The New Era Press

Burcon Chiropractic Research Institute

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Burcon Chiropractic
Research Institute

Rejuvenate your mind, body and spirit with Cervical Specific Chiropractic, Medical Massage and CranioSacral Therapy

Grand Rapids ~ Overlooking Lake Eastbrook

616.575.9990

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MenieresResearch.com

Monday…	9:30 am – 5:30 pm
Tuesday…	12:00 pm – 2:00 pm
Wednesday…	9:30 am – 5:30 pm
Thursday…	12:00 pm – 2:00 pm
Friday…	9:30 am – 2:00 pm
Some Saturdays…	10:00 am – 2:00 pm

New Patients

Examination (1 hour)…	300.
Short Exam…	160.
Long Exam…	500.
Neck X-rays…	200.
Back X-rays…	160.

Practice Members

Regular Office Visit (includes traction or re-check)	70.
Long Visit…	90.
Short Visit…	50.
Children…	40.
Individual X-Ray…	40.

Resting (must choose one)

Massage :	15 minutes…	25.
	30 minutes…	35.
	60 minutes…	60.
	90 minutes…	90.
Traction therapy…		25.
CranioSacral therapy by doctor 15 min…		60.
Burcon Cervical Protocol re-check…		25.

Meniere's 12 Visit Intensive Care

Over one month for local patients, one week for out of town patients,…	3,000.
Doctor's Training Program…	3,000.
House calls…	3,000.

Policies

You must rest for 15 minutes after your Atlas adjustment before you can get re-checked. If your insurance does not pay, you have to.

Annual X-rays needed for adjustment.

Office visits by appointment only.

Missed visit, returned check, late payment… 40.

The Chiropractic Choice April 2017
International Chiropractic Association

By Julie Mayer Hunt, D.C., D.I.C.C.P., F.C.C.J.P., President for the Society of Orthospinology and founding member and secretary for the ICA Council on Upper Cervical Care. Jane and Dr. Mike Burcon visited Rose Radiology in St. Petersburg and Mayer Chiropractic in Clearwater, FL in May 2017. Dr. Mike wanted to learn more about CCJ research to better help his 738 Meniere's patients.

The Craniocervical Junction (CCJ) is the most complex joint region in the body. The CCJ is a collective term that refers to the occiput (posterior skull base), Atlas, Axis and supporting ligaments. It is a transitional zone between a mobile cranium and a relatively rigid spinal column. It encloses the soft tissue of the brainstem at the cervicomedullary junction (medulla, brainstem and spinal cord). It is critical to fully understand the neurology, biomechanics, soft tissue integrity including ligaments [7], blood flow, and cerebral spinal fluid flow at the junction between the brain and the body.[3]Magnetic Resonance Imaging (MRI) of the CCJ provides additional insights to be considered when evaluating care or treatment for this region. Performing imaging in an upright posture compared to recumbent can reveal significantly different parameters. The purpose of this paper is to illustrate observations on CCJ imaging utilizing upright MRI.

Introduction

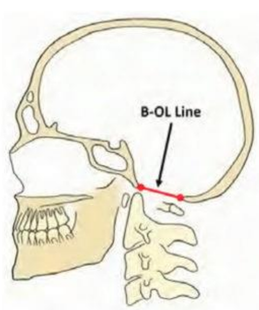

Figure 1. Basion-Opisthion (B-OL) Line

Chiropractors have always looked to perform upright X-ray imaging to be able to observe functional spinal relationships because gravity affects posture. Weight bearing is essential in understanding spinal functional dynamics. The same applies to Magnetic Resonance Imaging (MRI). Looking at spinal dynamics with respect to disc involvement, when the spine is supine, the disc will be under less gravitational load when compared to standing or seated.[4] Just as you would check the air pressure in car tires while on the ground as compared to on a lift, you want to see weight bearing effects on spinal dynamics functionality. The base of the brain has cerebellar tonsils, which in large part are responsible for our balance and coordination. The brain and spinal cord are one unit, think of the spinal cord as a long braided ponytail, it is an extension of the brain. When the base of the skull and the Atlas/Axis become misaligned, the dentate ligaments supporting and protecting the brainstem can potentially produce caudal tension at the skull base creating a downward tug at the brain base. The CCJ is the main circuit breaker neurologically as well as being the "mouth" to the brain for fluid exchange – including both CSF and blood. The CCJ is best imaged upright to observe true functional positioning of key components such as the cerebellar tonsils. When MRI imaging is done in a supine fashion the back of the head can act like something of a "bowl" and the brain tissue tends to slide into the bottom of the bowl. When viewed upright, the brain tissue may occupy a different position. Also spinal misalignments can be observed and pictures are difficult to argue with.

