

# Case Study

## Resolution of Cluster Headaches in a Female Using Koren Specific Technique (KST): A Case Report

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### Abstract

**Objective:** This case study reports on a female patient suffering from cluster headaches who was successfully treated with the Koren Specific Technique.

**Clinical Features:** A forty seven year old female with subluxations and a diagnosis of cluster headaches presented with complaints of headaches and neck stiffness that began two years prior to seeking chiropractic treatment. Originally diagnosed with migraine, drug therapy for that failed. This delay of proper treatment left her with feelings of hopelessness, despair, and thoughts of suicide.

**Interventions and Outcomes:** The patient was adjusted with the Koren Specific Technique (KST). The patient was adjusted three times per week for the first four weeks and then on an average of once a week for four months. After five months of care her headaches resolved and she was able return to a normal life style.

**Conclusion:** The formulation of a proper diagnosis and implementing appropriate treatment protocols for the various types of headaches is important. Delay in proper recognition of a specific type of headache may lead to a delay in proper care. In this case of a patient with cluster headaches, the patient responded well to chiropractic intervention. More research on Koren Specific Technique, subluxation reduction and its role in amelioration of headaches is warranted.

**Key Words:** *Chiropractic, subluxation, Koren Specific Technique, headaches, cluster headaches, treatment delays, migraine, International Headache Society.*

### Introduction

Headaches vary widely in terms of severity, frequency, and disability and are one of the most common complaints presenting for medical treatment leading to 18 million office visits per year.<sup>1,2</sup> Headaches may be due to a serious organic disease, neurogenic vascular disorder, or a psychological problem.<sup>3</sup> According to the National Center for Health Statistics, headaches cause an estimated 5.5

million days of activity restrictions per year in the United States. These restrictions cost \$61.2 billion per year in restricted activity and medical expenses.<sup>4</sup> In a report by Moore, the extent of impact that a headache has on a patient's quality of life exceeds other chronic conditions such as osteoarthritis, hypertension, and diabetes.<sup>5</sup>

Joubert states that an orderly and logical approach to headaches needs to be taken in order to avoid misdiagnosis resulting in ineffective treatment.<sup>6</sup> In his report, "Diagnosing Headaches," Joubert divides headaches into four different categories: Primary, Secondary, and Blue and Red flags. Primary headaches are then divided into primary episodic and primary frequent disorders. The primary episodic group consists of migraine, episodic tension type, and cluster headaches. The primary frequent group consists of a transformed migraine, chronic tension, new daily persistent, and hemicranias continua.

Secondary headaches result from disorders arising from the skull, eyes, ears, nose, teeth, cervical spine, intracranial vascular disorders, cranial nerves, intracranial pressure, general infection, and hypertension. Blue flag headaches stem from reading, whiplash, viral infection, and medication. Red flag warnings are new onset headaches, headaches which appear with a rash, neurologic symptoms, postural changes, triggered with coughing and sneezing.<sup>7</sup>

In a retrospective study conducted by Krymchantowski et al a review of 495 records revealed that 357 were female and 138 were male with a mean age of 41.1 years. Headache diagnosis included migraine without aura (43.2%), chronic transformed (40%), cluster headaches (6.5%), episodic tension-type headaches (0.8%), and hemicrania (0.4%).<sup>8</sup>

Experts have suggested that the treatment of headaches needs to be tailored to the diagnosis in order for the treatment and management to be most effective. The International Headache Society (IHS) has suggested a "Headaches Sufferers Bill of Rights", the first point being that a headache sufferer has a right to know his/her headache diagnosis as precisely as possible.<sup>9</sup>

A review of the medical literature conducted by Alix and Bates found that 27% of those reporting a headache have used a form of alternative management. Chiropractic was found to be the most common practitioner-based health care sought.<sup>10</sup> A thorough exploration of the headache history and a physical exam must focus on the neurological component in order to rule out life-threatening traction and inflammatory headache conditions.

