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C2 Odontoid Process Pathology in A Patient with Cervicogenic Headache

Servikojenik Baş Ağrısı Olan Bir Hastada C2 Odontoid Process Patolojisi

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Abstract

Cervicogenic headache is a type of pain in which the trigeminocervical nucleus plays a role. It starts from the neck unilaterally and spreads forward. The patient's neck flexion-rotation mobility decreases. Careful examination of the neck is required. Its pathogenesis is not clear, and it is thought to be caused by various structures in the neck. However, it has been stated that there may not be specific findings in cervical magnetic resonance imaging (MRI). A 62-year-old female patient presented with a headache radiating from her left neck to her head for 13 years. The diagnosis of cervicogenic headache was considered in the patient, and C2 odontoid process irregularity was detected in cervical MRI. We wanted to present our case of cervicogenic headache, who have specific cervical image findings.

Keywords: Cervicogenic Headache, Odontoid Process, Headache

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Öz

Servikojenik baş ağrısı, trigeminoservikal çekirdeğin rol oynadığı bir ağrı türüdür. Boyundan tek taraflı olarak başlar ve öne doğru yayılır. Hastanın boyun fleksiyon-rotasyon hareketliliği azalır. Boyunun dikkatlice muayene edilmesi gerekir. Patogenezi net değildir ve boyundaki çeşitli yapılardan kaynaklandığı düşünülmektedir. Ancak servikal manyetik rezonans görüntüleme (MRG) 'da spesifik bulgular olmayabileceği belirtilmiştir. 62 yaşında kadın hasta, 13 yıldır sol boynundan başına doğru yayılan baş ağrısı şikayetiyle başvurdu. Hastada servikojenik baş ağrısı tanısı düşünüldü ve servikal MRG'da C2 odontoid çıkıntı düzensizliği tespit edildi. Servikojenik baş ağrısı şikâyeti olan ve spesifik servikal görüntü bulguları olan olgumuzu sunmak istedik.

Anahtar Kelimeler: Servikojenik Baş Ağrısı, Odontoid Process, Baş Ağrısı

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Introduction

The cervicogenic headache was defined in 1983 (1), the diagnostic criteria were updated in 2018 (2), and a new diagnostic criterion was introduced to address the limitations of the classification (3). The diagnostic criteria for cervicogenic headache according to the International Classification of Headache Disorders, 3rd edition (ICHD-3) (2):

A. Any headache fulfilling criterion C

B. Clinical and/or imaging evidence1 of a disorder or lesion within the cervical spine or soft tissues of the neck, known to be able to cause headache2

C. Evidence of causation demonstrated by at least two of the following:

1. A headache has developed in temporal relation to the onset of the cervical disorder or appearance of the lesion
2. The headache has significantly improved or resolved in parallel with improvement in or resolution of the cervical disorder or lesion
3. The cervical range of motion is reduced, and the headache is made significantly worse by provocative manœuvres
4. A headache is abolished following diagnostic blockade of a cervical structure or its nerve supply

D. Not better accounted for by another ICHD-3 diagnosis

Its prevalence is 4% (4,5). It is a referred pain that can be caused by different etiologies arising from the cervical structures innervated by the C1, C2 and C3 spinal nerves, and the trigeminocervical nucleus plays an important role (3,6,7). Cervicogenic headache is unilateral. It starts from the neck, spreads forward, and the mobility of the neck decreases. Neck pain spreads from the shoulder to the arm. The pain can be triggered by pressure on sensitive areas when the neck is placed in an uncomfortable position. Decreased range of motion of the neck joint is significant in the flexion-rotation test, and a careful clinical examination of the neck should be performed. In the treatment, transcutaneous electrical nerve stimulation (TENS), exercise, nerve blockade, and invasive interventional treatment can be recommended, depending on the cause of the pain (3).

Although the pathogenesis of cervicogenic headache is not clear, it is generally thought that cervicogenic headache may arise from various structures in the neck (8,9). In a study using conventional cervical magnetic resonance imaging (MRI), no significant difference was found between patients with cervicogenic headache and control subjects. MRI; It has been stated that it may not be an adequate method to detect the underlying pathological process of cervicogenic headache etiology, such as nerve roots, intervertebral joints, and periosteum disorder (9). There was no publication in the literature indicating the relationship between cervicogenic headache and odontoid process irregularity. Regarding this, we wanted to present our case with the coexistence of cervicogenic headache and C2 odontoid process pathology.

