

## Chronic Spinal Pain Posttrauma; Whiplash

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I recently completed a deposition for a plaintiff in a civil case. Within 48 hours of my deposition, the defense attorney settled with the plaintiff. The plaintiff's attorney, whom I had worked with on previous accident case analyses, had requested my assistance to evaluate the trauma his client suffered when his car was rear-ended on the freeway and pushed into the car in front of him. It was a four-car accident, and his client's vehicle required towing. His client had residual neck and back pain, and had been in another motor vehicle accident 10 years prior. As I reviewed the medical records, I noticed that the opposing doctor, an orthopedist, mentioned in reviewing the chiropractic treatment plan: "If chiropractic manipulation were chosen, I feel that manual manipulation might have some value for a limited period of time, perhaps for a *month*."

Next came the common cry: "Chiropractic overutilization!" (Honestly, I can never understand why an attorney would hire an "expert" who is not knowledgeable about chiropractic practice parameters!) This expert claimed there was never any necessity for daily treatment. He concluded that the treatment from the plaintiff's chiropractor was "far in excess of any that was reasonably needed to lessen or resolve any symptoms resulting from this accident."

Representatives of third-party payers, I have found, generally attack chiropractic on the grounds of overutilization based on misinformation, rather than common practice patterns of doctors of chiropractic within the community. There is ample information available in the chiropractic literature to give assistance to anyone engaged in one of these disputes.

The opposing medical doctor also remarked about the plaintiff: "I cannot account for his intermittent neck complaints. After my examination today, I see no reason why his neck complaints would not resolve if he were to carry out range-of-motion and stretching exercises for his neck to end ranges of motion in all directions on a daily basis."

The plaintiff had residual neck pain and back pain (primarily when moving) that was intermittent 14 months posttrauma. I offered the following information and arguments.

### Myofascial Pain Syndrome, Fibrosis and Chronic Pain

Neck pain is easily explained by tearing of any soft tissue, disc injury or herniation, or endplate fracture. Immediate pain indicates more severe injury. Shoulder pain may be the result of a direct shoulder injury, or referred pain from cervical disc injury (discogenic pain) or soft tissue injury (sclerotogenous pain). Intrascapular pain may be due to direct injury to the paraspinal muscles in this area, but most often is from muscle spasm or referred (sclerotogenous) pain from cervical soft tissues or discs. Later onset indicates myofascitis.

One of the more common pre-existing problems seen in patients is a varying degree of subclinical or clinical myofascial anatomic alteration acquired from prior trauma. Fibrosis is an alteration of the normal structural and functional capacity of a group of muscles that are not normally pain-sensitive. These areas usually involve the postural muscles: trapezius, rhomboid, scapulae scalene and paraspinals. The patient develops pre-existing excessive scar tissue formation in these

regions. Symptoms as discussed in fibrosis may be asymptomatic before a car crash. Myofascial pain, or fibromyalgia, is a common sequela of neck injury.<sup>1,2</sup>

Myofascial pain syndrome (MPS) is probably the most common source for chronic neck, head, and upper dorsal (back) pain following a motor vehicle injury.

Cervical Sprain: What Structures Really Are Involved?

This study<sup>3</sup> mentions the effectiveness of a new sensor that measures ligament length during motion testing. The researchers took a cadaver spine, measured the range of motion of the right C6/C7 capsular ligament, and simulated whiplash. The maximum normal elongation for the ligament occurred during left side bending at 7.2 mm. During whiplash conditions, the recorded lengths are exceeded up to 8.2 mm. The significance is twofold; a collision of six miles per hour can result in G-forces of 6.5g, which can produce ligament stretching greater than 7.4 mm, but less than 7.8 mm. The result is excessive loading to the spinal ligaments.