These types of headaches can be caused by brain tumors, cerebrovascular accidents, meningitis, and temporal arteritis.<sup>10</sup> These conditions are known as "Red Flag" conditions and emergency medical treatment must be obtained. Another "Red Flag" condition that a chiropractor needs to be able to recognize is an intracranial aneurysm, which is seldom seen in a chiropractor's office (1/10000 Americans annually).<sup>11</sup>

#### *Cluster Headache*

As in our case reported here, every year female headache patients are diagnosed inaccurately which in turn leads to improper and delayed treatment for their headaches. Misdiagnosis of cluster headaches results from confusing

terminology, common presenting symptoms between different forms of headaches, and stereotyping of patients by a practitioner.

Cluster headaches are a primary type headache which has a variety of names: histamine cephalalgia, erythroprosopalgia of Bing, ciliary or migrainous neuralgia, erythromelalgia of the head, Horton's headache, petrosal neuralgia of Gardner, sphenopalatine, Vidian and Sluder's neuralgia, hemicranias periodica neuralgiformis, and suicide headache.<sup>12,13</sup> Clinically, cluster headaches were considered a predominantly male disorder with a 6.2:1 predilection in 1960's evolving to a 2.1: 1 ratio in the 1990's.<sup>14</sup> Cluster headaches are still considered a male predominant condition for unknown reasons. It is thought that cluster headaches could be related to the hormone testosterone. During periods of cluster headaches there is a decrease in testosterone in the male patient. The increased frequency of cluster headaches in women is thought to be secondary to women taking on occupations and male roles. Cluster headaches in women have an earlier onset than their male counter part.

A study conducted by Ekbom found that the female onset was, on average, 25.6 years of age versus male onset at 27.8 years of age. In another study conducted by Manzoni et al, female onset was 23.3 years of age versus males at 29.6 years of age.<sup>15</sup> Cluster headaches are described as excruciating and unilateral and usually accompanied by conjunctival injection and lacrimation.

Pain is always unilateral with pain around the eye and often described as "burning," "boring," or "sharp," and "deep."<sup>14,16</sup> Cluster headaches have two main variants. One is a cluster headache preceded by a classic migraine aura which has been called a "cluster migraine." The other is a cluster headache with separate clusters of attacks of vertigo, tinnitus and deafness as in Meniere's syndrome, and has been labeled "cluster vertigo."<sup>17</sup>

There are many contributing factors that lead to the delay of accurately diagnosing a cluster headache. Cluster headaches are a rare primary headache (6.5%)<sup>6</sup> that mimics other primary type headaches and are not well understood by primary care physicians. Presenting complaints such as nausea, vomiting, and photophobia, are often mistaken for migraine headaches leading to the delay in proper diagnosis of cluster headaches.<sup>19</sup>

Another factor that contributes to the delay in proper diagnosis and treatment is the early onset of the signs and symptoms; the average age of onset in a short report written by van Vliet et al, was thirty.<sup>19</sup> The IHS criteria for cluster headaches stipulate a unilateral pain pattern with cluster pain during an attack remaining unilateral; however, confusion sets in when the pain switches sides between attacks.<sup>17</sup>

Primary headaches, such as tension-type and migraines are incorrectly categorized as "cervicogenic" merely because of their occipital localization. In cluster headaches there is occipital pain reported in more than two-thirds of

the cases, and reported neck stiffness in forty percent of the cases.<sup>18</sup> Myofascial trigger point pain (MTrP) has been found to contribute to tension-type and migraine headaches. Calandre et al conducted a study to determine if MTrPs were a contributing factor in cluster headaches. Although the research is inconclusive at this time, it is their belief that the mechanism underlying the presence of active Trigger Points (TrPs) in each of these headaches are similar. Chronic pain or repeated acute pain and sensitized muscular nociceptors create active TrPs which, in turn, contribute to headache pain.<sup>20</sup>

Knowing the right questions to ask when performing a comprehensive history and physical with a headache patient can direct the clinician towards making a proper diagnosis. First, the duration of a cluster headache is 15 minutes to 3 hours on average.<sup>21</sup> Second, knowing if the patient exhibited one of the cranial autonomic features such as, conjunctival injection, lacrimation, miosis, ptosis, forehead and facial sweating, eyelid edema, rhinorrhoea, or nasal blockage is important. Third, the use of alcohol and nitroglycerine, as well as exercise and elevated environmental temperature are all precipitants to cluster headaches. Allergies, food sensitivities, reproductive hormone changes, and stress have no bearing on cluster headaches. Migraine sufferers prefer not to move around; they prefer to rest in a quiet and dark room with no noise, and their headaches will last four to seventy-two hours on average.<sup>21</sup> Cluster headache sufferers prefer to move around the room or rock in a chair and they also report wanting to bang their head on a wall or bang their head with their fists. Lastly, cluster headache sufferers will wake up during the night, usually between two and four a.m. with a headache.

