

# The benefits of the C1 and C2 vertebrae derotation in a patient with chronic cervical myofascial pain.

## Предности деротације Ц1 и Ц2 код пацијента са хроничним миофасцијалним боловима у врату

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PRIMLJEN 06.09.2017.

PRIHVAĆEN 28.11.2017.

RECEIVED 06.09.2017.

ACCEPTED 28.11.2017.

### ABSTRACT

**Objective.** The aim of this study was to present the case of a patient with chronic cervical pain and an elevated postural imbalance in the frontal plane.

**Method.** The present case report was carried out in June 2017. The subjective assessment of the pain, the global postural assessment, the computerized baropodometry, the assessment of the walking and the biomechanics of the foot and functional tests (Fukuda, Romberg, VAD 2.7, Vasyli Medical and Sahrman), were used to assess the postural imbalance.

**Results.** The objective results were the immediate alignment of the cranium and underjaw to the central line of the body, a partial cancellation of the compensatory pathological curves from the area of the dorsal lumbar spine and the amplification of the laterality movement. The subjective result, as reported by the patient, was the absence of the previously felt discomfort at the active cranio-cervical mobility test, in the left laterality movement.

**Conclusion.** The manual derotation of the C1 and C2 vertebrae resulted in efficient and long-term postural rehabilitation by canceling the fascial constraints and asymmetries at the base of the skull that maintained the postural syndrome, responsible in time for the onset of the symptomatology.

**Key words:** neck pain; movement disorders; joint diseases.

### АПСТРАКТ

**Циљ.** Циљ ове студије је био да се прикаже случај пацијента са хроничним боловима у врату и повећаним постуралним дисбалансом у фронталној равни.

**Метод.** Овај случај се десио у јуну 2017. године. За процену постуралне неравнотеже коришћени су: субјективна процена бола, глобална постурална процена, компјутеризована бароподометрија, процена ходања и биомеханика ногу и функционални тестови (Fukuda, Romberg, VAD 2.7, Vasyli Medical and Sahrman).

**Резултати.** Објективни резултати били су непосредно поравнање лобањског и доњег дела на централној линији тела, делимично ублажавање компензаторних патолошких кривина из подручја дорзалне лумбалне кичме и амплификација латералне покретљивости. Субјективни резултат, како је извештавао пацијент, био је одсуство ранијег осећаја неугодности на тесту активности кранио-цервикалног покрета, у покрету ка левој страни.

**Закључак.** Мануално деротирање C1 и C2 пршљена довело је до ефикасне и дугорочне постуралне рехабилитације поништењем фасцијалних ограничења и асиметрије на бази лобање која су одржавала постурални синдром, а која су својевремено била и одговорна за настанак симптоматологије.

**Кључне речи:** бол у врату; поремећаји покрета; болести зглобова.

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## INTRODUCTION

The chronic cervical pain (CCP) is an extremely frequent symptom in the general population, a fact that might soon transform it into a public health problem. Due to its high incidence and the expansion of the age of the affected population – if in the past it was a symptom associated especially with old people, nowadays it is spread among young people and even children –, the CCP becomes a topical subject in the scientific researches in different fields.<sup>1</sup> All these have as goal the development of some effective preventive and therapy methods, based especially on the accurate identification of the causes and an exact understanding of the implied pathological mechanisms.

The remission of the symptoms, the elimination of the causes, but also the blocking of the reoccurrence would have a major positive impact upon the state of health of the affected population, the improvement of the quality of the personal and professional life, but also upon the budget of the sanitary system.<sup>2-6</sup>

For an accurate diagnostic and classification of the CCP, the clinical practice uses concepts of the multifactorial theory. The mechanic origin is the most incriminated one, amplified in many cases by a psychological component.

The present study explores the mechanisms involved in the chronic pain, which induce and maintain, in fact, the initial biomechanical imbalance, as well as the elements that worsen the CCP or that generate contexts that may delude the diagnostician.

## PATIENT AND METHOD

The 32 years-old female patient came with the following complaints: cervical pains (especially when sitting) that irradiates ascendant (cervicogenic headache) and postural imbalance, mainly in frontal plane, noticed by the patient. She has also an orthodontic diagnosis of malocclusion and an important gingival retraction, attributed to an alteration of the mandibular dynamics.

The clinical symptoms were: a restriction of the upper cervical rachis with an important limitation of the left inclination of the cranium, that indicates an ample rotation of the C2 vertebra to the right;<sup>7</sup> a limitation of the left rotation of the cranium, which demonstrates a rotation of the C1 vertebra, also to the right; sounds and pain at the temporomandibular joint (TMJ); reported bruxism; trigger points in the suboccipital area, with high sensitivity on the right; fascial restriction areas on the whole head surface; tension of the bilateral masseter muscles

(there can be appreciated a slight hypertrophy of these structures); an important deviation, towards right, of the center line of the cranium compared to the center line of the body, that persists in all the examined positions and gestures (orthostatism, sitting in decubitus, bending gesture, imitation of some daily gestures); an inclination of the bipupilar line and of the occlusal plane towards right, even after the correction of the position of the head; the adaptation (with structuring phenomena) of the dorsal and lumbar spine to the above-mentioned proximal imbalance.