This report<sup>4</sup> discusses six patients with third cervical root ganglion compression after whiplash accidents. C3 compression was diagnosed by location of symptoms (pain from the neck, behind the ear, suboccipital,) and worsening of symptoms upon cervical motion. Surgical decompression of C3 was preformed in all patients. The symptoms cleared after surgery, indicating that C3 compression was indeed causation. The author concluded that as with other compression neuropathies, all efforts should be made to treat the patient conservatively, due to the high rate of complications related to surgery.

This study<sup>5</sup> mentions the role of the cervical zygapophysial joint pain as a result of whiplash injuries. The authors report: In half of the patients with chronic neck pain, post whiplash, the pain originates in the zygapophysial joints. It cannot be diagnosed clinically or on x-ray, but can be identified by using local anesthesia to block the nerves supplying the painful joint. In this study, the researchers had examined the effectiveness of percutaneous radio frequency in treating painful cervical zygapophysial joints in patients who had pain an average of 34 months.

Spondylosis Posttrauma and Anterior Vertebral Compression Fracture

Back to my case: The opposing side's doctor's report remarked upon the plaintiff's residual upper back symptoms with the following: "I cannot account for his left upper back symptoms. I do not feel that the slight wedging and spurring in the thoracic spine, as seen on x-ray, accounts for these symptoms. If he were coming to my office for treatment, I would have him carry out daily stretching for his shoulder girdles as well as his upper back, in hopes that this complaint would resolve."

It sounded like he was describing spondylosis, and I questioned the causation of the wedging and whether these entities might have been traumatically induced.

An argument was made in discussion of spinal anatomy that anterior and posterior longitudinal ligaments bind the intervertebral disc. They're attached to the vertebra above and below by cartilaginous plates and by a great number of strong, minute fibers - Sharpey's fibers - that attach into the bony substance of the vertebral body. One of the functional responsibilities of discs is to serve as shock absorbers and adaptive cushions of compensatory necessity.

The synovial joints are the storm center of the spine. (The capsule and lining of the zygapophysial joint are supplied by proprioceptors and sensory nerves.) Ligaments, especially the posterior, have

a copious innervation of sensory fibers, so a radiating pain may occur from irritation of this tissue. Discs are essentially nonpain-sensitive tissue. The outermost layers of the annulus fibrosus are attached to the surface of the vertebral body (Sharpey's fibers). Stress/trauma weakens these fibers and the anchorage of the disc to the spinal body, leading to spondylosis.

X-rays of his upper back obtained 14 months posttrauma showed a slight increased dorsal kyphosis that appeared to be due to wedging of T4 and T5, associated with a slight spurring anterior to the disc spaces in this area. My medical record review had determined that the plaintiff's x-rays obtained at the emergency room, as read by the medical radiologist, failed to demonstrate the presence of thoracic wedging, or spondylosis at the immediate time of injury. The chiropractic and medical literature reports that wedging is a change in vertebral anterior body height that may be brought on by trauma. The wedge deformity is a well-known radiographic sign of vertebral compression fracture, where the anterior depression of the vertebral body has a 30 percent or greater loss in height.

One plausible explanation for the many cases of chronic neck and back pain in the absence of ongoing injury or inflammation is described by researcher Chan Gunn. He notes that symptoms are caused by a functional disturbance, or pathological changes in the peripheral nervous system of the nerve roots. This disturbance may also induce perineural and intraneural (around and between nerves) fibrosis. There is a "denervation supersensitivity" reported in the medical literature, described as an increased sensitivity in the peripheral nervous system. The most frequent abnormality associated with this at the nerve root level is spondylosis. Spondylosis includes both structural and morphological alterations that occur in the disc and the pathoanatomic changes that occur in the surrounding tissues. Spondylosis is a degenerative process that many medical authors believe begins in the intervertebral discs.

It appeared that some of the opposing doctor's statements were contrary to the understanding of how the majority of the current literature characterizes the symptoms and signs of the whiplash syndrome. Manifestations may be subtle, and therefore frequently overlooked, or not evaluated at all by clinicians who do not understand these concepts.

### *References*

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