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Letter from the Editor in Chief

This issue concludes our 7th year in publication. We have grown from a vague idea in the minds of two old examiners pontificating in a stinky exam hotel room late one night to one of the health community's leading on-line works. We have become a genuine collaboration of great minds. It would be quite insincere of me to take credit for this advance for I know full well the variety of contributions that has made this happen. We are very fortunate to have had so many great professional minds come forward to help us. Without them, we would not be reveling in our success. I love to revel, at least for a second or two. Then, as with most of us, the reality comes forward in our minds and we get back to work; realizing that although it looks like we have done a great work looking back, our prospective must be forward and the great work is yet to come.

But for a moment, I like to reflect on the wonderful friendships fostered by working on such a noble project. With the family holidays of Thanksgiving, Christmas, Hanukah, New Years and others all around us, I can't help but become reflective. Take a minute with me now and refer back to the list of editors. As I peruse the list, I think of each individual for just a moment. I think of the first time we met and the exchange. For some, it was an in-person meeting and for others on the list, it has only been an exchange of email. The lack of face time notwithstanding, I feel as if I have grown to know each member of the crew. This is certainly a great time of year to reflect on these wonderful thoughts. From the top of list to the alphabetically challenged last I have fond appreciation for each.

So as we look ahead, we can have great pride in the path we are pursuing. We can thank those who have gone before and sacrificed so much for us that we might be here, now with such great destiny. I recall the words of one of my mentors, Dr. Joseph Janse who said to me one night at his home as I was leaving for a dinner date with his daughter, "A lot of folks are depending on you bub." I thought then it was a typical father wanting to insure the safety of a daughter. I'm sure there was some of that but he sent a message in his subtle appearing way that I have never forgotten. Indeed, a lot of folks are depending on us. They are depending on us to deliver advice in the acquisition of health and not just in the business of health care delivery. Our products in this journal are so designed.

Finally, I wish each of you the good fortune to realize the satisfaction that comes with providing pertinent and accurate information to help others achieve better health.

Bruce Gundersen DC, FACO
Editor-In-Chief
Journal of the Academy of Chiropractic Orthopedists

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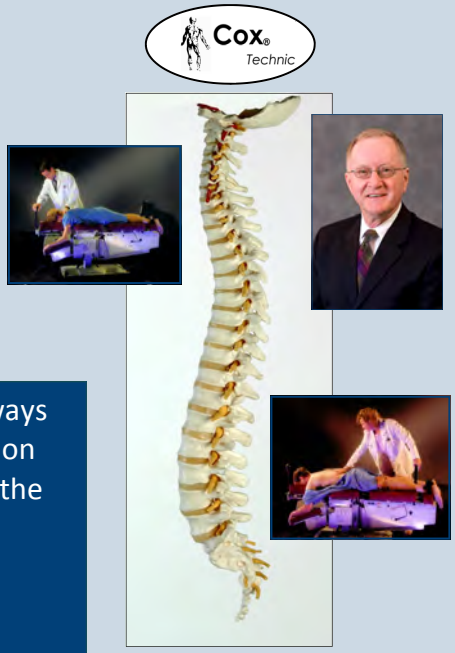

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Image Gallery

Image Gallery

The Image Gallery is dedicated to the artistic contributions of our readership. The ***Journal of the Academy of Chiropractic Orthopedists*** invites you to submit drawings, illustrations, or photographs, along with appropriate explanatory information, for consideration of publication within this section. Please forward electronic media via the following Articles Submission hyperlink: aco@dcorthoacademy.com.

West Coast of Maui, Hawaii

This humpback whale was observed off the west coast of Maui, Hawaii. It was about 75 yards from the boat and the waves after the splash rocked the boat. These whales come to the Hawaiian Islands from November to April to give birth to their babies and enjoy the warm waters.

Submitted by: James R. Brandt, DC, MPS, FACO

Original Article

Case Study: Tarsal Tunnel Syndrome

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Abstract

Background: A case is presented related to the assessment and chiropractic management of Tarsal Tunnel Syndrome.

Methods: A 51 year old male presented with a five year history of intermittent numbness in his left foot on the medial aspect. The patient described that his left leg would, "stop" and "freeze", and he had diminished control over his gait. Chiropractic assessment and care were initiated.

Results: The patient responded favorably after three sessions of chiropractic care.

Conclusions: In this case, chiropractic care provided substantial relief for a patient presenting with tarsal tunnel syndrome.