There is a predominance of cluster headache attacks which occur two weeks following the longest and shortest days of the year in July and January.<sup>22, 21</sup> African American female patients are at greatest risk of misdiagnosis related to gender, ethnicity, and most importantly failure to ask the appropriate cluster headache questions.<sup>14,22</sup> In one study involving five African American women, all five were improperly diagnosed.<sup>22</sup>

Treatment is divided into two groups, symptomatic and prophylactic therapies with variations depending on subtype. Acute episodic cluster headaches are treated with inhaled medication because of its rapid absorption. Inhaled 100% oxygen through a tight fitting mask at seven to ten liters per minute for approximately fifteen minutes has proven to be effective in the treatment of cluster headaches.

The most effective prophylactic medication for episodic headaches is an ergotamine preparation known as ergotamine tartrate.<sup>23</sup> Oral Sumatriptan has also been shown to be effective prophylactically. Verapamil is one of the only drugs used prophylactically that has been studied in a randomized control trial and found to be effective in reducing the frequency of cluster headache attacks. The use of Verapamil carries the risk of hypotension, bradycardia, atrioventricular block, dizziness, fatigue,

nausea, and constipation.<sup>14</sup>

## Case Report

### *Patient History*

The patient is a 47 year old female presenting with a two year history of headaches and neck stiffness that was originally misdiagnosed as migraine headaches. She described her headaches as being right sided, behind her right eye, lasting fifteen to forty-five minutes, occurring five to eight times per day with lacrimation, and without nausea. Prior to, and during each headache, her symptoms also included rolling black spots in her field of vision. There were no associated symptoms between her headache occurrence and her menstrual cycles. She was evaluated by her dentist and her oral health was found to be normal though evidence of bruxism was noted.

A neurological examination was performed and the diagnosis of migraine headaches was assigned. She began standard treatment for migraine headaches which consisted of Imetrix, Maxalt and oxygen, which had mild effects of relief for the patient. After six weeks of non-retractable pain, she was diagnosed with cluster headaches. Standard migraine medications have no effect on cluster headaches. She was then placed on Verapamil, Percocet and Oxygen therapy.

Over the course of the next two years her pain threshold decreased causing her to increase her daily intake of medication to its recommended daily maximum level. After two years of treatment by her primary care physician the patient had reached her maximum daily dose of medication and her break through pain was escalating. With no hope of escaping the vicious cycle of being addicted to pain medication and the thoughts of relentless pain, the patient found herself confronted with thoughts of suicide.

Past history consisted of a fractured clavicle at age three. She was treated with an electrostimulative TENS unit in 1985 for neck stiffness. In 1987 she fell at a water park and fractured her coccyx. Two surgeries were performed: the first for a hernia repair in 1990 and the second consisted of a tubal ligation in 1995. In 1997 she was involved in a rear impact motor vehicle collision while stopped at a red light that resulted in a whiplash injury. She was treated and released from the hospital.

In the beginning of the year, for approximately one minute, she reports that she was blinded for no apparent reason and experienced extreme pain. She also had complaints of constipation, muscle spasms, and difficulties sleeping. Prior to the onset of her headache symptoms there was a self-reported high level of stress in her life. The stressors were related to returning back to school, marriage difficulties, and her mother being diagnosed with cancer.

