The Three Biggest Pitfalls

with MRI and Spinal Ligament Injury Diagnosis

BY JEFFREY A CRONK DC JD

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THE THREE BIGGEST PITFALLS WITH MRI AND SPINAL LIGAMENT INJURY DIAGNOSIS

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Author Note:

In this report I have taken precautions to try to define every common or technical word as it comes up. I do this to try to get you the information in a way that you can fully understand and use it. Not everyone is familiar with the *nomenclature* (technical terms of a specialty or subject). I have been teaching professionals, doctors, attorneys, insurance adjusters, etc., and I have found a vast degree of misunderstanding and confusion in the market today. I am in no way trying to contribute to this confusion. I would suggest that to get the most out of this report, please do not go past a word or term that you do not fully understand. Take a moment to look the word up with a simple Google search and then the whole thing should make more sense to you. What is in this report can seriously improve your understanding of the simplicity of spinal ligament injury diagnostics.

"Alignment Improves Function"

To begin with I want to just give you a short bio about me so that you can decide on my credibility. I have been a licensed doctor of Chiropractic since 1988. I was taught that the key to health was based on three simple words: "Alignment Improves Function". My education was on the ability to locate and remove what is called a spinal subluxation, which is a misalignment of the motion or position of a spinal vertebra(s) that then causes nerve interference, and inherent undesirable symptoms.

I came out of Palmer College of Chiropractic in Davenport Iowa, one of the best chiropractic programs in the country. Palmer College of Chiropractic was established by the founder of Chiropractic D.D. Palmer and then was dramatically expanded upon by his son, B. J. Palmer.

What I was not taught in my chiropractic program was that the spine cannot be misaligned (in motion or position) unless there has been some form of trauma to the spinal ligaments. I was not taught that this ligament injury would be the most significant cause of pain, suffering, impairment, disability, and costs in the healthcare system today. However what I was given in my chiropractic education was the foundation that would allow me to discover this clinical truth.

After my chiropractic education, I immediately went to work and did a short stint as a clinical associate, for a very good doctor of chiropractic Jeffrey Abrams, DC, in Seattle Washington. Within a year I had opened my own private practice. In came the patients with all kinds of conditions: neck pain, back pain, headaches, arm pain, leg pain, ear pain, facial pain, cognitive impairment, sciatica, tinnitus, vertigo, etc. Little did I know at the time that these were very common symptoms of a thing called a *spinal ligament injury,* and the inherent *spinal instability* that it could cause. At the time, I only knew that in general what I was looking for was misalignments of the spine that were causing these conditions.

Spinal Subluxation = Spinal Instability

Misalignments of the spine are very common, however when these misalignments cause interference with the nerve they become what the chiropractic profession has called a *Spinal Subluxation* and the what the medical profession calls a *Spinal Instability*. Both terms are communicating an identical clinical entity. However, it was not until years later that I would fully understand this: the ligament was the key piece of tissue that was involved with both terms.

In my private practice, I struggled with the idea of trying to realign the spine itself. Gross spinal misalignment patterns of the spine that have been identified as non-optimal to the health and the optimal function of a human body had been identified.

An example of one such misalignment pattern would be the loss of cervical curve, or worse yet the reversal of a normal cervical curve. Both the chiropractic profession and the medical profession knew that these misalignment patterns reduced optimal function in a human body. Rene Calliet, MD was one of the pioneering physicians who created the specialty of Physical Medicine and Rehabilitation.

Dr. Calliet educated other physicians that the loss of the normal cervical alignment patterns caused Forward Head Posture (FHP) and that this "can add up to 30 pounds of abnormal leverage on the cervical spine. This can pull the entire spine out of alignment. FHP results in the loss of vital capacity of the lungs by as much as 30 %. This shortness of breath can lead to heart and blood vascular disease. The entire gastrointestinal system is affected, particularly the large intestine. Loss of good bowel function and evacuation is lost in FHP. It causes an increase in discomfort and pain, because proprioceptive signals from the first four cervical vertebrae are a major source of the stimuli, which create the body's pain controlling chemicals (endorphins). With inadequate endorphin production, many otherwise non-painful sensations are experienced as pain. FHP dramatically reduces endorphin production." [1]

I spent the latter eight years of my clinical practice trying to fix or realign that patterns that Dr. Calliet spoke of above. Two additional experts in spinal injury made big contributions to my understanding this field: Drs. Pettibon and McCoy. Burl Pettibon, DC of the Pettibon Institute teaches that all spinal misalignment patterns are caused by spinal ligament damage, and he advocates plenty of ways to correct this. It was with Dr. Pettibon that I these misalignment patterns can be corrected.

Harold McCoy, DC was one of the first Doctors of Chiropractic to be accepted a Doctor for the US Olympic Team and was assigned to help athletes such as Evander Holyfield of the US Boxing team. Dr. McCoy taught that these ligament injuries could be identified with stress x-rays by the accurate measurement of the intersegmental motion patterns on them.

Spinal Ligament Injury Testing

In 2005 I started National Injury Diagnostics to measure the intersegmental motion patterns seen in stress radiographs. In 2010 I closed this company and became a part of a medical company called Spinal Kinetics, LLC. Spinal Kinetics today is the largest most well-known spinal ligament injury testing company in the country. Our board certified medical radiologists use a proprietary system that we built to accurately measure for abnormal motion patterns in the spine that are associated with spinal ligament injuries. We know that this problem (Spinal Instability) is the number one cause of pain, impairment, disability, and cost to society today. Our mission it to reduce this catastrophic problem by providing the means for all doctors to diagnose this condition accurately, as soon as the patient receives it. Early detection of course will lead to better corrections, and significantly better results. (www.thespinalkinetics.com).

As the Director of Education for Spinal Kinetics, LLC my task is to provide materials for doctors to better understand this condition. In 2010 I formed a company called American Spinal Injury & Impairment Consultants to do further consulting in the area of Spinal Ligament Injuries. In 2015 I developed the first online training program for doctors that was dedicated to educating them how to better diagnose, manage and document this condition. This program can be found at www.smartinjuryeducation.com.

To date -good or bad- I do not think there is a doctor in the country that has more experience with the delivery of this type of testing. The testing I am talking about is Spinal Ligament Injury Testing, by accurately measuring for the excessive joint motion that these injuries leave behind.

The rest of this report will be geared toward giving you a little better understanding of how spinal ligament injuries are accurately diagnosed today in the clinical setting. This information will improve the understanding of the way spinal ligament injuries are evaluated and diagnosed, so that we as professionals can get much better results and less chronicity with this type of injury. With proper early, accurate diagnostics doctors can make better and smarter choices on treatment paths that can and will be highly effective for better patient recoveries.

For those of us who are spinal ligament injury experts, we know that MRI is NOT the best imaging choice for a spinal ligament injury, as it misses far too many severe ligament injuries. This is because MRI reads do not report on the most important *biomarker* (generally refers to a measurable indicator of some biological state or condition) of a spinal ligament injury: excessive motion. Now that statement may be confusing to many doctors or attorneys at first. Continue reading, and the truth of the statement will be self-evident. MRI is a fabulous test if you have a disc herniation (one of the ligaments found in the spine).

This report is not about minimizing MRI, but rather showing where it shines and where it does not, so that we can utilize it and other tests more effectively.

Chronic Pain

Patients that get spinal ligament injuries right now have an extremely high risk for being a chronic pain patient for the rest of their life! That is because spinal ligament injuries are often *painful, progressive, and permanent.*

Whiplash is a well-known slang term for a spinal ligament injury that occurs in an automobile accident. It is called "whiplash" because the neck is whipped violently back and forth and in the process the ligaments that hold the bones of the spine together are violently torn, stretched, and snapped.