Case Presentation

The patient presented with a five year history of numbness in his left foot and left side and "gait freeze". He described a tingling and numbness primarily underneath his left foot when he is walking or standing. He reported no lower back pain. When he is walking he suddenly will feel like the left leg will "stop and freeze" like he does not have good control. His symptoms have been getting worse. It can start after just a few seconds of walking. When the symptoms start, it feels like he is walking on a sponge. The intensity of the pain can be of such intensity it feels like his knee is going to buckle. Sitting and lying down ease his symptoms. No complaints of night pain were given. He had seen his primary care physician and a neurologist for these complaints. He was checked for upper motor neuron (UMN) disease. This included two MRI's of the brain, which were both unremarkable. It was thought that he had the start of Parkinsonism, but it was never substantiated. He asked if the problems could be in his leg and was told "that was unlikely". He has tried on his own to stretch his leg, but that hasn't helped him. His health history includes hypothyroidism and asthma. Medications are being taken for these conditions.

His examination included the vital signs, all findings were unremarkable. His lumbar range of motion was essentially normal and carried out without pain. Knee and ankle ranges of motion were unrestricted. DTR's were +2 (0/+4 scale) bilaterally. No motor or sensory changes were noted and he has equal muscle strength bilaterally.

Heel-toe-walk was negative. Straight leg raising (SLR) was negative to 90° bilaterally. Anthropometric leg length measurement was equal bilaterally. Multiple myofascial trigger points (MFTP's) were present in the soleus, gastrocnemius and the anterior tibialis on the left side. Tinel's just below the medial malleolus was positive. The trigger points contributed to his clinical findings. They contributed discomfort into the foot, but did not exactly duplicate the feeling he has while walking.

Diagnosis and Treatment

The findings are classic for Tarsal Tunnel Syndrome. The initial treatment included mobilization of the ankle including the talus and calcaneus, underwater ultrasound posterior and inferior to the medial malleolus, electrical muscle stimulation (EMS) to the lower leg muscles, manual therapy to the MFTPs and figure 8 taping for arch support. The tape was to be left on for two days. The patient felt immediate relief and the symptoms continued to improve by the second visit. Orthotics were recommended at that time. Office treatment remained the same on the second visit. By the 3rd visit, the patient commented, "this is the best I have felt in years". Orthotics were placed in his shoes and ankle exercises were provided. His office treatment remained the same except no supportive taping was done. He was counseled about activities of daily living (ADL) and what to do if his symptoms return.

Discussion

Understanding the possibilities of non spinal causes of numbness or symptoms need to be included in every patient work-up with extremity complaints. The patient commented that not one of the previous clinicians evaluated his lower back or the lower extremities.

The tarsal tunnel is a fibro-osseous structure posterior to the medial malleolus and formed by the flexor retinaculum, which originates from the tibia and inserts onto the posterior process of the calcaneus and talus laterally. The retinaculum blends with the sheaths of the posteior tibial tendon, flexor digitorum longus tendon, posteior tibial nerve/artery and flexor hallucis longus tendon. (3)

Symptoms of tarsal tunnel syndrome as described by Keck and Lam (1) can include numbness, burning, tingling in the toes or the soles of the foot; nocturnal awakening with the foot tingling; worsening of symptoms as the day goes on and cramping in the foot. Protocols for the diagnosis of tarsal tunnel syndrome can be established by the presence of three diagnsotic indicators: (a) pain in the heel, forefoot and mid-foot; (b) a positive Tinel's sign at the tarsal tunnel and (c) abnormal nerve conduction study of the medial plantar and lateral plantar nerve or any combinaton of the two nerves. (4)

Only the posterior tibial artery and veins occupy the tarsal tunnel with the poterior tibial nerve. (1) It is important to realize that there are other causes of tarsal tunnel complaints. In additoin to nerve entrapment, diabetic polyneuropathy, space occupying tumors, ganglion, pes palnus, rheumatiod arthritis, residual from ankle fracture, tensysnovitis of the posterior tibial tendon and tarsal coaliton can contribute to tarsal tunnel complaints. (1,2,3) There are serious conditions as mentioned, which could contribute to these symptoms. If your patient is not responding quickly to your care and management, further investigation is warranted.

Competing Interests

The author does not have any competing interests.

Acknowledegements

The author would like to acknowledege the mentors of the Academy of Chiropractic Editorial Review Board for their help on this first attempt of writing a case report.