### *Chiropractic Diagnosis and Treatment*

The patient, in an attempt to control her break through

pain and to reduce the amount of medication being consumed, turned to chiropractic care and received her first chiropractic adjustment using Koren Specific Technique (KST) adjusting protocol. The protocol consists of “challenges, checks, and correction” – otherwise known as the 3 Cs. In short, KST is practiced as follows: After a segment is challenged the occipital bone is checked for an OD. A positive OD indicates that the challenge increased, however slightly, a subluxation. Now a corrective thrust is applied to the segment using the Arthrostim instrument in the opposite direction to the challenge. (See Figure 1 for more detail)

During the course of the correction the Vibracusser instrument is used near the beginning of the adjustment to relax the patient and then again near the middle or towards the end of the adjustment. The use of the Vibracusser allows for a break or time out during the adjustment and helps to relax the patient and their musculature. The Arthrostim instrument is used to administer the adjustment. The Arthrostim moves at twelve cycles per second and delivers the chiropractic thrust. The Arthrostim adjustment was applied for approximately one second to the subluxated segment that needed to be corrected.

The first adjustment was performed with the use of the Arthrostim to subluxations at the C2 and C5 level, the sphenoid bone on the right side for a sphenoid flare, and to the sphenoid frontal suture, as well as the trapezius muscle. Subsequent adjustments over the course of care consisted of adjusting the cranial bones, orbits, sutures, zygomatic arch, hard palate, mandible, pterygoid plate, ribs, and sternocleidomastoid muscle. The patient was seen again on five subsequent visits over a 2 week time frame with similar adjustments being given.

The only additions were the diaphragm, coccyx, and sternum begin addressed. By the end of her 6<sup>th</sup> visit her symptoms were improved and the severity of the headaches had decreased.

Later on in her care her lacrimal, maxilla, and frontal suture junction and her sphenoid, frontal, and parietal suture junction were adjusted. On a visit four months into her care she expressed a desire to decrease her medications and that she felt that the use of her medication's were just a habit at this point.

Following that visit, and after speaking with her primary care physician, she was able to decrease the use of her prescribed Verapamil, Percocet, and oxygen. She reported that she was sleeping better and felt more relaxed. At this time her treatment protocol was decreased to weekly visits. Over the course of the next several weeks there was a steady improvement in the patient's condition.

From the beginning of her treatment the patient reported a significant decrease in the severity of her headache episodes as well as her lacrimation. The patient was able to discontinue the use of all medications within five months and at six months the patient's headaches had

resolved completely. Currently, she reports being headache and drug free, and reports an increase in the quality of her life. She received a job promotion and is now attending college.

## Discussion

The main focus of this case report is proper management beginning with a thorough history, physical exam, and knowledge of the IHS guidelines towards an accurate diagnosis of the precise type of headache. The original IHS guidelines were developed in the 1960s by an ad hoc committee of the U.S. National Institutes of Health and another similar group of experts entitled the Research Group of Migraine and Headache of the World Federation of Neurology. The original guidelines merely listed a few headache disorders. In 1988, a new classification came into existence and provided a much more comprehensive and hierarchical classification system that separated headaches into types and subtypes, both primary and secondary.<sup>24</sup> Misdiagnosis of cluster headaches leading to delays in treatment can result from confusing terminology, common presenting symptoms between different forms of headaches, and stereotyping of patients by a practitioner. African American female patients are at greatest risk of misdiagnosis related to gender, ethnicity, and most importantly failure to ask the appropriate cluster headache questions.<sup>22</sup>

According to a recent survey of complementary and alternative therapy use, chiropractic was frequently selected for the relief of head and neck pain accounting for 18 to 38 million visits annually.<sup>25</sup> One of the latest techniques at the chiropractor's disposal is the KST technique which utilizes the 3 Cs -- Challenge, Check, and Correct in the delivery of the adjustment along with the Arthrostim which is an FDA approved instrument developed by IMPAC technology. The Vibracusser instrument is also used which delivers waves of percussive impulses deep into the tissues of the body for the purpose of muscle relaxation and to improve blood and lymph flow.

The KST analysis is a vitalistic/empirical technique that looks at a biofeedback response and not solely on bony palpation or x-ray.<sup>26</sup> The analysis of bony palpation and x-ray alone ignores the neurological component of the subluxation.