Whiplash is highly studied as an injury because there is so much money involved in automobile injuries. In 2010 the cost to insurers was $242 billion and the societal costs were estimated at $836,000,000,000.00 - which is a lot of money. (2) Now the problem that this report is addressing is the fact that so many patients today end up in chronic pain after their doctors have treated them. This condition causes chronic pain on a very large scale. To see just how much chronic pain there is after a whiplash injury I created a video for the Spinal Kinetics YouTube Channel: Whiplash Statistics Don't Lie at: https://www.youtube.com/watch?v=st5bwC411VU

The statistics on just this one injury type are staggering. Here is an example:

> *"In the longest study ever performed on whiplash-injured patients (a study looking at the health status 17 years after injury),* ***55% of the patients still suffered from pain caused by the original trauma.*** *(Accident Analysis and Prevention, 2002)"* (3)

This means that 55% of the people this year that are treated for ligament instability are going be no better and have the same problems 17 years later. What does that say for our doctors in the system? To me it says that there is a lot more to know in this area, as these results are bad! If there are close to 4 million of these type injuries annually, it means that every year this one "mechanism" delivers 2 million new chronic pain patients into society every year, and this number builds. In a decade, this will deliver 20 million chronic pain patients into the market.

Patients that cannot get this injury properly addressed and rehabilitated so that they have no chronic pain, impairment, or disability can be in for some huge future expenses, which can be financially devastating.

Right now in America and in the world, spinal ligament injury is the number 1 cause of physical pain, discomfort and disability. It accounts for more costs than any other injury. The American pain Society says: "Medical treatment for chronic low back pain is estimated to cost $9,000 to $19,000 per patient annually..." (4)

> *"Health economists have reported the annual cost of chronic pain in the United States is as high as $635 billion a year, which is more than the yearly costs for cancer, heart disease and diabetes"* (5)

Chronic pain costs the patient a fortune in future medical expenses, so the real goal is to rehabilitate from the injuries properly from the start so that these future costs are reduced for the patient. The ability to properly treat comes from the ability to understand the severity and the location of the patient's injuries and *that* comes from proper diagnosis.

Diagnosing Ligament Injury

Diagnosis means to identify the nature of an illness or other problem by examination of the symptoms. Nature in this sense means a phenomenon found in the physical world, or in this case a physical cause in the body. In the case of an injury, we are looking for a physical derangement that is causing the symptom.

We only need to know two things:

What are the symptoms associated with this injury?

What does the injury physically look like?

Here is a partial list of the most common symptoms of a spinal ligament injury, derived from respected medical sources:

- *neck pain*
- *lower back pain*
- *midback pain*
- *shoulder pain*
- *scapular pain*
- *pain radiating down the arms*
- *pain radiating down the legs*
- *disturbances in concentration*
- *disturbances in memory*
- *concussion syndrome*
- *numbness*
- *tingling or a sense of weakness or heaviness in the legs*
- *numbness*
- *tingling or a sense of weakness or heaviness in the arms*
- *visual disturbances*
- *ringing in the ears*
- *difficulty swallowing*
- *difficulty breathing*
- *bladder or bowel dysfunction*
- *headaches, migraine headaches*
- *sexual dysfunction*
- *severe fatigue, chronic fatigue syndrome*
- *myofascial pain syndrome*
- *facial pain*
- *ear pain*
- *hoarseness or loss of voice*
- *sinus congestion etc.*

Catastrophic ligament injuries can cause the patient to become quadriplegic, but we are not talking about the catastrophic ligament injury in this report. We are focusing on the common spinal ligament injury that does not contribute to catastrophic cord damage.

Auto accident is only one of the mechanisms that can deliver this type of injury to the spine. There are many more such as: work related injuries, sports related spine injuries, slip and falls, lifting injuries, diving accidents, horse falls, war related, domestic violence etc.

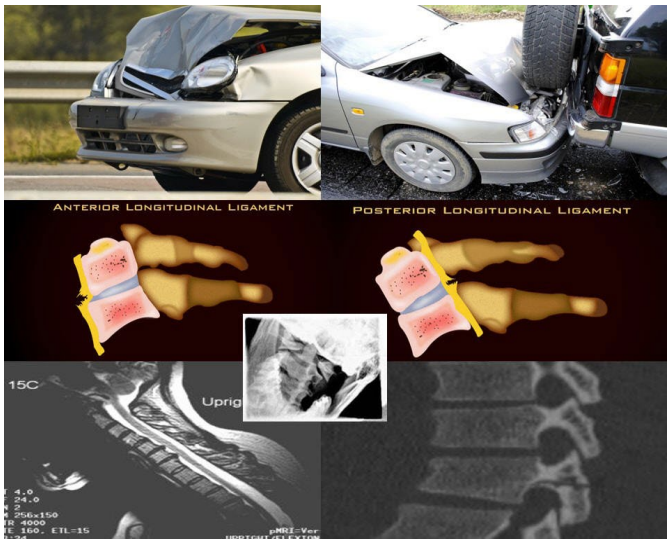
Upon appreciation of the wide scope of the symptoms, it is necessary to learn what the spinal ligament injury looks like.

All injuries physically derange the tissue and leave behind signs, collectively called a *physical lesion*, which is actually just a derangement pattern.

This is a burn, and the mechanism that caused it was probably hot grease or oil. The burn is an example of a lesion or a derangement pattern (injury pattern) left behind by the hot grease.

This is a dog bite. The tissue derangement pattern of injury is called a *lesion*. When a body part is injured the tissue deranges, or is disturbed in a logical fashion. Imagine going to a doctor that did not understand what a dog-bite or a burn physically looks like, yet they were going to treat them. This would be a real mess, yet that is exactly what is happening in with spinal ligament injuries today. Too many doctors do not know what they look like, and this is apparent by how they work their patients up (history, exam, imaging).

If the car occupant's spine suffered the force created by a collision, what would the spinal injury look like? The key to diagnosing the severity and location of this injury is knowing what it looks like. How could you determine the severity of a burn or a dog bite if you did not know what it looks like? You could not, and if you are not sure what the spinal ligament injury looks like then you have probably been missing them routinely on your patients.



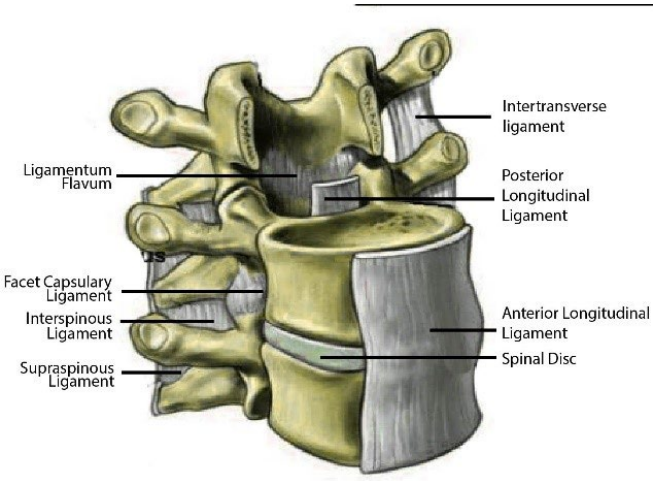
This shows the main injuries (derangement patterns-lesions) to the spine anytime it undergoes an injury from a mechanism that can deliver compressive or shear forces. The majority of these injuries are shown with simple x-rays, while only the disc herniation (addressing 10% of the spine ligaments) is reported on a typical MRI.

Limits of the MRI

The 3 biggest pitfalls with using MRI for spinal ligament injury diagnosis are the following:

1. MRI usually leaves 90% of the possible ligament damage to a spine undiagnosed.
2. MRI does not image the most important derangement pattern found in a spinal ligament injury.
3. MRI does not routinely diagnose the severe upper cervical ligament injury.

Pitfall #1: MRI usually leaves 90% of the possible ligament damage to a spine undiagnosed. To fully understand this first pitfall, look at the anatomy of spinal ligaments and compare to a typical MRI report.



Two vertebra = a human Spinal Motion Unit.

There are 10 ligaments that hold each Spinal Motion Unit together. (There are only 8 ligaments named in the illustration because the capsular ligaments and the transverse ligaments come in pairs, with one on each side.) One of these ligaments is the intervertebral disc, which means the disc is 1/10 or 10% of a Spinal Motion Unit's ligaments.

No one is ever going to say that the disc is not important, however what about the other 9 ligaments?

To illustrate this, look at a typical MRI report:

MRI OF THE CERVICAL SPINE

HISTORY: Motor vehicle accident. Neck pain.

TECHNIQUE: With the patient in the neutral weightbearing sitting position, sagittal T1-weighted image TR366, TE17, sagittal T2-weighted image TR1494, TE 120, gradient-echo axial images TR452, TE22, flipped angle 40 degrees.