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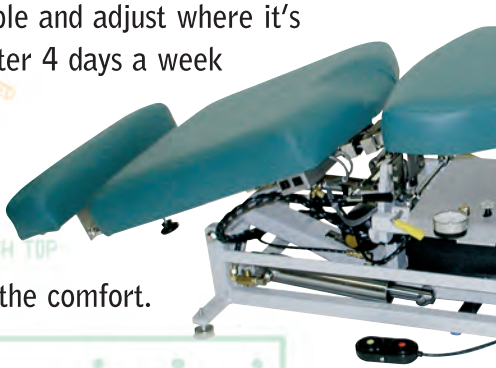

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Original Article

Second Occurrence of L4-5 Free Fragment Resorption Following Chiropractic Distraction Manipulation

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History

On July 12, 2010 the patient presented with left lateral leg and ankle/foot pain and numbness. The patient is a 44 year old female vacationing in Alaska from July1-10, 2010. During this time she went on two all day charter fishing trips and experienced a lot of jarring and bouncing motions due to 10 foot waves. Sitting was especially traumatic because she would rise up out of her seat and was then forcibly pounded back into her seat by the wave action. Following this activity she endured over 1300 miles driving and riding in a rented vehicle to see other sites of Alaska.

On presentation she was unable to sit longer than a few minutes before the severe (9/10) ~~ic~~e-cream headache" type pain in the left gluteal, lateral leg and foot began to intensify. She stood up several times during the history and would pace the room until her symptoms abated.

Her past medical history reveals a previous L4-5 caudally extruded posterolateral disc herniation in 2005 that resorbed with distraction manipulation within 8 weeks of onset. No other part of her history would be considered contributory.

Examination

Lower extremity deep tendon reflexes were normal. Straight leg raising slightly intensified her left leg pain. Seated Kemps did not significantly alter her leg pain. Her left great toe was weak and was graded as a 2/5. The patient's dorsolumbar range of motion was within normal limits and did not intensify her leg pain. Dejerine triad was negative.

Treatment

With her past history of an L4-5 extruded disc herniation and current findings of great toe weakness and pain with numbness along the L5 nerve distribution I concentrated my treatment on the L4-5 disc and left Piriformis muscle. For the initial 2 weeks of treatment I used distraction manipulation at the L4-5 disc level, 90 pounds of lumbar traction, Interrupted Galvanic current with the pads placed over the L4-5 disc, left piriformis muscle, popliteal fossa, and lateral calf. I would also administer acupuncture for pain control. She was treated daily for the first two weeks.

She was not responding favorably to care so on August 9, 2010 a lumbar MRI was ordered. The lumbar MRI was performed at the Center for Diagnostic Imaging and revealed the following:

- L5-S1: Moderately advanced disc degeneration, with disc space narrowing increasing since 12/21/2005. There has been resorption of a 2-3mm AP right posterolateral herniation, with persistent dorsal annular bulging and retrolisthesis and mild narrowing of the subarticular recesses, without neural impingement. Chronic up-down left foraminal stenosis has increased from mild to mild-moderate, with mild right foraminal stenosis new since 2005.

- L4-5: Moderately advanced disc degeneration has progressed slightly since 12/21/2005, with increase in disc space narrowing. A recurrent 5-6 mm AP x 15mm transverse x 12mm SI caudally extruded left posterolateral herniation and bulge are present, with similar extrusion seen on 10/28/2005, but resorbed by the exam of 12/21/2005. Extrusion now markedly narrows the left subarticular recess, impinging upon the traversing, subarticular left L5 root and also medial to the left L5 pedicle. There is mild underlying central and bilateral subarticular recess narrowing and abutment of the intrathecal right L5 root and mild caudal right foraminal narrowing is noted.

The interpreting radiologist was Timothy Mick, DC, DACBR. See figures 1 and 2.

Figure 1. T2 weighted Sagittal Image of the Lumbar spine. The image reveals a recurrent 5-6 mm AP x 15 mm transverse x 12 mm caudally L4-5 extruded left posterolateral herniation.

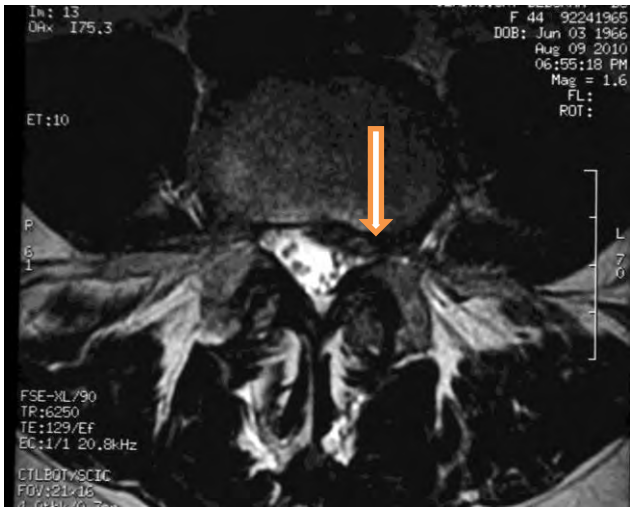

Figure 2. T2 weighted axial image of the lumbar spine revealing a left posterolateral herniation narrowing the subarticular recess.