## Conclusion

Chiropractors treat nearly 38 million patients per year with headache complaints. This case report describes a 47 year old female who was originally misdiagnosed with migraine headaches, then treated unsuccessfully for cluster headaches using drug therapy. She then sought chiropractic care and was managed utilizing Koren Specific Technique. Continued research on the role of chiropractic and subluxation reduction for headache sufferers is recommended.

## References

1. Bolin PD, Kassak K, Bronfort G, Nelson C, Anderson AV. Spinal manipulation vs. amitriptyline for the treatment of chronic tension-type headaches: a randomized clinical trial. *J Manipulative Physiol Ther* 1995 Mar-Apr;18(3):148-54.
2. Bronfort G, Assendelft WJ, Evans R, Haas M, Bouter L. Efficacy of Spinal Manipulation for Chronic Headaches: A Systematic Review. *J Manipulative Physiol Ther* 2001 Sep;24(7):457-66.
3. Atkinson R, Appenzeller O. Headache. *Postgrad Med J*. 1984 Dec;60(710):841-46.
4. Crawford CC, Huynh MT, Kepple A, Jonas WB. Systematic Assessment of the Quality of Research Studies of Conventional and Alternative Treatment(s) of Primary Headaches. *Pain Physician* 2009; 12:461-70.
5. Moore M. Upper Crossed Syndrome And Its Relationship To Cervicogenic Headache. *J Manipulative Physiol Ther* 2004;27(6):414-20.
6. Joubert J. Diagnosing headaches. *Aust Fam Physician* Aug;2005;34(8):621-25.
7. Jrymchantowski AV, Adriano MV, de Goes R, Moreira PF, Jevoux Cd. Adherence to Headache Treatment and Profile of Previous Health Professional Seeking Among Patients with Chronic Headache: A Retrospective Analysis. *MedGenMed* Apr.2007; 9(2): 21.
8. O'Flynn N, Ridsdale L. Headache in primary care: how important is diagnosis to management? *Br J Gen Pract*. 2002;52:569-73.
9. Alix ME, Bates DK. A Proposed Etiology of Cervicogenic Headache: The Neurophysiologic Basis and Anatomic Relationship Between the Dura Mater and the Rectus Posterior Capitis Minor Muscle. *J Manipulative Physiol Ther* 2009;22(8):534-39.
10. Peters KS. Headache-Diagnosis and Effective Management [Topics in Primary Care Medicine]. *Wes J Med*, June 1984;140:p957-60.
11. Larkin-Their SM, Livdans-Forret, Harvey PJ. Headache Caused By An Intracranial Aneurysm in A 32-Year Old Women. *J Manipulative Physiol Ther* 2007;30:140-43.
12. Torelli P, Castellini P, Cucurachi L, Devetak M, Lambro G, Manzoni GC. Cluster headache prevalence: methodological consideration. A Review of the literature. *ACTA BIOMED* 2006;77:4-9.
13. Leroux E, Ducros A. Cluster Headache. *Orphanet J Rare Dis*. 2008;3:20.
14. Beck E, Sieber W, Trejo R. Management of Cluster Headache. *Am Fam Physician* 2005;71:717-24,728.
15. Rozen TD, Niknam RM, Shechter AL, Young WB, Silberstein SD. Cluster headache in women: clinical characteristics and comparison with cluster headaches in men. *J. Neurol. Neurosurg. Psychiatry* 2001;70:613-17.
16. Gallagher MR. Headache Pain. *J Am Osteopath Assoc* Sept. 2005;105(4):7-11.
17. Pearce JMS. Cluster headache and its variants. *Postgrad Med J* 1992;68:517-21.
18. Pollmann W, Keidel M, Pfaffenrath V. Headache and the cervical spine: a critical review. *Cephalgia* 1997;17:801-16.
19. van Viet JA, Eekers PJE, Haan J, Ferrari MD. Features involved in the diagnostic delay of cluster headaches. *J Neural Neurosurg Psychiatry* 2003;74:1123-25.
20. Calandre EP, Hilalgo J, Garcia-Leiva JM, Rico-Villademoros F, Delgado-Rodriguez A. Myofascial trigger points in cluster headache patients: a case series. *Head Face Med* 2008;4:32.
21. Kernick D, Matharu MS, Goadsby PJ. Cluster headache in primary care: unmissable, underdiagnosed, and undertreated. *Br J Gen Pract*. 2006 July 1; 56(528): 486-487.
22. Wheeler SD, Carrazana EJ. Delayed Diagnosis of Cluster Headache in African-American Women. *J Natl Medl Assoc*. 2001;93:31-36.
23. Agnew DC. Treatment of Cluster Headaches. *West J of Med*. July 1991;151:66-67.
24. Olesen J, Steiner TJ. The international classification of headache disorders, 2<sup>nd</sup> edn (ICDH-II). *J Neurol Neurosurg Psychiatry*. 2004;75:808-11.
25. Haas M, Group E, Aickin M, Fairweather A, Ganger B, Attwood M, Cummins C, Baffes L. Dose Response For Chiropractic Care of Chronic Cervicogenic Headache and Associated Neck Pain: A Randomized Pilot Study. *J Manipulative Physiol Ther* 2004;27:247-53.
26. Koren T. Empirical, Expression, Vitalistic: A breakthrough in healthcare. Hatfield, Pa: Koren Publications; 2008.

