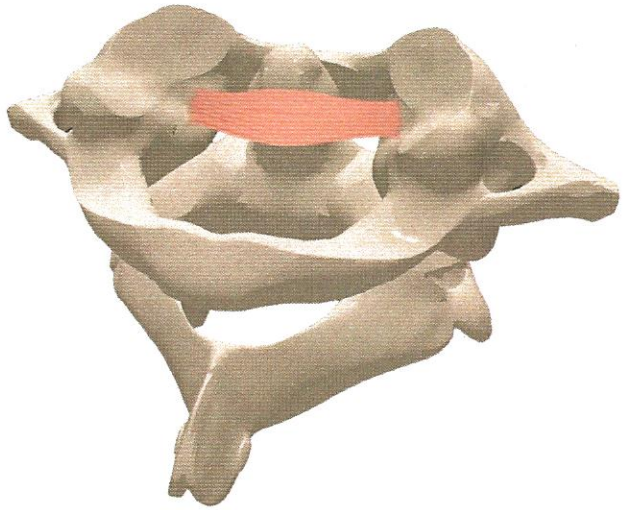
Injury Briefing

A review of the latest studies from Dr. Michael D. Berry.

How Whiplash Alters the Transverse Ligament

Recent research reveals new information about the microtrauma whiplash produces in the ligaments of the neck. A new study from Ulbrich *et al* suggests that the transverse ligament is detrimentally altered during whiplash injury.[1]

The transverse ligament is a strong band stretching across the atlas (C1), or the first vertebra of the cervical spine. As part of the cruciate ligament, the transverse ligament work with vertical fibers and other ligaments to stabilize the neck.



Experimental data of simulated rear-end crashes showed that the craniocervical junction is the most vulnerable region in rear-end collisions.[2] Force applied to the craniocervical junction may therefore have more pronounced consequences for the ligaments and muscles in this region.

Studies of the effects of whiplash on the craniocervical junction have focused on damage to the alar ligaments.[3-4] Fewer studies have tested whether whiplash damages the transverse ligament. Ulbrich *et al* studied how whiplash injury influences the transverse ligament by evaluating patients within the first 48 hours after receiving the injury. Using a variety of MRI imaging techniques they confirmed that whiplash affects the transverse ligament with the following results:

- STIR and VIBE imaging showed significant alterations of the transverse ligament.
- Male whiplash patients had thicker transverse ligaments than healthy participants. Researchers speculated that this is likely due to posttraumatic swelling. Interestingly, this increased thickness was not observed in female patients.
- Significant signal alterations of the transverse ligament was observed on both un-enhanced STIR and VIBE imaging. Researchers explained that this possibly relates to "stretching and microtrauma to collagen fibers of the transverse ligament with edema." These changes were less pronounced however when researchers injected a contrast agent, a substance used to enhance the contrast of structures or fluids in MRI imaging.

La Costa Chiropractic
6986 El Camino Rd Ste F
Carlsbad, CA 92009

This publication is compliments of:

Dr. Michael D. Berry, D.C.
La Costa Chiropractic

To contact Dr. Berry,
call (760) 438-9548.

Dr. Michael D Berry
La Costa Chiropractic
6986 El Camino Rd Ste F
Carlsbad, CA 92009

For more information about our practice,
visit our website at
www.lacostachiropractic.com

Given the minimal changes of the transverse ligament detected in MRI imaging, the authors argued that "upper neck MRI is of limited value in the initial examination of patients with WAD grade I or II and cannot be recommended for routine use in this setting." Instead, MRI imaging of this region may be better suited for studying "injury-related changes." Despite that only small changes in the transverse ligament were detected, gaining a better understanding of the microtrauma ligaments undergo could improve doctors' understanding and treatment of whiplash-associated disorders. Researchers suggested that further research could continue to elucidate the subtle but objective posttraumatic effects of whiplash.

1. *Ulbrich, EJ, et al. Alterations of the Transverse Ligament: An MRI Study Comparing*
2. *Patients With Acute Whiplash and Matched Control Subjects. American Journal of Roentgenology 2011;197(4):961-7.*
3. *Ivancic PC, Panjabi MM. Cervical spine loads and intervertebral motions during whiplash. Traffic Injury Prevention 2006; 7:389–399*
4. *Krakenes J, et al. MRI assessment of the alar ligaments in the late stage of whiplash injury: a study of structural abnormalities and observer agreement. Neuroradiology 2002; 44:617–624*
5. *Krakenes J, Kaale B. Magnetic resonance imaging assessment of craniovertebral ligaments and membranes after whiplash trauma. Spine 2006; 31:2820–2826.*