Her treatment remained the same following the MRI but I restricted her activities and lowered her weight restrictions. By September 1, 2010 she reported to me that she was totally asymptomatic and that even the leg numbness was gone.

I contacted Dr. Mick at CDI and requested a limited study be performed to determine whether or not the extruded fragment had resorbed. The following is the interpretation of the follow up MRI performed on 9/9/2010.

Figure 3. T2 weighted sagittal image. This image reveals significant partial resorption of the large, caudally extruded left posterolateral herniation at L4-5.

Follow-up Minimal Study MRI Conclusion:

Significant partial resorption of the large, caudally extruded left posterolateral herniation at L4-5 since 8/9/2010, with associated decrease in the degree of left subarticular recess narrowing and mass effect on the traversing left L-5 nerve root. See Figure 3. No other significant interval change.

Discussion

The resorption of extruded disc material has been well documented previously in the literature. I wrote this article because of the uniqueness of having two caudally extruded disc herniations at the same level and both resorbing within weeks of their onset. In my initial article titled "Free Fragment Resorption at L4-5 Following Chiropractic Treatment" which was published in JACO last year, I have a discussion section in which I review articles by Cowan et al, Ahn et al and Maigne et al which I will not duplicate.

Conclusion

It is apparent from the literature that there are several factors which may determine if an extruded disc herniation may resorb. (1) When the disc material is located in the epidural space[3], which is an area of greater vascularization triggering an assault on this "foreign body" by the macrophages. (2) The herniations with the greatest tendency to resorb were larger herniations[3]. (3) 79% of all transligamentous herniations and 100% of all sequestered herniations were reduced in size[2].

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Acknowledgements

Written informed consent was obtained from the patient for publication of this case report and for the

use of accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal. Advanced Imaging was performed at the Center for Diagnostic Imaging (CDI) in Mendota Heights, Minnesota.

Jerrold R. Wildenauer, DC, FACO

Original Article

Chiropractic and Physical Therapy Co-management of Chronic Traumatic Sternocleidal Joint Dislocation: A Case Report

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Abstract

Introduction

This paper presents a case report of conservative co-management of a traumatic sternocleidal joint subluxation in an integrated veterans' hospital setting.

Case Report/Methods

A male patient with a chronic traumatic sternocleidal dislocation is treated conservatively utilizing chiropractic manipulation and physical therapy. The patient's pain was measured utilizing a Numeric Rating Scale. Manipulation was performed utilizing an instrument and was a manual force that was mechanically assisted. Physical therapy consisted of both therapeutic modalities and exercise prescription including cryotherapy, electric stimulation, exercises and stretches.

Results

The patient had substantial improvement in joint function, activities of daily living, and quality of life. His pain dropped from 7-8/10 to 0 /10 over ten weeks.

Discussion

This case contributes another method to treating traumatic sternocleidal subluxations, especially chronic ones where the other methods (surgery, towel clamp) would be too painful or not indicated. In this case it was shown to be effective in improving patient symptoms, quality of life, and joint function, and was tolerated well.

Background

The sternoclavicular joint is the least dislocated nonaxial major joint in the human body [1]. It is most commonly injured in motor vehicle accidents or sports-related trauma. [1] As with injuries to the acromioclavicular joint, the sternoclavicular joint may be injured by a direct or indirect mechanism. A direct mechanism may involve trauma or impact to the medial clavicle, which can cause a posterior dislocation of the sternoclavicular joint. Indirect injuries result from medial compression of the entire shoulder girdle. The position of the shoulder

determines the direction of the dislocation. [2] Chronic unreduced posterior dislocations can cause symptoms of delayed onset including: post-traumatic thoracic outlet syndrome, brachial plexopathy and exertional dyspnoea.[3] In an acute setting closed reductions have been successful 80% of the time [1] and have been shown to be successful up to 4 days after the injury.[4] This is normally accomplished through traction of the arm, and direct traction on the clavicle utilizing a towel clip, although new techniques have been developed which do not require a towel clip.[5] This case presents another manual technique for closed reduction and documents clinical management in a chronic case approximately 2 years removed from the date of injury.

Case Presentation

The patient is a 40 year old male veteran referred for physical therapy by his primary care provider. He complained of bilateral shoulder pain, left anterior chest and rib pain, and painful, difficult breathing. He had fallen from a truck approximately two years earlier.

