

## "What Causes Those Symptoms, Doctor?"

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### Introduction:

The symptoms of whiplash or cervical acceleration/deceleration (CAD) injury are very often referred to as "bizarre," particularly by authors not thoroughly familiar with the condition. To describe them in this way may suggest an honest bewilderment or perhaps a trace of skepticism. Other authors, however, have attempted to solve some of the puzzling clinical questions about the strange-seeming constellation of complaints which frequently surround CAD injuries.

Most of us have developed methods of coping with our patients' difficult, but otherwise benign, questions. "Gee doctor, when you pushed on my right knee, I felt it behind my left ear. Why is that?" We then mumble something about how we expected that and then proceed with our examination and treatment of the patient. Don't get me wrong here, I'm not suggesting that your patients' input or questions are not important but there are times ... Other times, however, our patients have legitimate concerns and do require thoughtful answers. When cases are litigated we may find ourselves responding to questions under cross-examination or in a deposition about why a patient is in pain or is dizzy. This article will review what we do know about the signs and symptoms of CAD trauma.

### Symptoms and Signs

Table I list the 14 most frequently described complaints in CAD trauma. Note that some may be related to the postconcussion syndrome, the Barre-Lieou syndrome or TMJ dysfunction.

#### TABLE I

##### Common Symptoms Following Whiplash in Order of Prevalence

Neck Pain

Neck stiffness

Trapezius pain

Headache\* @ +

Interscapular pain

Back pain

Paresthesiae

Extremity pain/weakness

Dizziness/lightheadedness\* @ +

Facial pain and TMJ related symptoms

(clicking, closed lock, etc.) +

Auditory symptoms (phonophobia,

tinnitus, loss of hearing)\* @ +

Vertigo\* @

Ocular dysfunction (blurred vision,  
photophobia)\* @

Dysphagia/hoarseness

\* May be part of PCS

@ May be part of Barre-Lieou syndrome

+ May be part of TMJ dysfunction

Neck pain is easily explained by tearing of any soft tissue, disc injury/herniation or end plate fracture. Immediate pain indicates more severe injury. Stiffness is usually the result of muscle spasm. Shoulder pain may be the result of direct shoulder injury or referred pain from cervical disc injury (discogenic pain) or soft tissue injury (sclerotogenous pain). Headaches can result from injury to the upper cervical spine, reflex muscle spasm, TMJ dysfunction, the Barre-Lieou syndrome (rarely) or direct brain injury (i.e. postconcussion headaches). They may also have a vascular origin.

Interscapular pain may be due to direct injury to paraspinal muscles in this area but most often is due to muscle spasm or referred (sclerotogenous) pain from cervical soft tissues or from cervical discs.

Later onset indicates myofascitis. Croft and Foreman<sup>1</sup> found low back pain (LBP) in 57 percent of their CAD cases (71 percent in broadside collisions) while Braaf and Rosner<sup>2</sup> noted LBP in 42 percent of their cases. Hohl<sup>3</sup> described LBP in 35 percent of his cases. It is interesting though that in a long term follow up study of CAD victims, Watkins et al.<sup>4</sup> found that while only 24 percent initially complained of LBP, after a mean of 10.8 years, 34 percent had LBP. Precise interpretation of this is difficult.

While parathesiae are usually blamed on direct nerve injury or irritation, thoracic outlet syndrome (which is probably an advanced manifestation of myofascitis) and sclerotogenous pain can be associated with paresthesiae. Other causes include sympathetic disturbance and spinal cord injury. Extremity pain and weakness may be explained in the same way. Braaf and Rosner<sup>2</sup> found sciatica in 15 percent of their cases.

It has been shown that dizziness and lightheadedness can be produced by injection of saline solution into the SCM muscle<sup>4</sup>. Muscular injury or vascular compromise due to increased sympathetic tone may have the same effect. Inner ear damage, such as a perilymph fistula, or a minor brain injury, may give the same symptom. Tinnitus may be the result of inner ear injury, TMJ injury/derangement or (rarely) Barre-Lieou syndrome. Phonophobia typically accompanies minor head injury. Vertigo usually indicates a labyrinthine pathology or brain stem disorder, although it can be due to ischemia. Short duration vertigo (5-10 sec.) associated with quick movements of the head is referred to as benign paroxysmal positional nystagmus (BPPN). This may be due to free floating otoconia which have been detached from the otolithic membrane. With abrupt movements of the head, they are swept up in the current of semicircular canal, causing displacement of the cupola. The resulting barrage of impulses causes BPPN, a condition sometimes referred to as cupolithiasis<sup>5,6</sup>.

Pupillary dilatation will often result in blurred vision and is generally the result of injury to the sympathetic system. Note that interruption of sympathetic fibers results in miosis e.g., Horner's syndrome. Irritation has the opposite effect. Nystagmus implicates the vestibular apparatus.

Photophobia is common with mild head injury. Hildingsson et al.<sup>5</sup> have proposed dysfunction of the proprioceptive system of the cervicocranial region as an explanation for visual tracking (smooth pursuit) abnormalities.

Dysphagia and/or hoarseness often is the result of swelling/spasm of the longus colli -- one of the chief culprits in straightening of the cervical lordotic curve. However, retrotracheal or retropharyngeal hematoma may give the same symptoms and should prompt immediate investigation. Hoarseness may also reflect direct laryngeal injury or injury to cranial nerves (brain stem lesions) or the recurrent laryngeal nerve.

Most often in CAD trauma, facial pain is due to a TMJ disorder (a.k.a. TMD). Associated clicking, popping, locking, limited opening, deviations, deflections, and palpable pain should prompt TMJ evaluation/referral.

Remember that delayed onset of symptoms is quite common following CAD trauma. Classic and contemporary writings have reflected this<sup>6-13</sup>. Some authors have described delays of months or even years<sup>2</sup> although some of these conditions represent secondary adaptations to otherwise minimally symptomatic or asymptomatic conditions. Physicians who are cognizant of these numerous conditions and their protean manifestations will be best equipped to manage CAD trauma not only from the standpoint of diagnosis and treatment but also for medicolegal reasons.

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Editor's Note:

If you are looking for more information on personal injury, consult Dr. Croft's video "Advances in Personal Injury Practice," #V-435 on the Preferred Reading and Viewing List, pages XXX.

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