MRI REPORT: Foramen magnum appeared normal. No evidence of tonsillar ectopia noted. Brainstem and cervical cord junction appear intact. Spinal appears intact. Vertebral bodies appear of normal height with normal marrow signal. There is straightening of normal cervical curve which may be due to muscular spasm and/or soft tissue injury. Clinical correlation is suggested in this regard.

At the C2-C3 level, no diffuse bulge or focal disc herniation noted. No evidence of central, lateral, or foraminal narrowing.

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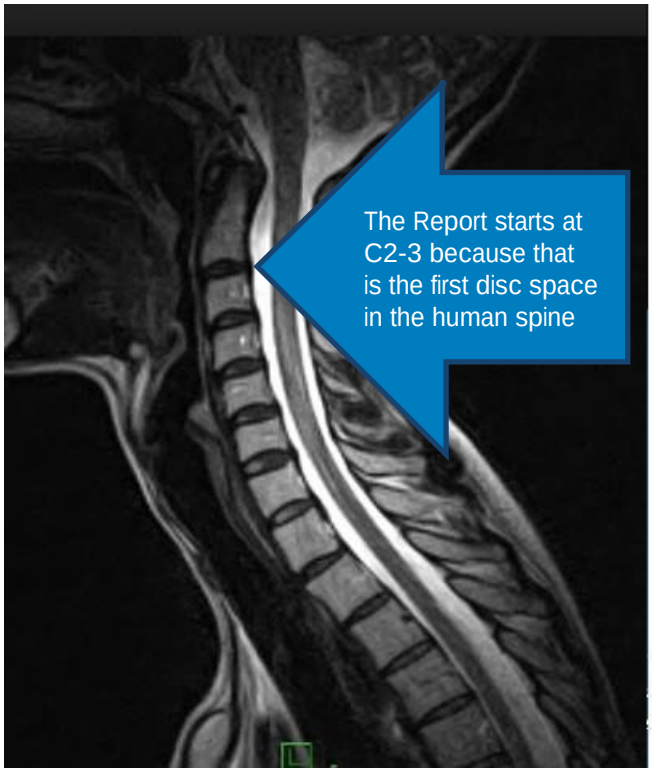

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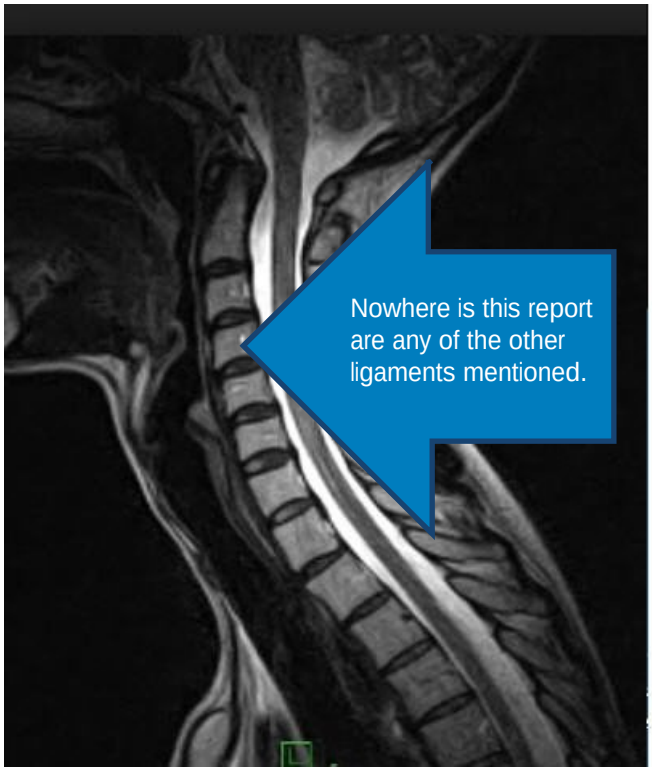

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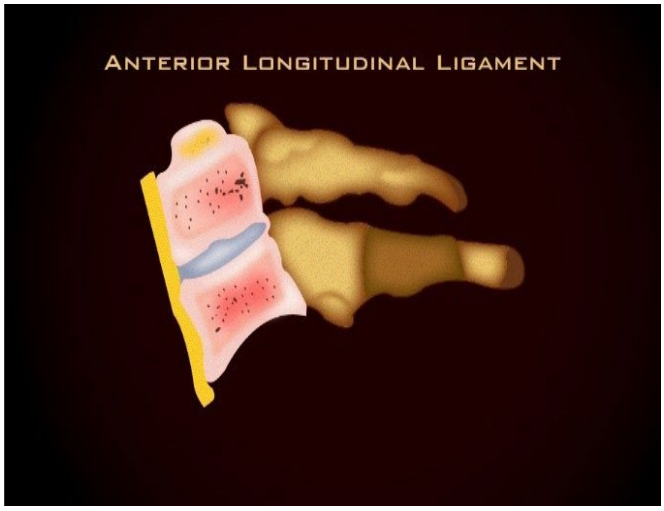
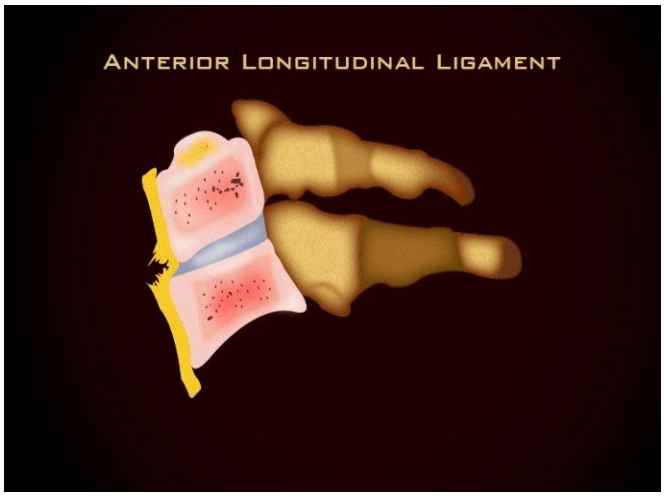
MRI has the possibility of being so much more. The machine produces fabulous images but the MRI report content is greatly minimized down to merely a “disc study”. The reports do not address the other 90% of spinal ligament injuries that can exist.

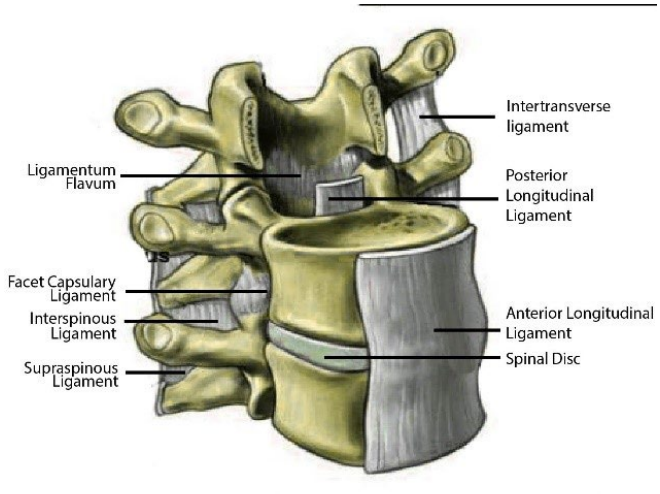
Pitfall #2: MRI does not image the most important derangement pattern with a spinal ligament injury: *Excessive Spinal Motion.*



Normal Alignment: when forces that are tolerable act upon spinal ligaments, they remain undamaged; the spine stays in a normal alignment pattern and there is not excessive motion detected. The yellow line on the image is the anterior longitudinal ligament, just 1 of the 10 ligaments that holds a normal Spinal Motion Unit in alignment.



Spinal ligament injury = Misalignment: When spinal ligaments are overcome and damaged by the forces they hyper-stretch, tear or snap in two *(avulse)* and this always results in excessive motion and instability in the affected joint(s). If the unstable joint is impinging on the spinal cord it causes *myelopathy.* Impingement of an unstable joint on the spinal nerve causes *neuropathy*, or it simply causes pain. These are all clinical manifestations of spinal instability. This is excessive spinal motion causing a neurological problem.