Upon physical assessment, the physical therapist noticed the proximal end of the veteran's left clavicle was markedly more posterior compared to the opposite side. To confirm their suspicion the physical therapist contacted the chiropractic clinic for a second opinion regarding the diagnosis of S-C subluxation. The chiropractor confirmed, through observation, static palpation and motion palpation of the sternocleidal joints, that the proximal end of the left clavicle was grossly posterior to its expected position and noted that it was also inferior to that position. Altered active, passive and fluid motion of the sternocleidal joint were observed, compared to the opposite side. A marked increase in inferior motion of the proximal end of the left clavicle on abduction of the left arm was also noted by motion palpation as compared to the other clavicle. The veteran's sternocleidal joint, rather than subluxing or luxing anterior and superior, had subluxed or luxed posterior and inferior.

Chiropractic techniques currently used for the sternoclavicular joint are only applicable to anterior-superior misalignments. The physical therapist and chiropractor therefore collaborated to adapt a manipulative technique used for posterior and inferior sternocostal lesions to treat the veteran's condition.

The physical therapist abducted and extended the veteran's left arm in order to open the left costosternal and sternocleidal joints. The chiropractor then utilized an Impulse thrust adjusting instrument (NeuroMechanical Innovations) at the inferior aspect of the clavicle to perform a manipulation with an inferior to superior line of drive and as much posterior to anterior drive as the patient's ribcage morphology permitted.

Following this maneuver, the chiropractor, in response to static and motion palpation findings, manipulated the thoracic and cervical spine utilizing standard diversified protocols. Following the manipulation, the physical therapist employed cryotherapy, electric stimulation, exercises and stretches in an effort to control inflammation, enhance core stabilization of the upper quarter, and correct the aberrant motor engram that had developed following the injury.

The patient was seen eleven times for manipulation and physical therapy over ten weeks with substantial improvement in joint function, activities of daily living, and quality of life. His pain dropped from 7-8 with activity to 0 on a 0-10 scale. He reported that he had less difficulty breathing, and resumed aerobic exercise.

Conclusions

It is important to note that in this case the patient did not have symptoms of mediastinal compromise which is something that must be ruled out in an acute injury. This new method is also most applicable to a subluxation/dislocation which is primarily inferior although posteriority is addressable with this protocol. The use of bolsters or sandbags between the scapulae of the supine patient may also facilitate this maneuver. With the multiple vectors and rotational aspects of movement, as well as the numerous possible morphologic differences in patients, it is important to select the right technique, and tailor it to the specific situation and patient. This technique could be desirable as well because of the controlled high velocity low amplitude thrust, the easy vectoring, and the repetitive impulse. These allow changes to be precise and metered while loading the soft tissue and moving the anatomic elements efficiently and with a minimum of secondary tissue interaction.

Consent

Written consent for publication was obtained from the patient or their relative.

Acknowledgements

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Competing Interests

The author declares that he has no competing interests

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Abstracts & Literature Review

Congenital Osseous Anomalies of the Upper Cervical Spine

Harish S. Hosalkar, MD, MBMS (Orth), FCPS (Orth), DNB (Orth); Wudbhav N. Sankar, MD; Brian P. D. Wills, MD; Jennifer Goebel, BA; John P. Dormans, MD; Dennis S. Drummond, MD

J Bone Joint Surg AM. 2008; 90: 337-48.

JACO Editorial Reviewer: Stanley N. Bacso, DC, FACO, FCCO(C)

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Authors' Abstract:

Background: The developmental anatomy and biomechanics of the upper cervical spine are unique in children. Congenital osseous anomalies in this region may be associated with an increased risk for subsequent neurological compromise from instability and/or spinal cord encroachment. We performed a double-cohort study evaluating congenital osseous anomalies of the upper cervical spine in children who presented with one or more clinical problems, and we attempted to outline the risk of possible neurological compromise.

Methods: We reviewed the medical records and imaging studies of all children seen and treated for osseous anomalies of the upper cervical spine at our institution between 1988 and 2003. Patients were divided into two cohorts on the basis of the presence or absence of associated syndromes. Parameters reviewed included demographic data, clinical presentation and imaging features. All anomalies involving the central nervous system, the occipitocervical junction, and the upper cervical osseous canal were included. Complicating sequelae such as canal stenosis, segmental instability and other anomalies of the central nervous system and spine were identified.