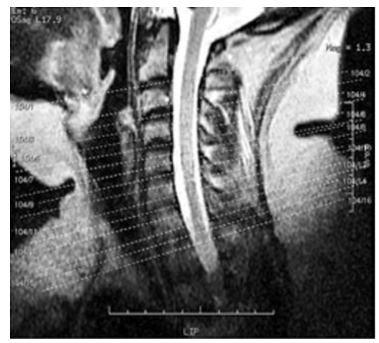

Figure 2. Typical Cervical Spine Axial MRI Slices

Chiari Malformation is a serious neurological disorder where the bottom part of the brain (cerebellar tonsils) descends into the foramen magnum crowding the brainstem/spinal cord altering CSF flow dynamics producing many disabling symptoms. Symptoms can vary greatly from one person to another, and some patients may be asymptomatic until a trauma occurs.[2] The most common symptoms include neck pain, headaches, visual abnormalities, poor coordination, difficulty swallowing, nausea, dizziness, cognitive issues, anxiety and depression. Cerebellar tonsil position is commonly measured using the Basion-Opisthion Line (B-OL), also known as the McRae Line), shown in Figure 1. When the cerebellar tonsils descend five (5) mm or less below the Basion-Opisthion line (skull base) and into the spinal canal, this is referred to as Cerebellar Tonsillar Ectopia (CTE), and may be listed as Chiari 0 or borderline Chiari 1 depending on the exact measurement. A Chiari 1 is measured as more than five (5) mm descent of the tonsils into the spinal canal. With respect to the Craniocervical Junction (CCJ), most standard MRI imaging does not observe this region sufficiently. Axial brain MRI imaging usually will terminate a slice or two under the skull base.(5) Axial imaging of the cervical spine usually begins at the C2 disc and proceeds caudally to the C7 region as depicted in Figure 2. Sagittal cervical MRI imaging are usually four (4) to five (5) millimeter slices which can miss detailed structures of the CCJ like cerebellar tonsils, which are small peg like structures at the base of the brain, and CCJ ligaments which average two (2) mm in diameter. Therefore the CCJ soft tissue has been routinely overlooked. Most CCJ imaging in the past has utilized Computerized Tomography (CT) to rule out fracture.[6]

Methods

For CCJ MRI imaging, the patients are sitting or standing and images were obtained on the coronal, sagittal and axial planes (depicted in Figure 3) using sequences as shown in Figure 4. In these sequences:

- The slice thickness in these cases is 2.8 mm.
- The axial slices were obtained in proton density (PD) which is best to see ligaments.
- The sagittal slices were obtained in T1 (longitudinal relaxation time) and T2 (transverse relaxation time).
- Coronal images were obtained in T1.

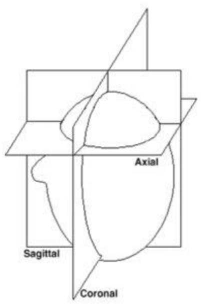

Figure 3. MRI Imaging Planes

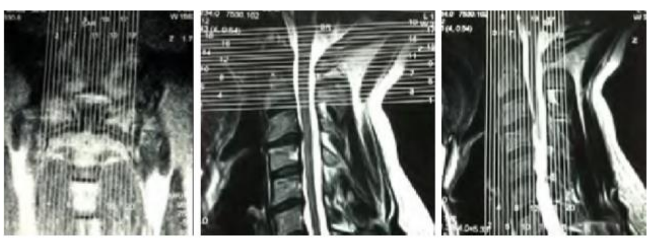

Figure 4. CCJ MRI Sequences in the Sagittal (left), Axial (middle) and Coronal (right) Planes

Observations

Patient presented with neck pain, headaches, brain fog, and occasional dizziness. The previously ordered recumbent brain MRI (Figure 5) was unremarkable and included a statement of "no observations of a Chari malformation." An upright cervical spine MRI was ordered including the CCJ (Figure 6) and this study finds a Chari 1 malformation in conjunction with other findings.[2]The comparative upright imaging shows increased involvement at the CCJ with respect to cerebellar tonsils, and the patient's headaches are better lying down and increase in the upright position correlating with tonsillar position. Most patients with headaches report that lying down is better than upright when they are known to have Chiari malformations.

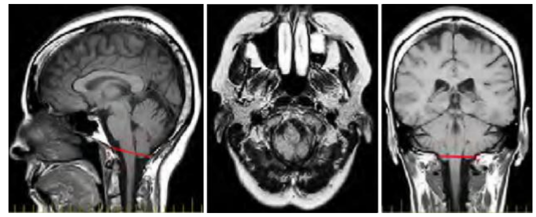

Figure 5. Recumbent MRI Brain Imaging

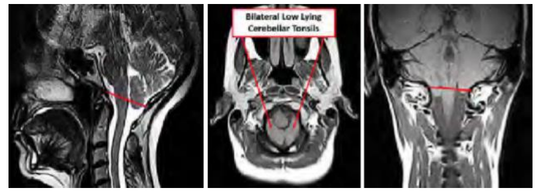

Figure 6. Upright Cervical Spine MRI Imaging

Atlas Rotation Observations: When Atlas rotates, it is plausible anatomically that the transverse process can abut the internal jugular vein. Figure 7 depicts two examples of Atlas rotation misalignment. The red line highlights the rotation. The yellow arrow points to an internal jugular, which appears to have been compressed by the misaligned Atlas. This compression can potentially affect venous outflow from the brain, causing backup of venous metabolic waste blood in the brain which is suggested in neurodegenerative brain diseases. Also note the oblong shape of the spinal canal which plausibly can suggest dentate ligament attachment tension at the brainstem.[8,9]