Ligaments are tough, flexible tissue that holds bones together to form a joint. It is the job of ligaments to keep all bones in proper position and to allow normal motion in the joints themselves, resulting in proper alignment and proper motion of the joint. When the ligaments are damaged, the bones would start to have excessive joint play or laxity in their movement patterns. This is very easily measured and quantified with special x-rays and an accurate measuring system.

It is not the purpose of an MRI to detect or report on excessive motion in the joints. That is the job of the most inexpensive and accessible imaging that there is which is x-ray, and more importantly stress x-rays.

Pitfall #3: MRI does not routinely diagnose the severe upper cervical ligament injury

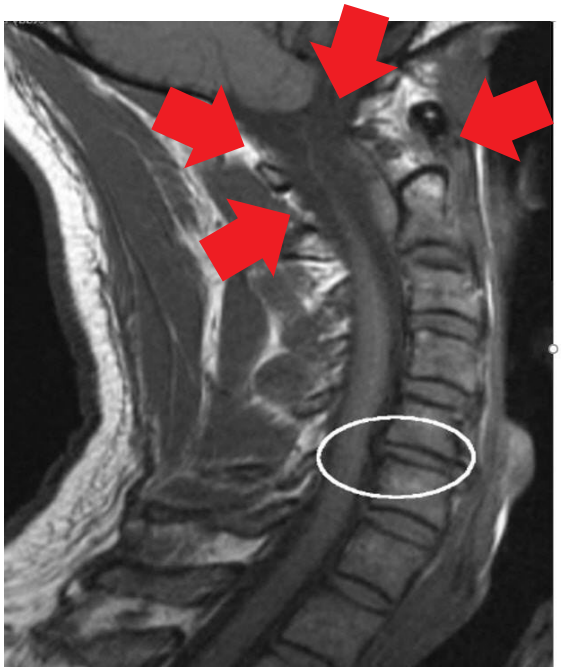
Diagnosis means to identify the nature of an illness or injury by assessment of the symptoms (*subjective* – what the patient complaining of) in conjunction with examination of observable signs (*objective* – what can be measured, seen, etc.). Nothing may be more productive of symptoms than those associated with damage to what is called the *craniocervical junction.* The most common symptoms are neck pain, headaches, migraine headaches, cognitive impairment, and visual disturbances.

The craniocervical junction comprises base of the skull (cranium-head), plus cervical 1 (atlas) plus cervical 2 (axis).

The skull is attached to the body by ligaments. The specialized ligaments of the craniocervical junction must allow for stability, yet allow functional movement of the head upon the body. What makes this area so important is that it is traversed by major blood vessels, lymphatic channels, and a great deal of nervous system tissue (spinal nerves, cranial nerves, and the spinal cord). The spacing is tight. Everything is held in alignment (proper spacing) because of these ligaments.

There are two major joints systems in this junction: the *atlantooccipital* (head to C1atlas) and the *atlantoaxial* (C1 atlas to C2 axis) joints. These joint systems are extremely different. The atlantoaxial joints allow for about half of the necks range of motion in flexion and extension, but almost no rotational movement. The atlantoaxial joint allows for little flexion and extension movement, but accounts for 25-50% of right and left rotation.

This area is being intensively researched at this time because there is so much neurology, blood flow, lymphatic flow, and cerebral spinal fluid flow associated with this small piece of bodily real estate. Everything that is important for the communication of the head to the body goes through this small area. It is all kept attached, separated, and in alignment by a series of small tough ligaments, called the ligaments of the craniocervical junction. The ligaments we are talking about are everything that is above the C2-3 disc space. Since there is no disc found in this area it is almost never mentioned in a standard cervical MRI report.



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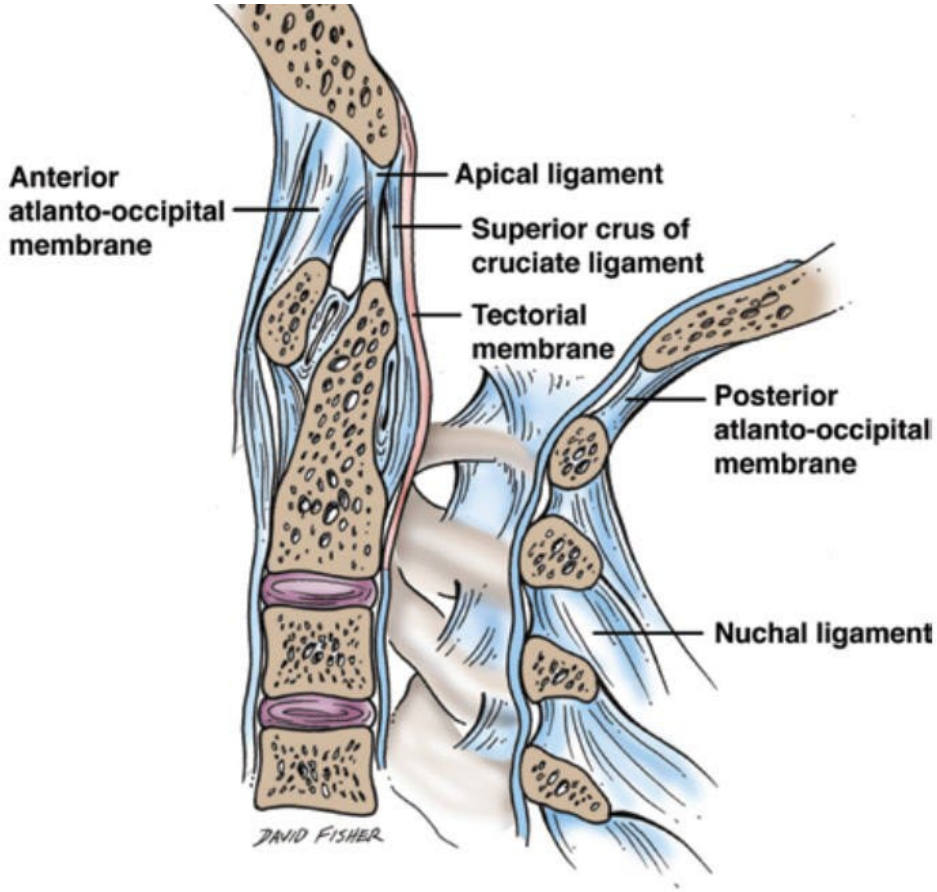


FIG. 9. Sagittal drawing of the neck and cranial base depicting the various specialized ligaments of the CCJ region.

When we look at this structure from the back to the front we can see even more ligaments that hold this whole are together.

Craniocervical junction ligaments

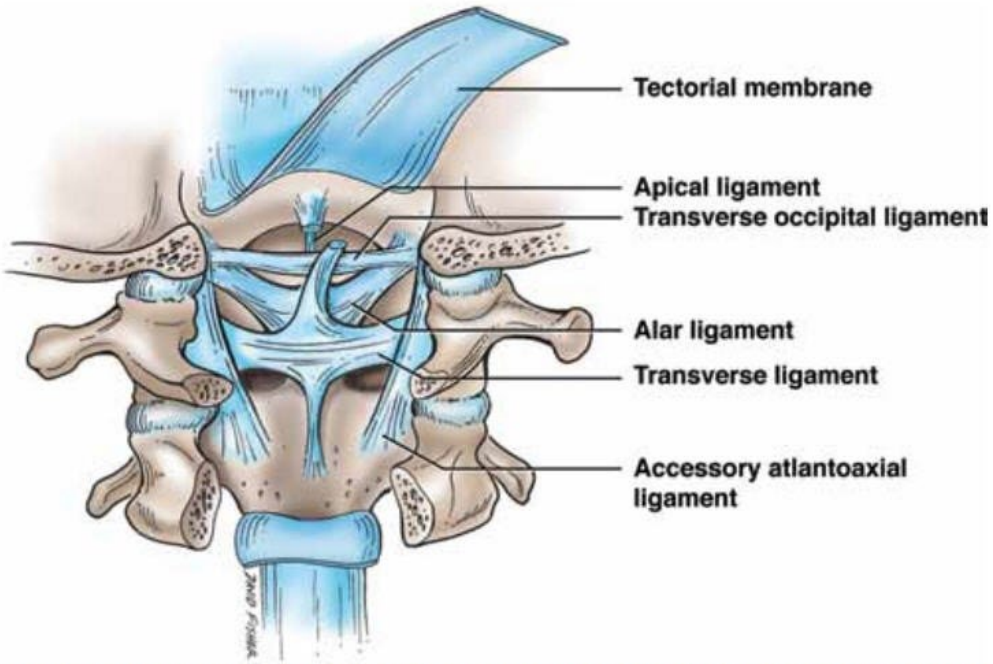


FIG. 1. Artist's drawing of the posterior CCJ illustrating its numerous specialized ligamentous structures. The tectorial membrane is reflected up and down in this drawing.