Results: Sixty-eight consecutive children were identified. Twenty-one patients had underlying described syndrome. There were 234 osseous anomalies (average 3.4 per patient). Three or more anomalies were noted in 79% of the patients. There was no significant difference in the mean number of anomalies (P= 0.80) or in a frequency of any specific anomaly ($p > 0.20$ for all) between syndromic and non-syndromic patients. A variety of clinical presentations included neck pain (twenty-six patients), neurological changes (twenty-one patients), and torticollis and/or stiffness (twenty-one patients). Twenty-three patients had more than one complaint. Six patients had isolated spinal instability, twenty-eight had isolated spinal cord encroachment and six had a combination of both. Forty-four (65%) of the sixty-eight patients underwent surgical decompression and/or arthrodesis principally focused from the foramen magnum to the second cervical vertebra

Conclusions: As a result of these findings, we recommend a thorough evaluation and advanced imaging of the upper cervical spine in all children

who present with symptoms related to the upper cervical spine, to identify associated anomalies in further define the nature of canal encroachment including any potential for neurological compromise.

Level of Evidence: Prognostic - Level III

Background Information

The developmental and embryological anatomy in the human upper cervical spine is unique as compared to the rest of the vertebral column. This is because the occiput, atlas and axis are formed by separate mechanisms from that responsible for other vertebral body development[1, 2]. This region is defined as extending from the occiput to the C2-C3 disc space[3]. It is also commonly referred to as the craniovertebral junction.

Specifically, four sclerotomes contribute to the structural design of the C0-C1-C2 complex. Segmentation of somites surrounding the notochord and neural tube begin in the third to fourth week of gestation. Ossification centers develop in cartilaginous clefts around the second year of life, and the posterior arch of atlas is typically ossified by four years old; however, complete ossification of the odontoid process (dens) can occur as late as 12 years of age[4, 5].

Common anomalies such as Arnold-Chiari formation, 22q11.2 Deletion (DiGeorge) syndrome, basil invagination, occipitalization of the atlas, dysmorphic dens, os odontoideum, intersegmental fusion and spinal canal stenosis can affect the segmental stability of the atlantooccipital and/or atlantoaxial articulations[1, 6, 7].

The purpose of this study was to determine:

1) How children with congenital osseous anomalies of the upper cervical spine present to clinician

2) Upper cervical anomalies present in syndromic and nonsyndromic patients

3) Relationship between anomalies and the development of instability and/or spinal cord encroachment with neurological sequelae

Pertinent Results

- Of the 68 children with congenital osseous anomalies evaluated in this study, 21 were in the syndromic group and 47 were in the nonsyndromic group

- The most common clinical features were: neck pain (26 patients), torticollis/neck stiffness (21 patients) and neurological changes (21 patients)

- Neurological manifestations at presentation were strongly associated with the need for surgical intervention

Conclusions / Clinical Applications

- The embryological manifestations in these anomalies likely arise during somatogenesis where errors occur in cellular proliferation, migration, differentiation and segmentation in and around the craniovertebral junction have an important association with the development of neurological sequela[8, 9, 10].

- Neurological signs and symptoms including long track and posterior columns signs, ataxia, nystagmus, headache, neck pain and audiovisual symptoms were frequently observed. These were similar to observations in craniovertebral anomalies dating back to the 1960s[11].

- Craniovertebral abnormalities have been associated with congenital syndromes, skeletal dysplasias and metabolic conditions.

- Biomechanical factors at the craniocervical junction play a large role with regard to injury in children. By adding congenital spinal anomalies such as encroachment of available space for the spinal cord/brainstem, the risk for neural injury might be increased[1].

- The encroachment concept has helped to better evaluate and explain the individual's clinical manifestations, and develop a program for management.

- The authors developed an algorithmic approach to the investigation and management of patients with osseous anomalies at the craniovertebral junction as follows:

    i. Define encroachment of the space available for the spinal canal as ~~"s~~static" or ~~"d~~ynamic" - or a combination of both. Atlantooccipital (C0-C1) instabilities are best initially evaluated on extension radiographs, and atlantoaxial (C1-C2) instability are best visualized on flexion radiograph.
    ii. With asymptomatic patients, analyze dynamic radiographs to identify segmental instability and/or encroachment
    iii. if dynamic studies are within normal limits, usually the patient can be managed with observation and monitoring
    iv. if marginal (or greater) instability is present, magnetic resonance imaging can assist in determining whether instability is associated with substantial risk for neurological injury
    v. in patients with clinical symptoms *and* temporary or persistent signs of myelopathy, appropriate surgical intervention is often the most prudent course of management

Study Strengths/Weaknesses

Level III - systematic review of case studies. The weakness of such studies is that there is some evidence without a high degree of reliability or correlation. Typically, Level III studies are systematic reviews, case-controlled or cohort studies.

In my opinion, the authors presented a balanced summary of the case studies integrating it well with the existing literature. They advanced a model with respect to the identification and clinical management of congenital anomalies of the upper cervical spine.

