her activities.

Physical examination: Pain on palpation of the paravertebral muscles and limited mobility in lateral flexions and rotations.

Given this clinical picture, a biomechanical test was performed to monitor her disability process. The test made it possible to objectify the mobility of the cervical spine considering both the ranges of movement and the smoothness of the movements, which may be affected by pain. As you can see later, the first assessment shows a pattern of significant functional disorder with a marked limitation of cervical mobility. The patient started a rehabilitative treatment and another biomechanical assessment was performed after 19 rehabilitation sessions, which showed a significant improvement in her limitation.

The aim of these tests was to have a more objective measure of this limitation that could be used as control in subsequent assessments.

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Results of the biomechanical assessment test: Kinematic analysis of cervical mobility
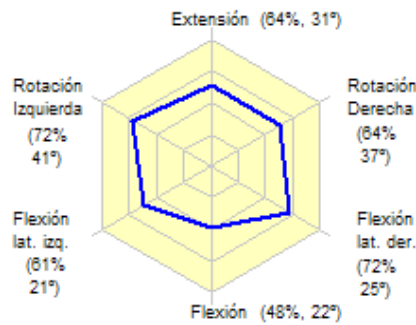
1. Results of the 1st cervical assessment

Figure 1. Visual hexagon of the range of motion together with its percentage of normality.

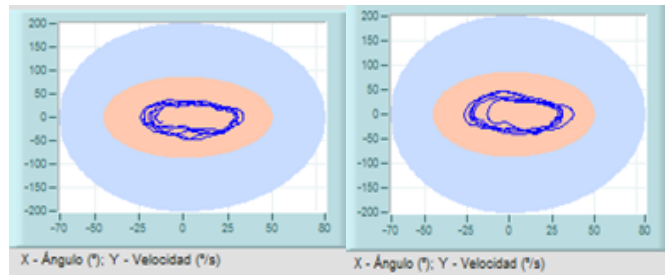With regard to the mobility of the cervical spine in relation to its speed of movement, the results obtained are as follows:

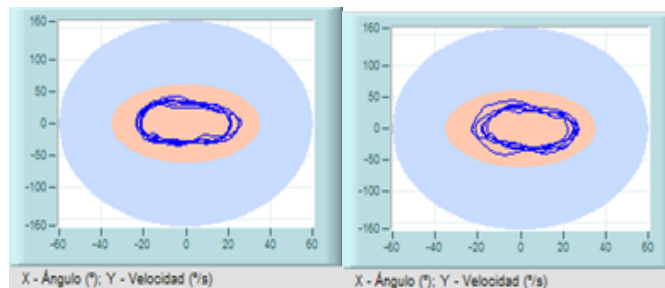Figure 2. Flexion-extension test of two consecutive measurements.

Figure 3. Lateral flexion test of two consecutive measurements.
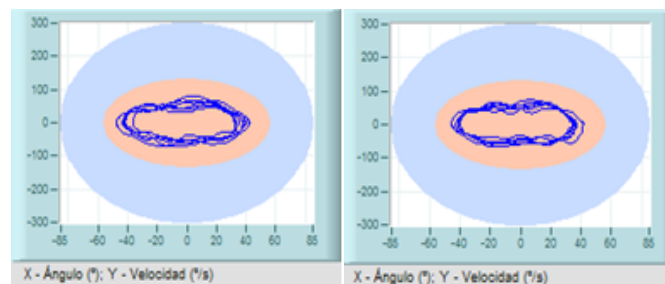

Figure 4. Rotation test of two consecutive measurements.

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2. Results of the cervical assessment at the end of the rehabilitation treatment
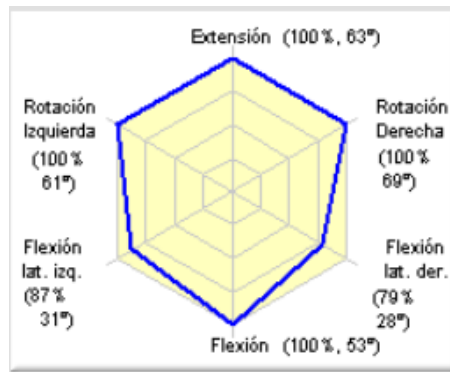

Figure 5. Visual hexagon of the range of motion after a 2-month progress together with the percentage of normality.

Regarding the mobility of the spine in relation to its speed of movement, the results were as follows:
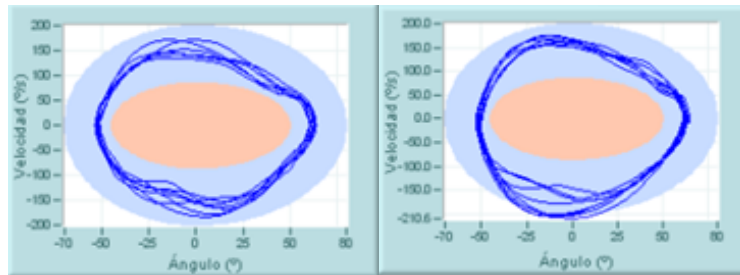

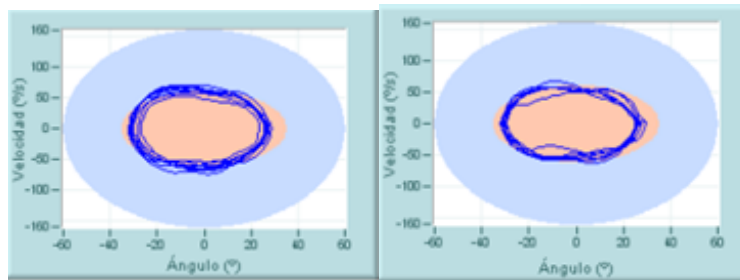Figure 6. Cervical flexion-extension test of two consecutive measurements.

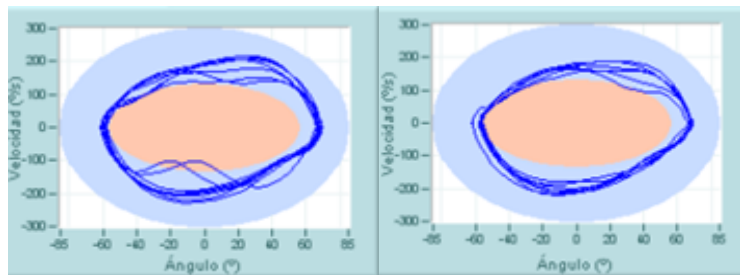Figure 7. Lateral flexion test of two consecutive measurements.

Figure 8. Rotation test of two consecutive measurements.

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QUESTIONS

The student can answer these questions by themselves or in group, through software like Kahoot, or coloured cards (red for YES, green for NO, yellow for NOT SURE):

Is there a limitation of cervical mobility?

YES / NO / NOT SURE

Which is the most limited movement?

YES / NO / NOT SURE

Does she perform quick neck flexion-extension movements?

YES / NO / NOT SURE

Is there any asymmetry in the movement?

YES / NO / NOT SURE

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Based on the graph, does she perform repeatable movements?

YES / NO / NOT SURE

Is there an improvement in the second biomechanical assessment session?

YES / NO / NOT SURE