## Figure 1: Koren Specific Technique Description

### *Challenge*

If a body part is subluxated, any movement of the part that intensifies the subluxation (i.e. a vertebrae that is subluxated spinous process left is pushed further left) will cause stress to the body and elicit a stress reaction which we observe in KST as an Occipital Drop (OD) – the occipital bone appears to drop a little lower on the left as a result of the challenge. We refer to that as a positive reaction or a positive challenge. If a body part is pushed, pulled, or otherwise moved in a way that lessens or has no effect on the subluxation there will be no OD and it is therefore a negative reaction

The OD is one of many observed stress reactions the body elicits when a subluxation is increased or “challenged” and many of these reactions are a part of common clinical use today. These reactions include those in Applied Kinesiology (AK) wherein a muscle weakens in response to a positive challenge, the short leg reflex in which a leg will appear to shorten in response to a positive challenge (as is used in DNFT and Activator ® technique. An increase in sweating resulting in an increase in resistance when running one’s hand over a smooth surface (as is used in Toftness ® technique, and a temporary cessation of the cranial sacral rhythm or “still point” (as is used in CranioSacral Therapy ®. There are other such stress reactions used by different health care systems.

### *Check*

The check used in KST is an analysis using the occipital bone. It has been observed in KST that the occipital bone will drop inferiorly if there is a subluxation present when a challenge is applied to any bony structure within the skeleton. This portion of the analysis is called the occipital drop and is used as a detection procedure checking for subluxations. The practitioner slides his/her hands down the back of the head with his/her thumbs facing. The thumbs are gently slid inferior from the posterior parietals to the occipital shelf. A negative reaction is when the thumbs remain level (no OD). A positive reaction is when, for example, the left thumb appears to slide a little lower than the right thumb (OD). This is an empirical observation, much the same as the above stress reactions utilized in other techniques in chiropractic and other forms of manual therapy. We do not know the mechanism at this time.

The OD may have certain advantages in its analysis. First, there is no muscle fatigue as might occur in muscle testing techniques. Secondly, it is fast and may be an accurate analysis. Finally, the patient can be placed in many different postures in order to use the analysis - such as standing, sitting, bending, and in the position or posture of subluxation. After the segment is challenged the occipital bone is checked for drop and a positive OD indicates an area of stress to the challenged segment and a corrective thrust is applied using the Arthrostim instrument.

### *Correct*

The correction is made by introducing a force or energy in the opposite direction to the positive challenge. The Arthrostim instrument is applied to the subluxated bone/segment and a mechanical thrust is introduced at 12 taps per second for approximately one second. The advantage to using the Arthrostim is that it is very specific to the bone, disc, or suture that is being adjusted. The force can be modified while working with the patient.

In short, KST is practiced as follows: After a segment is challenged the occipital bone is checked for an OD. A positive OD indicates that the challenge increased, however slightly, a subluxation. Now a corrective thrust is applied to the segment using the Arthrostim instrument in the opposite direction to the challenge.