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Abstracts & Literature Review

Effects of Insomnia and Sleep Medication on Health Related Quality of Life

Taeko Sasai, Yuichi Inoue, Yoko Komada, Takashi Nomura, Masato Matsuura and Elsuke Matsushima

Sleep Medicine Volume 11, Issue 5, 5;10:452-457.

JACO Editorial Reviewer: James R. Brandt, DC, MPS, FACO

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Authors' Abstract:

Background: This study was undertaken to assess the effects of insomnia and sleep medication use on quality of life (QOL) in 2822 people (ages 20-97) in a rural population. Factors associated with deterioration of the mental component summary (MCS) score and physical component summary (PCS) score were investigated. Insomnia is a well known as a common disorder with a prevalence of about 20% among the general population. Major symptoms of insomnia are poor nocturnal sleep and impaired daytime functioning during wakefulness. Reports describing clinical populations show that patients with chronic insomnia commonly complain of subjective daytime impairments including mood disturbances, concentration problems, elevated fatigue and sleepiness. Regarding objective daytime impairments, these patients show impairments in tasks evaluating vigilance, working memory and motor control. These various daytime dysfunctions attributable to insomnia are presumed to degrade the quality of life. It was found that sleep medication for insomnia is used by 5-8% of the general population. The occasional use of sleep medication is 3-11%.

Methods: Questionnaires requested information from 2521 men and 3007 women over 20 years of age. The information requested included family circumstances, existence of family members who need home-based nursing care, existence of any currently treated disease, smoking and drinking habits. The SF-8, Pittsburg Sleep Quality index (PSQI) and Center for Epidemiological Studies Depression Scale (CES-D) were used.

Results: The sample comprised of 1222 men and 1600 women with a mean age of 57.4 (range 20-97 years). Comparisons between the MCS score and the PCS scores of the insomnia group, those using sleep medication (n=365) and the group of good sleepers were significant. The insomniac group showed a significantly lower MCS and PCS scores than the good sleepers group.

Conclusions: The more severe the insomnia symptoms were, the worse the QOL. It was also

found that age and depression are associated with the deterioration of physical QOL and Mental QOL. Being a woman and the presence of a family member needing home based nursing care were also associated with lower mental QOL. Poor sleep issues have been described as affecting blood pressure, glucose intolerance and immunological dysfunction. The most remarkable finding of this study was the different influences of sleep medication use on mental QOL and physical QOL. The findings in this study imply that the frequency of sleep medication use adversely affects both physical QOL and mental QOL.

JACO Editorial Summary:

- This study is relevant to the care and treatment of patients complaining of neuromuscular complaints (NMS).
- Quality of life issues (QOL) is a daily discussion with patients in chiropractic offices.
- This study brings to the forefront exploring other issues of chronic pain in our patients that do not seem to respond, have appeared to be "doctor shopping" or at least a lengthy history of multiple doctor visits. It should be investigated as it is more than likely their sleep history has not been explored. Sleep issues may be a causative factor in their NMS complaints.
- Poor quality of sleep creates danger in the work place and driving (motor control). It also reduces the ability of workers, students (memory) and people to function with activities of daily living (ADL).
- Doctors of Chiropractic, as part of the examination process, should be utilizing instruments such as the Pittsburgh Sleep Quality Index (PSQI) or the Epworth Sleep Index (ESI) with chronic pain patients.
- This study did not consider the use of sleep surfaces, room temperature, food intake and activities prior to sleep. All of which could have a negative result when trying to fall asleep or during sleep. As clinicians, we need to bring these questions to the patient.
- Sleep physiology and its effects on the patient is now just getting a foothold in patient care. Treating clinicians need to be educated on the ramifications of poor sleep and its adverse effects on the body.

Abstracts & Literature Review

Anatomic Study of the Suboccipital Artery of Salmon with Surgical Significance

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JACO Editorial Reviewer: Anthony V. D'Antoni, MS, DC, PhD

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Summary for *JACO*

The hallmark of a board-certified chiropractic orthopedist is not only advanced knowledge of evidence-based treatments and protocols, but also basic anatomic knowledge. Anatomic research is ongoing and can still give us insight into the fabric of the human body. My research group has recently published a paper on the suboccipital artery of Salmon, a topic that highlights the clinical relevance of the angiology of the V3 segment of the vertebral artery (D'Antoni, Battaglia, Dilandro, & Moore). This study will be of interest to chiropractors and others who treat disorders of the cervical spine.

The importance of the anatomy of the vertebral artery in relation to cervical manipulation, mobilization, surgery, and other treatments is apparent and well known to the chiropractic orthopedic community. Despite rigorous anatomic training in chiropractic school, the branches of the vertebral artery that perfuse related structures as it ascends the cervical spine are often not clearly demonstrated in anatomy textbooks, and therefore, may not be appropriately emphasized in the curriculum.