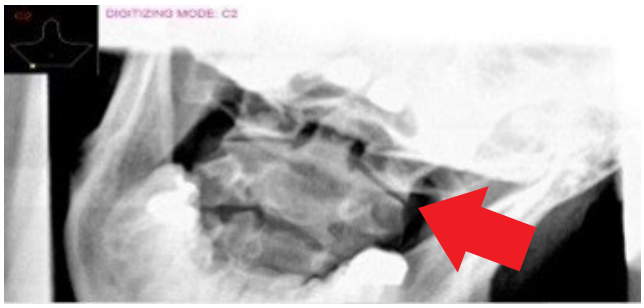
Common symptoms associated with ligament damage at the Craniocervical Junction (CCJ):

These are some of the most common and problematic conditions that any patient can have, yet this ligament damage is not routinely reported on a standard cervical spine MRI.

Imaging for detection of spinal ligament injuries

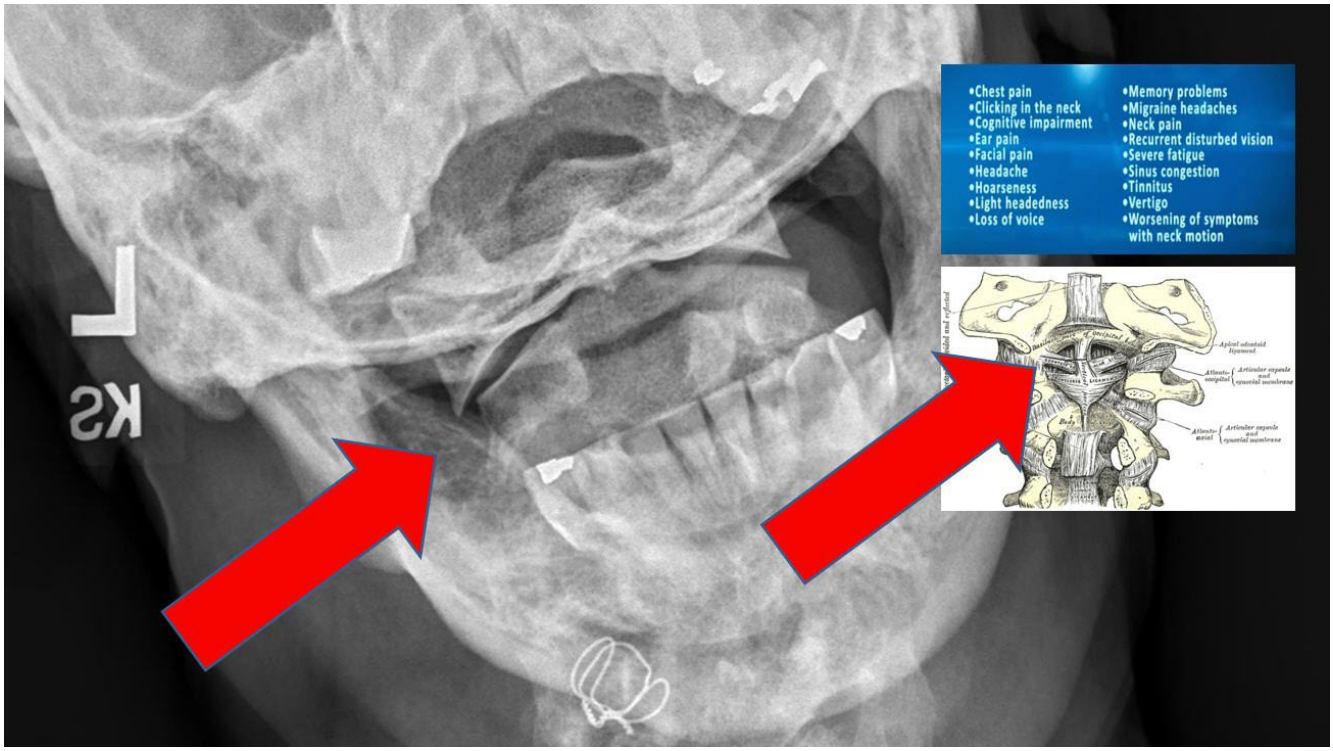
If these important ligament injuries are not reported on standard MRI, how is damage to these ligaments detected? First, we must get good clean stress imaging performed of the areas of the spine that are suspected of ligament damage.

The craniocervical junction is very easy to see it on a standard x-ray called and APOM (Anterior-Posterior Open Mouth) Right and Left Lateral Bend. The patient is put in the position to stress the area to see if it stays aligned. The only problem is that so many doctors who are treating neck injury patients do not order these views.



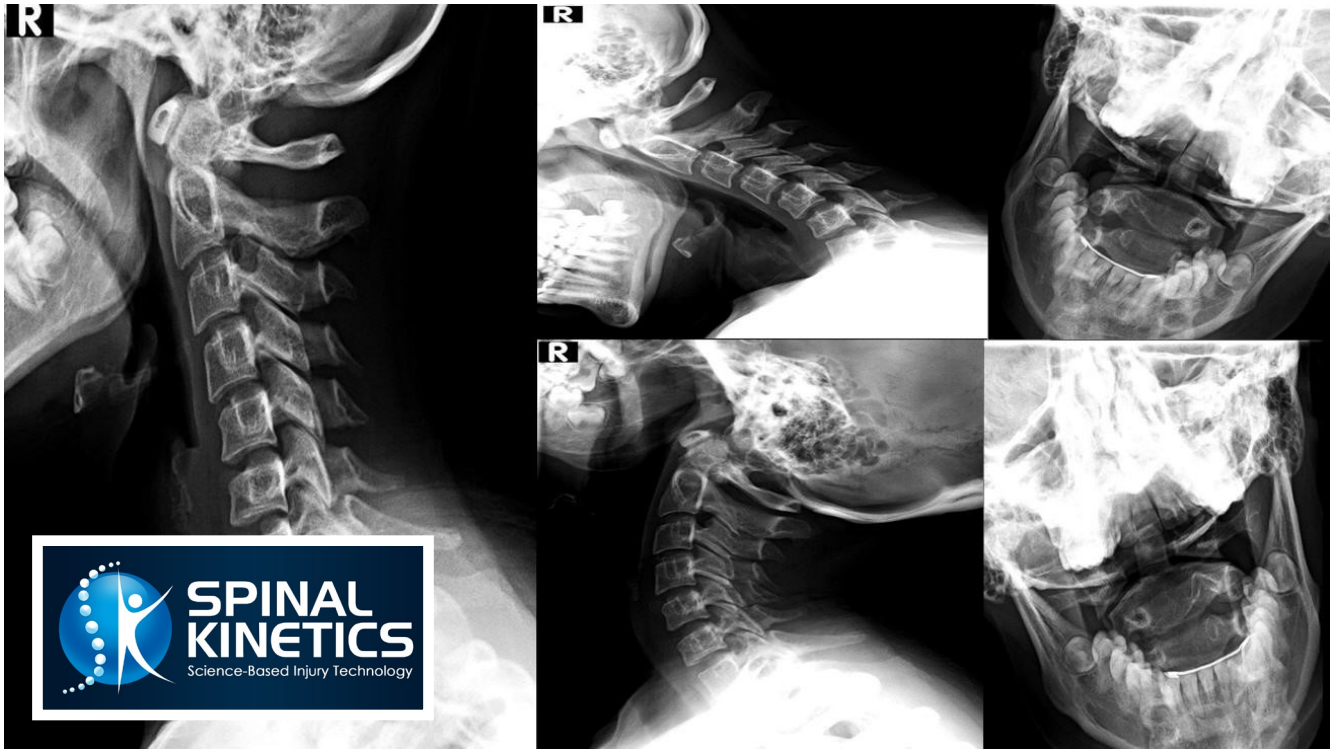
In this image the arrow is pointing to the fact that the C1 (atlas) is aligned with C2 (axis) perfectly. This view shows no damage to the area of the spine. This area can easily be damaged in trauma and should be taken and reviewed any time upper cervical ligament injury is suspected.