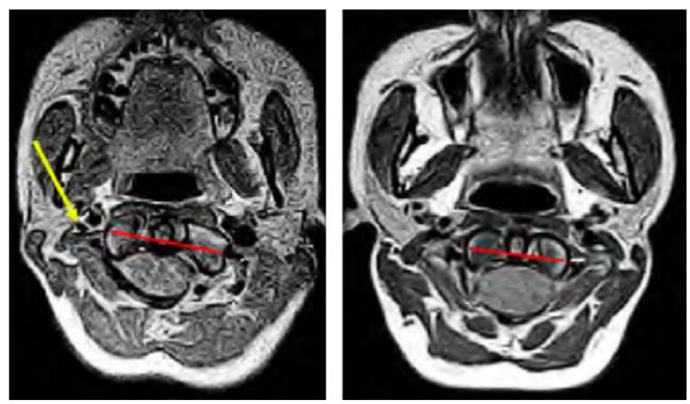

Figure 7. Atlas Rotation Misalignment

C2 (Axis) rotation can be observed on CCJ MRI. Figure 8 provides several examples of Axial Rotational misalignment. The standard cervical spine MRI misses this segment because the slices start at the C2/C3 disc. When one considers the vertebral artery pathway, illustrated in Figure 9, the axial misalignment can plausibly correlate with vertebral artery insufficiency and also the misalignments can affect dentate ligament tension of the spinal cord.[8,9]

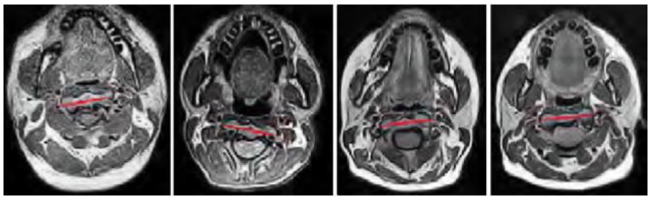

Figure 8. Axis Rotational Misalignment

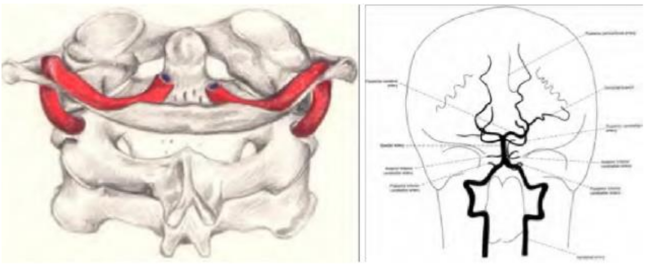

Figure 9. Vertebral Artery Pathways

C1 misalignment can be observed in the sagittal view with respect to the occipital condyles and the Atlas lateral mass position. Figure 10 (A) suggest anterior misalignment of the Atlas lateral mass with respect to the occipital condyle. Figure 10 (B) depicts a normal positioning of the C0/C1 articulation.[1]

Figure 10. Sagittal Atlas Misalignment (A – left), Normal Alignment B – right)

Discussion

Observations that can be made through upright MRI have the potential to clearly objectify spinal misalignment (Subluxation) and clarify patient care needs. The CCJ is a vulnerable region and merits special consideration for care and treatment. There are many parameters for studying the CCJ through MRI which can range from CSF and blood flow impedance, ligamentous laxity and or insufficiency, and Cerebellar Tonsillar Ectopia as well as Chiari involvement.[1]In 2012, the Glymphatic system was postulated (10) with regards to lymphatic drainage and brain health. The Lymphatic system that was discovered in the brain is dependent on CSF flow. The CSF flow, when obstructed, appears to have negative plausible effects on brain health. Therefore having the CCJ aligned contributes to non-obstructed flow of CSF and should contribute to improved brain health.

Conclusion

Trauma continues to be a major player in the disruption of the CCJ integrity. Falls, motor vehicle crashes, sports injuries and other traumas affecting the head and neck relationship throughout our lives play into the ability of the CCJ to facilitate the brain/body connection. All patients deserve an appropriate evaluation of the CCJ for optimal brain health parameters and brain/body for our health. There is much more that needs to be studied and understood to optimize brain health. The upright MRI imaging is a platform that potentially could allow Neurology, Neuroradiology and other medical specialties to work together with board certified Chiropractic CCJ procedure specialists to benefit patients and families. Understanding the complexities of the CCJ should compel all health practitioners to study further and understand how to optimize the function of the most complex joint region of the body.

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