Whiplash injury, TOS and double crush syndrome
Forensic medical aspects


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FROM ABSTRACT:

In this article the author wants to specify that the whiplash syndrome is underestimated, even by specialists.

In particular, the complications aren’t taken into correct consideration, above all if they concern the brachial plexus, especially regarding the TOS syndrome and double-crush syndrome.

This is a problem also among the experts who have to make an evaluation in the field of insurance.

THIS AUTHOR ALSO NOTES:

"Whiplash injury (WI) is characterized by a collection of symptoms that occur following damage to the neck usually as a result of a sudden strain affecting the discs, muscles, nerves, or tendons of the neck caused by a sudden acceleration or deceleration of the head and neck."

"The head is violently thrown back, forwards or sideways followed by reflex contraction in the opposite direction."

"Swelling and inflammation occur due to damage caused by the rapid movement which leads to pressure being placed on the nerves, often resulting in the classical symptoms of whiplash."

"Symptoms following an accident may be present immediately or may develop gradually over hours, days, or weeks after the injury." [Important]

"Pain and stiffness is caused by pressure being placed on the nerves as a result of tissue swelling which causes muscle spasm."

Typical Signs and Symptoms Following Whiplash Injury Include:
1) Single or multiple cranial nerve palsies
2) Peripheral neuropathy
3) Dizziness and otoneurological disorders
4) Thoracic Outlet Syndrome (TOS)
5) Visual disturbances
6) Post-traumatic sympathetic dystrophy
7) Double crush or multiple crush syndrome
8) Discopathy
9) Rim lesions [separation of the disc from the cartilaginous end-plate
10) Spinal cord injury
11) Retropharyngeal hematoma
12) Damage to the subarachnoid space
13) Mediastinitis
14) TMJ injury
15) Hypopharyngeal, tracheal, or esophageal perforation. [IMPORTANT]
16) Brain injury
17) Hypothalamic-pituitary-thyroid axis disorder
18) Damage to the sympathetic nerves [IMPORTANT]
19) Menstrual Disorders

A substantial percentage of people will have whiplash symptoms for more than a few months, “especially the elderly or those with pre-existing neck problems who may develop chronic long-term problems which may never resolve.” [IMPORTANT]

Studies demonstrate that whiplash symptom persistence or worsening occurs even when litigation issues have been resolved. [IMPORTANT]

Seatbelts may increase the incidence of a whiplash injury. [IMPORTANT]

Following whiplash injury:

62% to 100% have neck pain
82% have headaches, usually suboccipital
35% to 42% have thoracolumbar back pain
45% have paresthesia of the upper extremity
7% to 18% have dysphagia
12% to 20% have overt upper extremity motor, reflex, and/or sensory neurologic signs.

Other reported post-whiplash symptoms include dizziness, vertigo, visual disturbances, auditory disturbances, and cognitive impairment.

Many patients have sensations of tingling and numbness in the hands, particularly of the ulnar two fingers, without overt neurologic signs. “The paresthesias may be due to thoracic outlet syndrome arising from stretch or compression of the lower cords of the brachial plexus as they pass between the scalenus anterior muscle and the scalenus medius muscle, and under the clavicle.”

“That injury can cause a fibrosis of the plexus because of the change of microenvironment of the nerves.” [IMPORTANT: The Fibrosis of Repair]

Trauma to the peripheral nervous system causes epineural, perineural, and endoneural edema.
This edema stimulates the “production of connective tissue which eventually might lead to endoneurial scar tissue.” [Again, The Fibrosis of Repair]

More severe peripheral nerve trauma may cause proliferation of fibroblasts, increased collagen production and endoneurial fibrosis at the site of the lesion, leading to symptoms and dysfunction. This process can take several weeks. This delay in symptoms may be rejected by medical examiners [who do not understand this pathophysiology] in their medical reports. [Very Important]

The double or multiple crush syndromes occurs when a proximal nerve irritation increases peripheral nerve problems. Examples include cervical radiculopathy increasing the risk of thoracic outlet syndrome or carpal tunnel syndrome; or a thoracic outlet syndrome increasing the risk of carpal tunnel syndrome.

“After a whiplash injury, patients may suffer from a double crush syndrome. The symptoms are similar to carpal tunnel pathology and/or thoracic outlet syndrome pathology.” Cervical disc disease predisposes patients to carpal tunnel syndrome as well as thoracic outlet syndrome. [Important]

“Double crush can be seen post traumatically after whiplash injury. A hand specialist may overlook a double crush syndrome originating in the neck. Treatment by surgical release of the carpal tunnel syndrome is frequently unsuccessful in the long term because of the unrecognized presence of more proximal compression neuropathy.” [Very Chiropractic]

Thoracic outlet syndrome is usually produced by hyperextension or side impact neck injuries.

When the neck in hyper-extended, “the scalene muscles, which hold the neck in place, are torn, causing blood and other fluids to leak into the brachial plexus injury. This causes scar tissue in the brachial plexus.” [IMPORTANT: The Fibrosis of Repair]

Insurance companies often deny the link between the symptoms of TOS and a motor vehicle accident because:

1) X-rays, MRI, and CT usually fail to show the pathology in TOS.
2) Electrodiagnostic studies may be normal.
3) The symptoms are often delayed.
4) The primary symptoms are not in the neck.
KEY POINTS FROM DAN MURPHY

1) The whiplash syndrome is underestimated, even by specialists and especially by insurance company doctors.

2) The tissue damage caused by whiplash results in the sequence of swelling, inflammation, and fibrosis. This puts progressive pressure on nerves, which causes muscle spasm and stiffness.

3) Whiplash symptoms may be delayed for hours, days, or weeks after the injury. [Important]

4) A substantial percentage of people have whiplash symptoms for more than a few months, especially the elderly or those with pre-existing neck problems that develop chronic long-term problems, which may never resolve. [IMPORTANT]

5) Whiplash symptoms persist or worsen even when litigation issues have been resolved. [IMPORTANT]

6) Seatbelts may increase the incidence of whiplash injury. [IMPORTANT]

7) The typical presentation of thoracic outlet syndrome is tingling and numbness in the hands, particularly of the ulnar two fingers, without overt neurologic signs.

8) The pathology of thoracic outlet syndrome is fibrosis of the nerve plexus that changes the microenvironment of the nerves.

9) Post-traumatic thoracic outlet edema stimulates the production of connective tissue that eventually leads to endoneurial scar tissue.

10) Post-traumatic endoneurial fibrosis can take several weeks to develop and for symptoms to occur. [I have an article from the journal Trauma, August 1994, that says post-traumatic carpal tunnel fibrosis and symptoms can be delayed for as long as two years.]

11) Thoracic outlet syndrome may exist secondary to an undiagnosed cervical spine radiculopathy, the Double Crush Syndrome.

12) Thoracic outlet syndrome may increase the incidence of carpal tunnel syndrome because of Double Crush Syndrome.

13) Carpal tunnel surgery may fail because of an unrecognized cervical spine thoracic outlet Double Crush Syndrome.

14) Thoracic outlet syndrome is usually produced by hyperextension or side impact neck injuries.