The image below shows severe damage to the ligaments, which is identified by the overhang of C1 (atlas) – C2 (axis). This is really easy to see.



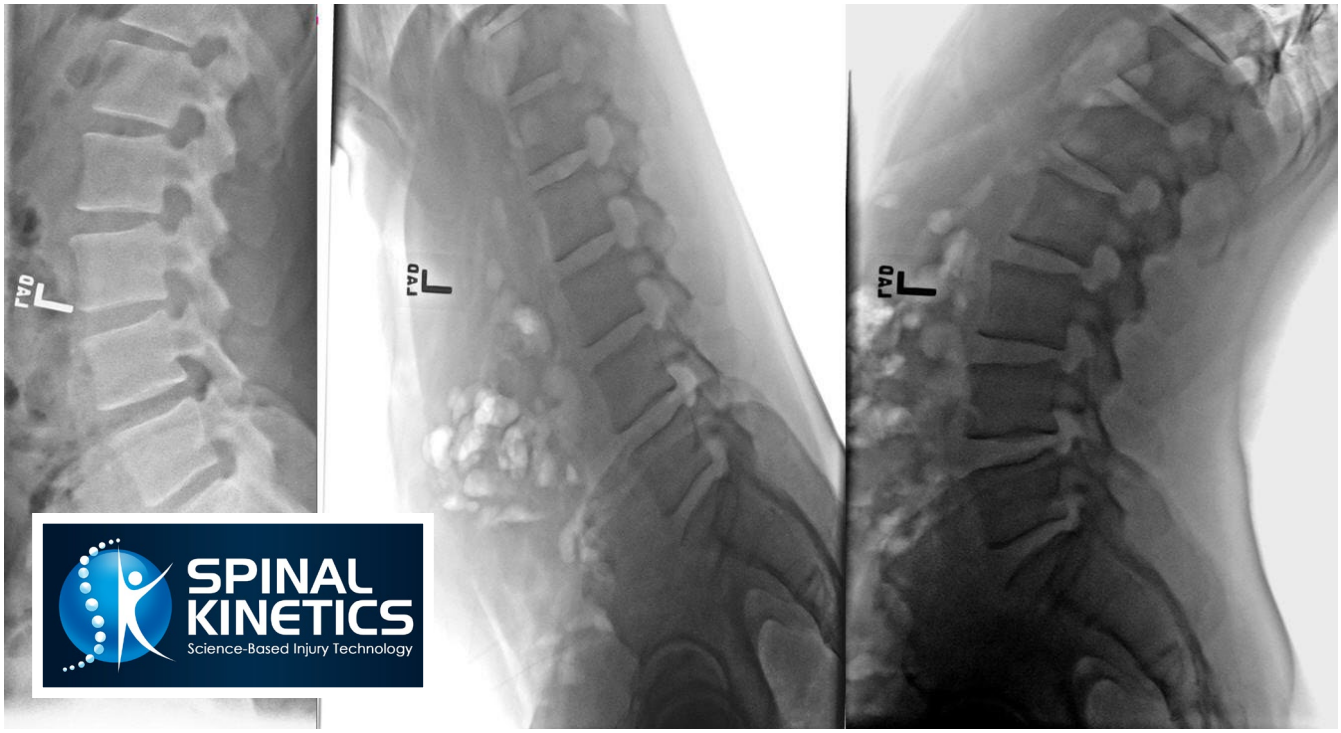
In the image above we also have some of the most common and accepted symptoms that are associated with this ligament injury.

These x-ray views are needed to fully assess cervical spinal ligaments:



Notice these cervical x-rays have a neutral, flexion, extension and include a APOM (A-P Open Mouth) lateral bend right and left. The APOM view has been most widely used in the chiropractic profession to determine the stability of the C1 (atlas)-C2 (axis) joint. It provides very important information for those that perform manual adjusting procedures with the acutely injured. Since this is not a standard view ordered by allopathic medical practitioners, many doctors have never seen it and are unaware of doing this procedure or ordering the correct views.

For the lumbar spine, the following images are needed:



Computerized Radiographic Mensuration Analysis (CRMA™)

The images must go through a procedure to accurately measure them, so that we can quantify the excessive motion.

The procedure of measuring things in x-rays is very old, probably as old as x-rays themselves. Today measuring excessive joint motion on x-rays of the spine is perhaps one of the most important procedures that can be done. Yet there are very few radiologists that perform this, for one very important reason: they do not have a computer program that allows them to do it accurately.

Spinal Kinetics, LLC that has developed its own technology for doing just that. The process of accurately measuring spinal motion, is called Computerized Radiographic Mensuration Analysis or CRMA™ for short. This is quite a simple process in a very complicated field of imaging. Images today come in different formats (arrangement of form), at different outputs and are shot at different distances. These factors and many more are important for capturing good quality films, and can affect the ability to get an accurate read. Therefore, Spinal Kinetics developed their own system for their Board-Certified medical radiologists to use the CRMA™ program on any set of spinal x-rays taken in any state in the United States of America.

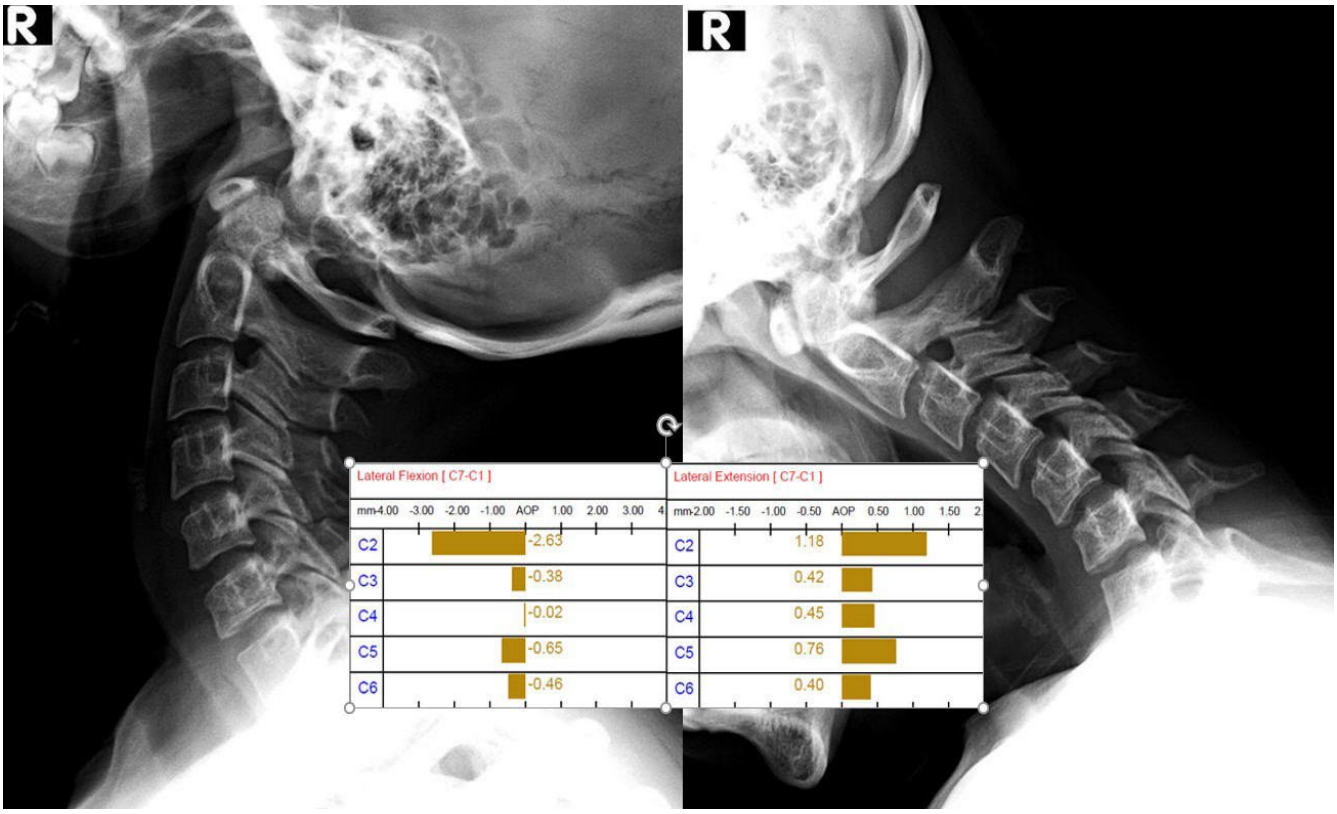
Spinal Kinetics, LLC For More Information call:

