

Chronic Neck Pain from Whiplash

In this newsletter I will review 2 papers from different Journals. Together, these investigations define a common source of post traumatic neck pain and then offer evidence that chiropractic management may be the most effective treatment for patients with chronic whiplash associated neck pain. The first study was published this year in the **Journal of Biomechanics** (2007;40(10):2299-306). This study looked at the capsular ligament of the cervical spine as a generator of pain. The second study was published in **INJURY** (Volume 27, Issue 9, November 1996, Pages 643-645). The injury study looked at the benefits from Chiropractic treatment on chronic whiplash injured patients.

In the **Journal of Biomechanics** study, the authors make several important observations:

- In whiplash, the “cervical facet joint has been identified as a source of neck pain and is a likely candidate for mechanical injury due to the bony motions of the spine during neck loading.”
- The energy required for ligament yield was about 14% of the total energy required for complete ligament rupture.
- “It has been hypothesized that displacing soft tissue beyond yield results in **permanent** deformation.”
- Ligament changes occur before its rupture and are capable of producing pain
- “Subfailure loading may produce microscopic damage that changes the mechanical properties of the tissue including: increased laxity, decreased stiffness, and altered viscoelastic properties.”
- The current findings from this study provide a biomechanical perspective “supporting capsule stretch as a mechanism of facet-mediated pain and whiplash injury.”
- “While these subfailure distractions may not produce visible ligament tears, detection of the ligament's altered structural response may provide an indication of an injury sufficient to elicit sustained nociceptor firing, pain symptoms, and persistent activity in the nervous system.”

The **INJURY** study was particularly interesting because 2 of 4 authors were the respected researchers Gargan and Bannister. These researches have been investigating the whiplash event for decades and are considered the top in the field. The following are some of their observations:

- 43% of those injured in whiplash will experience long-term symptoms
- “If [whiplash] patients are still symptomatic after 3 months then there is almost a 90% chance that they will remain so.”
- “No conventional treatment has proven to be effective in these established chronic cases.”
- The 28 patients in this study had initially been treated with anti-inflammatories, soft collars and physiotherapy. These patients had all become chronic, and were referred for chiropractic at an average of 15.5 months (range was 3 – 44 months) after their initial injury.

- Following chiropractic 93% of the patients had improved: 16/28 (57%) by one symptom group and 10/28 (36%) by two symptom groups.

So let's tie these studies together and make them applicable in the real world. In the first study, it is demonstrated that even at forces 1/7th the magnitude necessary to rupture the capsular ligament, there are changes that permanently affect the strength, function and pain signaling of the cervical capsules. As a result, patients can develop altered joint mechanics and chronic pain. The second study shows that chronic neck pain (<3 months) from whiplash is not responsive to the conventional approaches. Only after the implementation of a chiropractic treatment program did patients show reduction in symptoms.

Chiropractic treatment of whiplash patients is directed towards restoring normal joint biomechanics via Chiropractic Manipulative Therapy (CMT) and supportive therapeutics (modalities, stretching, strengthening, conditioning, etc). In the spine, movement is performed using the three joint complex including the 2 facet joints and the disc for each motor unit. All of these structures have been proven to be pain productive. It has been demonstrated by prior researchers (ie. Bogduk et al) that 60% of post traumatic neck pain originates from the facet joint. The integrity of the facet joint capsule is essential to maintain normal biomechanics in the cervical spine. CMT, performed by skilled chiropractors, is directed toward restoring facet joint function and stability by mobilizing restricted joints and stabilizing hypermobile joints.

From these studies we learn that the force required to produce permanent injuries in the neck is substantially less than one would suspect. We also learn that the most effective approach to prevent chronic pain is the utilization of chiropractic methods.