Long-term observation of a patient with rotary subluxation of the first cervical vertebra. A case report

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ABSTRACT

Instability is defined as a loss of stiffness in a moving segment such that applying a force to that segment causes a greater displacement than a normal structure. Instability is often accompanied by pain, possible damage to neurological structures, and progression of the deformity. Symptoms resulting from cervical instability mainly affect young, middle-aged, and women. Assessing the instability of the cervical spine is often problematic. CT (computed tomography) and MR (magnetic resonance) examinations should be performed to diagnose patients with peak-rotational instability. There are several recommendations in the literature for treating patients with cervical instability; however, there are still no common guidelines. The aim of the paper is to present the case of a 17-year-old girl with rotational subluxation of the first cervical vertebra.

Keywords: Atlantoaxial instability, atlantoaxial rotatory subluxation, neck symptom, C1-C2 instability

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INTRODUCTION

About 70% of the population experiences pain in the cervical spine. The cervical section is the most mobile section of the spine, which is possible thanks to the correct function, structure, and cooperation of such elements as, among others: the osteoarticular, ligamentous-capsular, nervous, and muscular systems. Movements in this section of the cervical spine are a combination of movements occurring in all intervertebral discs and joints. During rest and in motion, the articular capsules, as well as the ligaments: transverse, interspine, supraspinal, yellow, longitudinal anterior, and posterior, are responsible for the stabilization of these elements. Tendons and muscles, as active stabilizers, generate forces necessary to stabilize the spine during changing loads; they are more responsible for controlling the movement, its formation, and execution [1]. Instability is defined as a loss of stiffness in a moving segment such that applying a force to that segment causes a more significant displacement than a normal structure. Instability is often accompanied by pain, possible damage to neurological structures, and progression of deformity [1]. Assessing the instability of the cervical spine is often problematic—symptoms of cervical instability concern mainly young, middle-aged people and mostly women [1]. Although neck pain is a frequent source of disability, little information is available on its occurrence and course [2].

CASE REPORT

We report a girl, 17 years old, with rotary subluxation of the first cervical vertebra. In 2005, the girl suffered a cervical spine injury with a tooth fracture in a rotating vertebra due to a traffic accident. A Control MRI of the cervical spine was not performed until June 2020. The patient remains under the care of the Neurosurgical, Rehabilitation, and Neurological Clinics due to recurrent back pain with numbness of the limbs and the Psychiatric Clinic (obsessive-compulsive disorders). The girl was hospitalized three times. During her stay 2005 at the Department of Pediatric Neurology, she was diagnosed with an arachnoid cyst and anisocoria. Then, in 2013, the patient was diagnosed with low back pain and instability of the C1 / C2 segment of the spine. In 2016, the girl was reported to the hospital with a headache. In June 2020, the patient fainted and collapsed during her stay at the Paediatrics Department. On January 13, 2022, she was referred to the Children's Rehabilitation Department in Białystok due to chronic headaches in the occipital area and periodic numbness of the limbs and cervical and lumbar spine. The patient's general condition was good on admission to the Children's Rehabilitation Clinic in Białystok in 2022. The physical examination revealed limited cervical spine mobility - flexion, hyperextension, sideways movements, and pain in the cervical spine. Deep cervical lordosis and palpation pain in the neck muscles, nape, and paraspinal muscles without root symptoms were found. During hospitalization, the girl reported L / S spine pains. Behavioral and emotional disorders were also observed in the patient. On January 9, 2022, a 17-year-old girl reported a headache and a depressed mood was found, and in the bathroom, she provoked vomiting after eating. Healed marks on the hand after being hit with a hard object, and on the thighs, marks of self-mutilation. Ecchymosis was observed on the girl's face after vomiting. The patient required special observation by the nursing staff. An individual rehabilitation program included exercises, physical therapy, and pharmacological treatment. The patient performed: general individual exercises, assisted exercises, coordination exercises, balance exercises, and active breathing exercises with resistance. Psychological therapy, special education for people with disabilities, and occupational therapy were also used. In the field of physical therapy, the following were used: dry massage - partial, laser therapy - scanner, phototherapy - local infrared irradiation, and constant and low-frequency magnetic field. Pharmacological treatment was based on administering Hydroxizinum, Triderm, Vigantoletten, Apo-Doxan. The patient was discharged from the hospital in good general condition and recommended continuing rehabilitation in an outpatient setting and care in Specialist Outpatient Clinics. Moreover, it was recommended to consult a psychiatrist due to the high rate of risky behavior in the future. The further course of action depends on the decision of the psychiatrist.

DISCUSSION

Injuries of the atrophic joint are one of the most common consequences of road accidents. About 15% of all cervical spine fractures are rotor tooth fractures. In 2005, the patient also suffered a cervical spine injury with a broken vertebrae tooth due to a traffic accident. Damage to the ligamentous apparatus and fracture of the rotor tooth may result in a dorsal or ventral displacement in the C1-C2 complex, spinal cord compression, and sprains [3]. According to literature data, the diagnostics of patients with peak-rotational instability should be based mainly on CT (computed tomography) and MRI (magnetic resonance imaging) examinations, and less frequently, functional radiographs should be performed [4]. The first-line treatment for peak-rotational instability should be conservative management using, for example, external cervical orthoses or empiric antibiotics, muscle relaxants,

and analgesic therapy. High degree instability or the lack of a stable reduction are indications for the use of surgical fixation. There are several recommendations in the literature for treating patients with cervical instability; however, there are still no standard guidelines [5]. The course of multidisciplinary care improved the quality of life of the described patient and undoubtedly contributed to minimizing the symptoms of peak-rotational instability.

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Conflicts of interest

The authors declared no conflicts of interest.

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