1-877-508-9729 or visit their website at:

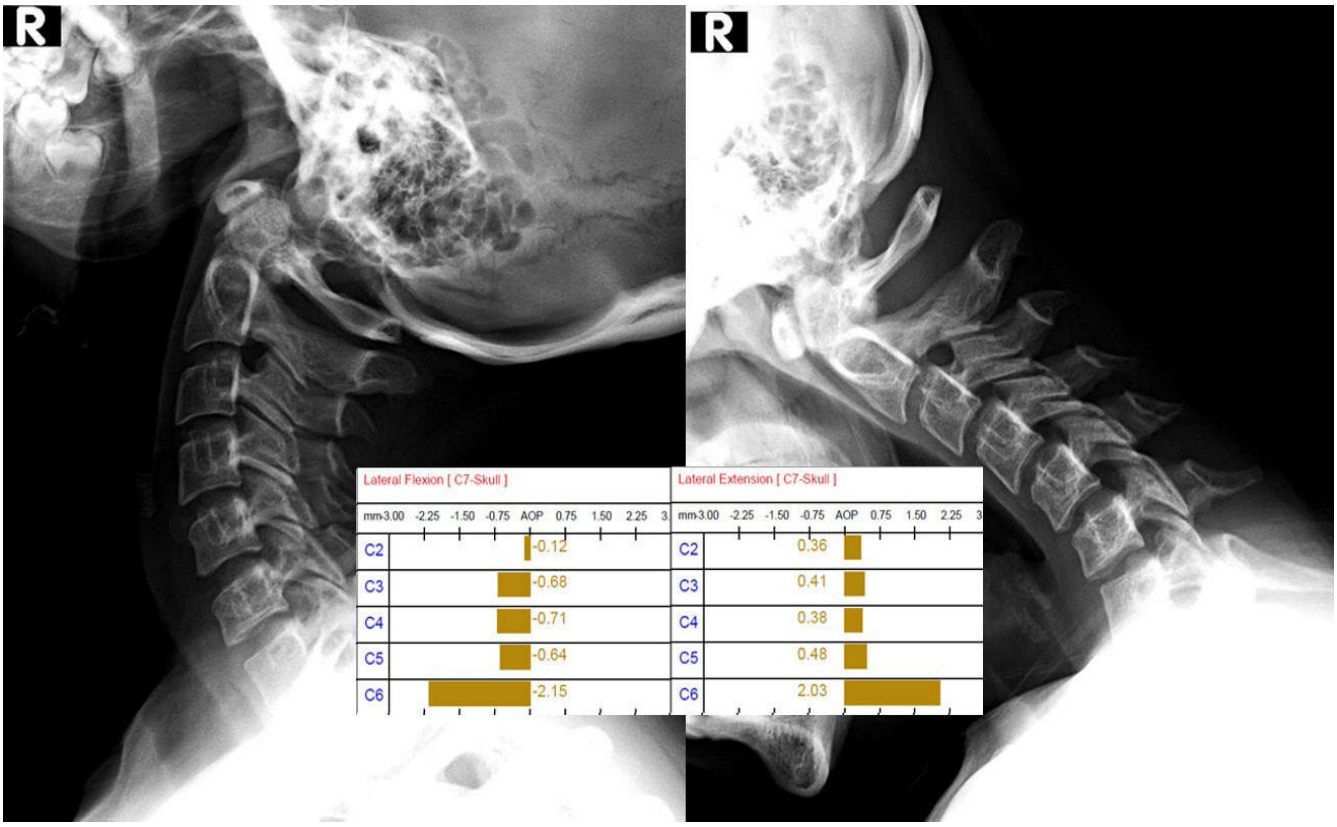
www.thespinalkinetics.com

They have some of the best FREE webinars on the topics of spinal ligament injuries so call them and get signed up with their monthly newsletters.

Here is an example of a typical CRMA report imbedded on a example spine. (These are not the report of the spine you are looking at and are for educational purposes only.)



Based on this CRMA readout this patient would have serious ligament damage at C2. This example shows ligament motion 3.5mm or greater (combined flexion and extension motion at any single level). Per the AMA Guides to Impairment, this rates as a “severe” ligament injury finding, called “alteration of motion segment integrity”.

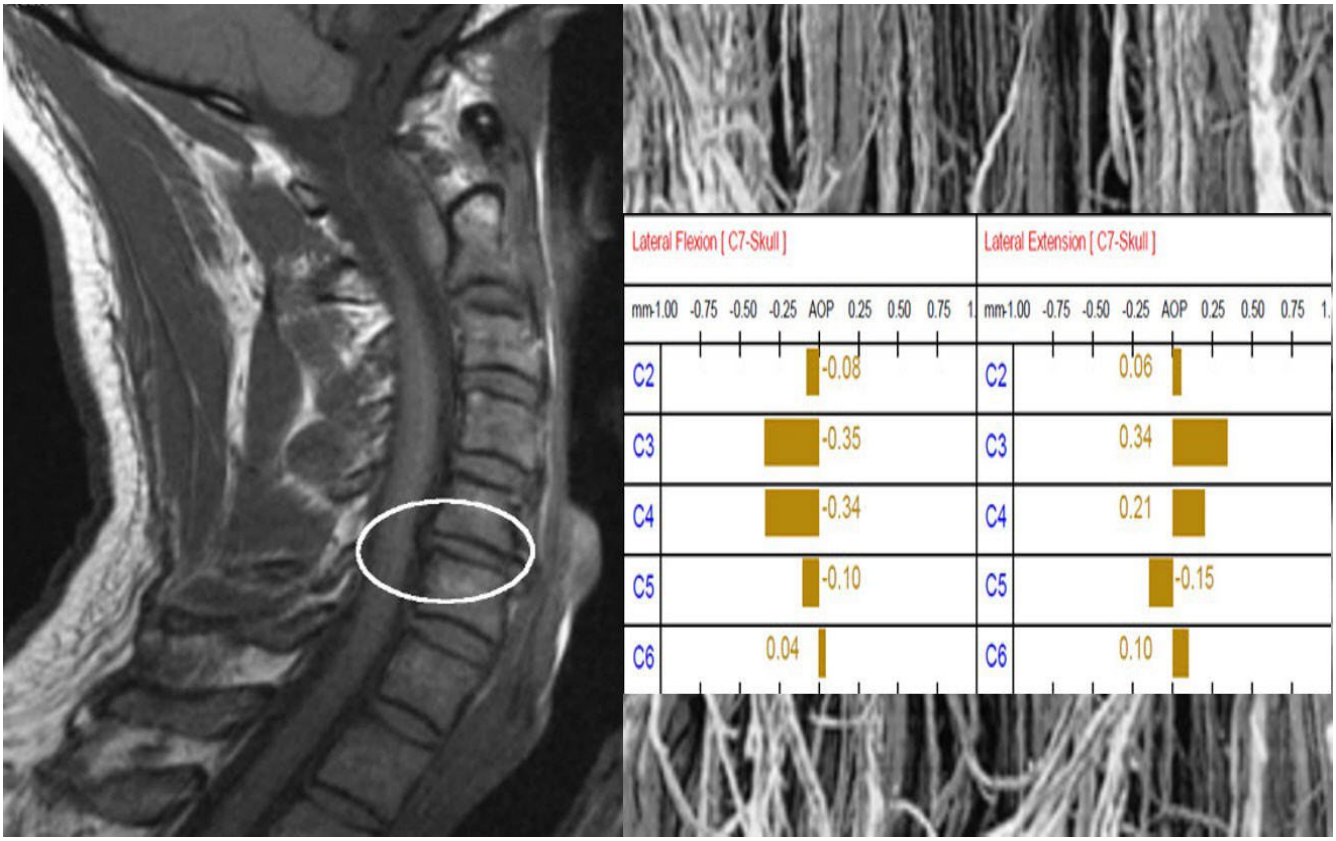


The excessive motion in this one is very problematic at C6. These are severe ligament injuries that never get noted on an MRI. These examples are to show you the power of x-ray in spinal ligament injury assessments. It gives you the ability to accurately assess for spinal instability, their severity and location.