All the receptors of the postural system implied in the installation of the postural imbalance painfully manifested (foot, vestibule, eye, scapular and pelvic girdle) were assessed with scientifically validated tests: Fukuda, Romberg, VAD 2.7 – Visual Acuity Difference, Vasyli Medical, Sahrman. We draw the conclusion that there is no disorder of the previously named receptors, the assumption of the implication of the C1, C2 rotation in the postural syndrome already categorized remaining valid.

Based on the clinical symptoms (pain, imbalance), the objective findings of the assessment and the results of the tests used, the diagnosis is a malposition with primary biomechanical dysfunction of the C2 vertebra.

The manual derotation technique of the C1 and C2 vertebrae was applied. The patient was then invited to perform habitual moves and postures (walking, sitting, picking up an object) to make sure that the subsequent measurements would not be altered by the conscious maintenance of the new position obtained after the derotation. 15 minutes after, a new set of pictures was made, from the same planes.



Figure 1. Initial posture, before performing the derotation maneuver of C1, C2 vertebrae.



Figure 2. Initial posture, before performing the derotation maneuver of C1, C2 vertebrae (imbalance of the center line of the cranium).

The objective results were the immediate alignment of the cranium and underjaw to the central line of the body, a partial cancellation of the compensatory pathological curves from the area of the dorsal lumbar spine and the amplification of the laterality movement. The subjective result, as reported by the patient, was the absence of the previously felt discomfort at the active craniocervical mobility test, in the left laterality movement.



**Figure 3.** Posture adopted 15 minutes after the normalization maneuver C1, C2 (improvement at the level of the triangle of the waistline).



**Figure 4.** Posture adopted 15 minutes after the normalization maneuver C1, C2 (rectification of the center line of the cranium).

A postural realignment has to consider always the active causes that generate the first asymmetries and the pathological indicators that maintain them. In the present case, the craniocervical asymmetry was generated by a primary rotation of the C2 vertebra. According to the observations of the orthodontists, this rotation might have significantly been amplified by a dental occlusal problem, what we can also confirm, considering that, also at this level, the contacts between the arcades are uniform and better distributed in position of initial asymmetry and after the C1, C2 derotation some contacts in the posterior group are lost.

Although the malocclusion was implied in the accentuation of the C1, C2 rotation, this cannot be considered the primary cause of the imbalance from this level, the bipupilar and occlusal axes inclined in the same direction confirming the organization of these tissues in a certain asymmetry from the primary and transitional dentition periods. During the last years, by adopting a sedentary position, the patient maintained this imbalance also through an ascendant mechanism (of multidirectional sacral lumbar instability).

## DISCUSSION

The manual derotation of C1, C2 vertebrae creates conditions for a long-term effective postural rehabilitation, once the fascial restrictions and the asymmetries at the bottom of the cranium, considered to back the vicious circle of the postural syndrome, are cancelled.<sup>8</sup> These postural syndromes are always responsible for the occurrence of the symptoms, but, unfortunately, the pain appears after many years from the installation of the first pathological changes. Therefore, the therapeutic strategies must take into account an approach of all the tissues that suffered during the adaptation process, tissues that are distributed all over the body surface, with representations that differ dependent on the area.

Most of the times the patient memorizes the asymmetric schemas, adopts and maintains them involuntarily, rebalancing of the postural system being erroneously perceived as unnatural. In order to solve this perception conflict, introducing a program of proprioceptive reeducation in the therapeutic plan is mandatory.

The identification of all the sources of the postural disorders is important, from the receptors to the tissues adapted to a new schema considered by the postural system as being ideal regarding the energetic consumption. But, the most important aspect is represented by the interruption of the vicious circle in the key area, the most active one regarding the induced negative effects, even though this key area is limited to small sized segments, with balance rates of millimeters.

A very important aspect is represented by another category of tension sources for the muscular tissues, and namely bruxism, where a psychotherapeutic intervention is necessary.

The result of this first intervention in the present case adds another confirmation to what we have noticed during our clinical practice, namely that not the pain becomes chronic, but this is only a normal response to the chronic course of a biomechanical imbalance, with negative impact upon the strongly innervated tissues, their permanent irritation causing the "corticalization" of the painful syndrome and thus the patient's false invalidating perception that his problem could have solutions only at the level of symptoms control.

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