Each vertebral artery is divided into four segments with segment V3 traversing the suboccipital triangle. Any muscular branch that emanates from this segment to supply the suboccipital muscles is called the suboccipital artery of Salmon (named after the French anatomist and angiologist Michel Salmon) (George & Laurian, 1987). Previous authors have reported a low frequency of the suboccipital artery of Salmon (Tubbs, Shah, Sullivan, Marchase, & Cohen-Gadol, 2009). In our cadaveric study, we found the suboccipital artery of Salmon in ten out of fifteen (67%) embalmed adult cadavers. Two of the ten cadavers (20%) demonstrated bilateral and symmetrical suboccipital arteries of Salmon (one artery on each side). Four of the ten cadavers (40%) had an arrangement of two parallel suboccipital arteries of Salmon on one side, and one on the contralateral side. Three of the ten cadavers (30%) displayed an asymmetrical

unilateral arrangement (only one artery). One of the ten cadavers (10%) displayed the unique arrangement of three arteries of Salmon on one side and one artery on the contralateral side. Thus, our data suggest this artery is found in much higher frequency than previously thought and future studies could verify these findings.

Nonetheless, our findings are very interesting in relation to clinical observations and radiologic findings of suboccipital muscular atrophy (Hallgren, Greenman, & Rechtien, 1994). Magnetic-resonance imaging of these muscles has revealed atrophy and, at least in one case, authors reported denervation as the cause of the atrophy (Andary, Hallgren, Greenman, & Rechtien, 1998). Another etiologic hypothesis could be reduced blood flow to these muscles due to atherosclerosis or even trauma of the suboccipital artery of Salmon or its related anastomotic network. Again, future studies could be designed to investigate this hypothesis.

There have been reports of decreased blood flow in the vertebral arteries causing dizziness (Foye, et al., 2002) and cervical radiculopathy (Stitik, Nadler, & Foye, 1999) in subjects placed in prolonged cervical extension at beauty salons (called Beauty Parlor Stroke Syndrome and Salon Sink Radiculopathy, respectively). Based on the location of the suboccipital artery of Salmon, it would be interesting to measure its blood flow in prolonged cervical extension and investigate any relationship between flow changes and suboccipital muscular atrophy.

Currently when formulating a differential diagnosis for headache, dizziness, and/or neck pain, chiropractic orthopedists should consider the vasculature of the suboccipital region—and in particular the possible presence of the suboccipital artery of Salmon—in relation to common cardiovascular comorbidities (hypertension and hyperlipidemia) that a patient may have that could decrease perfusion to the suboccipital muscles and related structures.

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Further Reading

In addition to our current paper (D'Antoni, et al.), for a detailed review of the V2 and V3 branches, see the paper by Tubbs, Shah, Sullivan, Marchase, & Cohen-Gadol (2009).

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Announcements

American College of Chiropractic Orthopedists Annual Convention to be held in Las Vegas – April 28-30, 2011

Mark your calendars for the 2011 ACCO convention that will be held April 27th-30th, 2011. We will be meeting at the new Tropicana in Las Vegas. The College has lowered the convention price. We have some great speakers scheduled. Please note there will be a class on Thursday night and no class on Sunday.

The room rate is $125.00 on Friday and Saturday and $95.00 on Sunday through Thursday. There are no resort parking fees. The hotel is close to the airport. There are no charges for children under 18 staying in rooms with parents.

Please plan on joining us in Las Vegas in 2011. More information is forthcoming from the ACCO. Contact the ACCO for information and to register.

Congress of Diplomates Meeting – April 30, 2011

The Congress of Diplomates will meet April 30, 2011 at the American College of Chiropractic Orthopedists (ACCO) symposium in Las Vegas, NV.

The Academy would like to offer the specialty an opportunity to present interesting cases or discuss research projects with other Diplomates. Diplomates are invited by this notice to present papers to the conference attendees. These are 10-15 minutes presentations of cases or research work.

Contact Dr. Jerry Wildenauer at (aco@dcorthoacademy.com) to reserve your spot. This has always been well received by the conference attendees. Don't wait, contact the Academy.

Editorial Review Board Annual Meeting

The Journal of the Academy of Chiropractic Orthopedists will convene an ERB meeting during the American College of Chiropractic Orthopedists Annual Convention on April 28, 2011. All ERB members are cordially invited to this meeting. More information is forthcoming from the Academy.

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The Academy is working in a proactive manner as an advocate of chiropractic patients, chiropractic orthopedists and the chiropractic profession. Many advances and services are being offered by the Academy including:

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