Instability is a very good word for this condition as it means: "a tendency towards unpredictable behavior". Ongoing instability can be the primary reason that people do not fully recover from this type of injury. This may also explain why so many have a problem finding providers that can accurately diagnose it.

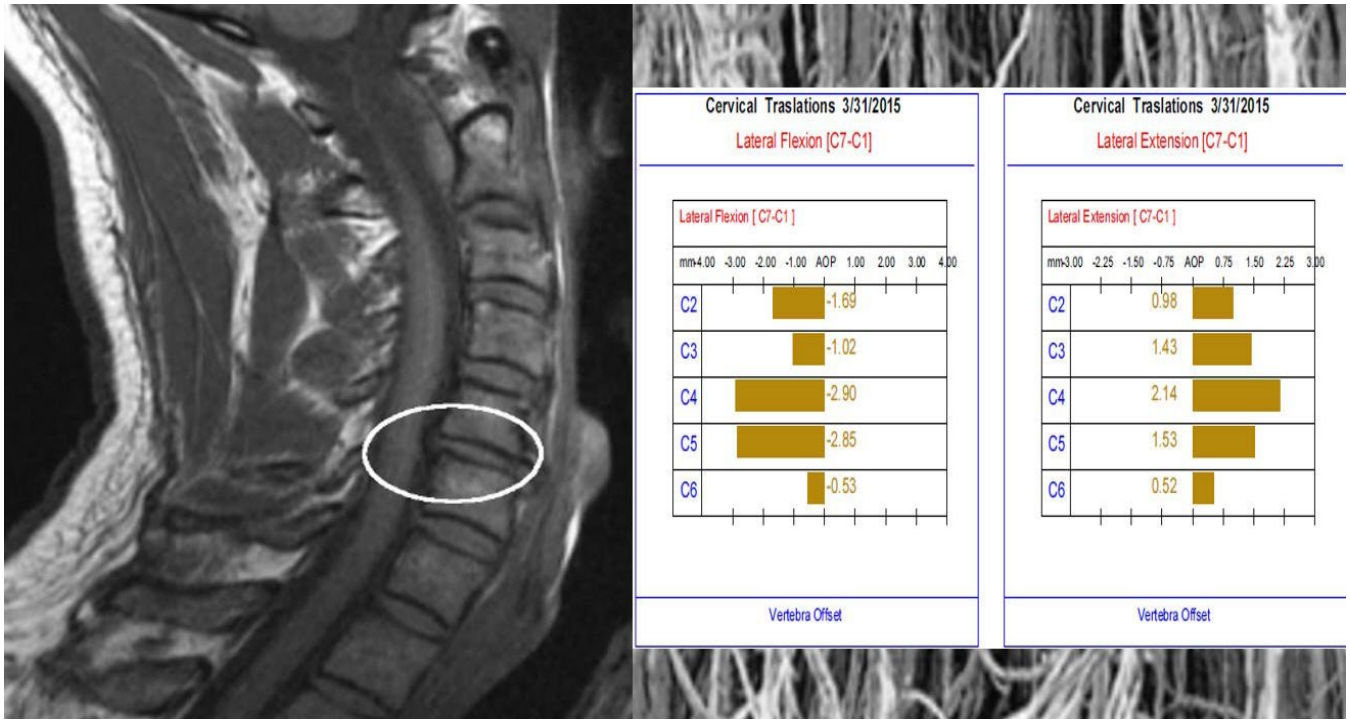
Excessive motion testing is one of the most powerful diagnostic tests that anyone with a spinal ligament injury can have!

Accurately detecting excessive spinal motion is even more powerful in the setting of positive findings of a disc herniation on an MRI. When a patient has a disc herniation the first thing their provider should be thinking about is "how bad is the excessive motion"?" A disc herniation *along with* damage of any of the 9 other ligaments (comprising a spinal motion unit) can result in excessive motion at the same spinal motion unit or at the units above or below the disc herniation. This is a serious, complicated soft tissue injury.



This image shows a bad 5th disc herniation at the level of C5-C6. However as shown in the chart from a CRMA™ excessive motion report, there is no excessive motion at any cervical level: C6-C7 (0.06 mm), C5-6 (0.05 mm), C4-C5 (0.55 mm), C3-C4 (0.69 mm), C2-C3 (0.02 mm). Clinical consensus is that anything over 1mm change (combined flexion and extension at a single level) is considered abnormal.

So in this case this patient has a disc herniation that has no excessive motion associated with it. It was the probably result of a compressive force. These disc herniation's should be more easily resolved than those that have severe excessive motion (indicating the other support ligaments are severely damaged). One injury is far more stable (disc herniation with no excessive motion), than the other (disc herniation with severe excessive joint motion due to severe damage to the other support ligaments).



This shows a herniated disc between the C5-6 vertebral bodies. On the patient's x-ray CRMA™ report, all levels show motion greater than 1mm:

C2-C3 (2.67 mm)

C3-C4 (2.45 mm)

C4-C5 (5.04 mm, severely excessive motion of the unit directly above the disc herniation),

C5-C6 4.38 mm, severely excessive motion at the same level as the disc herniation),

C6-7 is 1.05 mm

The levels just above and at the herniated disc level are most severely unstable.

To summarize the 3 pitfalls with MRI and spinal ligament injury diagnosis:

1. There are 10 ligaments that hold a spinal motion unit together (disc is one of them) and yet the MRI report usually only mentions damage to the disc and nothing else. MRI is generally only reporting on 1/10 of the spinal ligament structure, which leaves the other 90% undiagnosed.
2. MRI is not designed to tell us how much excessive motion damage (instability) the spine has taken from the injury. This omits perhaps the most important finding, as it begins to tell us a lot about the treatments that would be most beneficial and it gives us a great understanding of the time involved with treatment, the expected outcomes and it gives us an early indication of the follow up supportive care the patient may require to maintain the gains from treatment. A disc herniation can be a serious injury, however a disc herniation with no excessive joint movement and one with severe joint movement are two completely different disc herniation's!
3. MRI does not routinely diagnose the severe upper cervical ligament injury

Conclusion

Spinal ligament injuries are some of the most significant injuries that any human body can receive, simply because they put the patient at such high risk for long-term residual complaints. Often these complaints are not accompanied by accurate documentation of physical findings, simply because the doctors that are working with these patients are not aware of what such injuries look like.

In this report, I chose not to focus on such things as MRI signal intensities to pick up ligament damage or other such complicated and often variable procedures. These injuries can be very easily picked up with standard stress radiology there was no need to get any more complicated.

All problems are resolved by applying basics. The purpose of this report was to bring to the forefront the simple imaging procedures that are not being standardly applied today.

Every patient suspected of having a spinal ligament injury should be tested with simple stress radiology and a CRMA™ excessive spinal motion study. I hope that this report was straightforward enough to provide you with a great understanding of why. When patients are not in the hands of doctors that understand their injuries, their clinical outcomes obviously can be questionable. Time matters in these types of injuries, as every day the patient goes without a clear understanding of what they have the greater the risk the patient can wind up with a symptom that becomes permanent. Spinal ligament injuries are permanent, but the symptoms produced do not have to be.

Spinal Kinetics LLC (www.thespinalkinetics.com) performs that specialized CRMA™ excessive spinal motion study on any set of x-rays in the country. We as a company are doing our part.

The American Spinal Injury & Impairment Consultants educates professionals in much greater detail on these injuries. I have developed an online professional training program that can be found at www.smartinjuryeducation.com.

For everyone that in any way assists the injured public, it is my sincerest hope that this information will provide you with the basics of imaging.

I thank you for taking the time to review this material to the end.

Sincerely,

Jeffrey A Cronk, DC JD

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