Case

She applied to our neurology outpatient clinic with the complaint of a headache that occurred every day after a bicycle crash 2 years ago, recurring 2-3 times a day, throbbing, lasting approximately 15 minutes, very severe (Visual analog scale (VAS):10), starting from the left side of the neck and spreading to the left frontal area. There may have been photophobia and phonophobia in pain attacks. She did not complain of nausea and vomiting. It was not accompanied by autonomic features. It would occur at any time of the day and was relieved by neck movement. The pain radiates to the left arm and shoulder. She was taking analgesics during attacks. She had hypertension, lumbar and cervical (C6-7) discopathy, as it was seen in her medical history. There was no migraine headache. She also had a history of a headache that started 13 years ago and lasted for 10-15 days per month. The patient was investigated for arthralgia complaints, but no diagnosis of rheumatological disease was found. The physical therapy and rehabilitation department followed up with osteoporosis. In the neurological examination, it was seen that there was pain when pressure was applied with a fınger on both greater occipital nerves (GON) and the pain was spread to the left frontale on the left side, the

neck flexion-rotation joint range of motion was measured with a goniometer, right: 45 degrees left: 30 degrees, and there was a limitation more than 10 degrees of motion. The paravertebral tenderness was positive, and there was a trigger point in the trapezius prominent on the left on palpation. In laboratory values, the liver function tests and the kidney function tests were normal. Rheumatoid factor (RF): 9.1(<14), C-reactive protein (CRP):1.9, Sedimentation: 4, Antinuclear antibody (ANA): (-) was detected. Cranial MRI showed chronic ischemic changes. In cervical MRI, the C2 odontoid process was irregular in the T2 sequence (Figure 1), the signal was decreased in T1, and there was protrusion in C6-7 (Figure 2).



Figure 1. C2 odontoid process irregularity in T2 sequence in cervical MRI



Figure 2. Cervical MRI T1 sequence C2 odontoid process signal decrease

In our patient with degenerative C2 odontoid process disorder, a diagnosis of cervicogenic headache was considered based on clinical and neurological examination.

Left GON block was administered with consent, and duloxetine 30 mg was started. In the first month after the treatment, the headache regressed to 5-6 days and VAS: 8. The patient's functionality increased.

Discussion

According to the proposed new cervicogenic headache criteria (3), cervicogenic headache was considered because there was a limited range of motion in the flexion-rotation of the neck, and the pain was provoked when pressure was applied with a fınger on the left GON, and the pain was spread to the left frontal. C2 odontoid process pathology was present as a cervical MRI finding; it responded well to the GON block and could not be explained by another headache. Many symptoms can be similar to those of primary headaches, such as migraines and tension headaches (10). Cervicogenic or post-traumatic headaches may occur after whiplash injury (11). There has been reports of cases of post-traumatic cervicogenic headaches (12).

Cervicogenic headache may be caused by various anatomical structures in the cervical spine (13). The craniovertebral junction is stabilized by joint capsules, tectorial membrane, and transverse and alar ligaments. These anatomical structures are innervated by the C2 root (14,15). Pain spreads from the cervical spine to the head because the nociceptive afferents of the trigeminal and upper three cervical spinal nerves reach the second-order neurons in the trigemino-cervical nucleus in the upper cervical spinal cord (14,16,17). The lateral atlanto-axial joint is responsible for 16% of cervicogenic headache cases (18). However, MRI may not show any specific changes in cervical discs or craniovertebral ligaments in cervicogenic headache (14).

The odontoid process is part of the C2 or axis vertebra and forms the axis of the structures that make up the craniovertebral junction. Odontoid pathologies may be congenital or acquired. Congenital anomalies include types of odontoid dysgenesis. Acquired odontoid anomalies can be traumatic, degenerative, inflammatory, or neoplastic (19,20,21).

Our case had a cervicogenic headache and a degenerative C2 odontoid process irregularity at cervical MRI findings. The increase in the frequency of cervicogenic headache after a bicycle crash raises the question of whether it may be related to the accident. The important aspect of this case is the detection of C2 odontoid process irregularity in cervical MRI in our patient with cervicogenic headache, contrary to the previous studies in patients with cervicogenic headache, indicating that MRI may not have specific findings.

Therefore, we wanted to present our case with the coexistence of cervicogenic headache and degenerative C2 odontoid process irregularity.

Conclusions

C2 odontoid process pathology may be a specific finding in cervical MRI in our patient with a diagnosis of cervicogenic headache.

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