Delayed onset of Lhermitte’s sign following head and/or neck injuries

Report of four cases

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The authors report four patients who suffered the delayed onset of Lhermitte’s sign following head and/or neck trauma with no significant neurological deficits. The average onset from the time of the injury was 2.8 months. In all patients, there was a full range of movement of the cervical spine with no tenderness and no neurological deficits. Myelography was performed in three of the four patients and was normal. The duration of Lhermitte’s sign ranged from 4 months to 1 year (mean 8 months). Complete recovery occurred in all cases. The pathogenesis, differential diagnosis, and management of patients with Lhermitte’s sign are discussed.

KEY WORDS • Lhermitte’s sign • head injury • neck injury • myelography • cervical spine

Lhermitte’s sign, which consists of sudden electric shock-like or painful sensations spreading down the body or into the limbs on flexion of the neck, has been reported in patients with cervical cord tumors, cervical spondylosis, radiation myelopathy, and multiple sclerosis.1,3,8,9 In 1971, Leaver and Loeser6 reported 26 cases of Lhermitte’s sign among 56 patients with high-velocity missile injuries of the brain sustained during the Vietnam War. However, this sign has not been described in the English literature following head and/or neck trauma in civilians. This report describes four patients with Lhermitte’s phenomenon, which occurred within a few months of head and/or neck injuries in the absence of any other underlying etiology.

Case Reports

Case 1

This 45-year-old workman was plastering on a scaffold about two stories high on December 5, 1978, when he fell off and landed on his interscapular region. No loss of consciousness was reported, but he complained about pain in the back of his head and neck. Physical examination showed slight right periorbital swelling with subconjunctival ecchymosis. The C4–5 area was tender to palpation posteriorly, and there was paravertebral cervical muscle spasm. Neurological examination was normal. Skull x-ray films showed a vertical linear undisplaced fracture of the right frontal bone extending inferiorly to the middle of the supraorbital margin. Cervical spine x-ray films revealed an oblique fracture of the spinous process of C-5. He was discharged 5 days later with a persistent dull aching neck pain but with a full range of motion in the cervical spine.

Three months following discharge from the hospital he began to experience an electric shock-like sensation that ran down his trunk, arms, and legs to the level of his toes when he bent his head forward. Sometimes it was accompanied by numbness of his left leg. This became more noticeable when he was driving his car, but disappeared as soon as he straightened up. Lhermitte’s sign was reproduced in our office following 15° of forward cervical flexion. The patient was readmitted to the Vancouver General Hospital on April 1, 1979, for cervical myelography, which was normal. In July, 1979, he reported complete resolution of the Lhermitte’s sign and had returned to work as a plasterer.

Case 2

This 24-year-old dentist was a front-seat passenger in a car that was struck broadside on the passenger side on July 14, 1979. She was thrown to the sidewalk and...
rendered unconscious for a few minutes. Physical examination shortly after the accident revealed lacerations of the right eyebrow, forehead, and occiput. There was a boggy swelling of the left mastoid region with a left hemotympanum. She was drowsy but easily arousable and was oriented to name but not to place or time. The cranial nerves, with the exception of the olfactory nerves, were normal. She moved all four limbs symmetrically but did not obey commands consistently. Her reflexes were brisk, with the right possibly slightly greater than the left. Both plantar responses were flexor. Skull and cervical x-ray films did not show any bone fracture, and a computerized tomography brain scan was normal. She made an uneventful recovery and was discharged 4 days after the accident. Two weeks later, she was seen in our office with complaints of dizziness, vertigo, tinnitus in the right ear, and loss of the sense of smell. Examination failed to demonstrate any neurological deficit except for bilateral anosmia. Most of these symptoms cleared in the subsequent 2 months and she returned to work.

On October 29, 1979, 3½ months after the accident, she began to have an electric shock-like feeling in the arms radiating to all her fingers, and in the trunk and legs down to the toes, upon neck flexion. She also had a tingling sensation in her fingers which increased when she flexed her neck. This made it difficult for her to manipulate the dental instruments. She was readmitted to the Vancouver General Hospital. Lhermitte's phenomenon was reproduced with neck flexion of about 45°, but she had full range of movement in her neck. There was no tenderness in the entire spine. Neurological examination was normal. Cervical myelography, including a foramen magnum view, was normal. She had normal cerebrospinal fluid (CSF) protein electrophoresis. Visual evoked responses, brain-stem auditory evoked potentials, and somatosensory evoked responses were all within normal limits. Follow-up assessments revealed a gradual decrease of Lhermitte's sign, with final resolution in April, 1980. In the following year, she gave birth uneventfully to a healthy baby and was functioning as a full-time dentist at the time of the last follow-up examination in April, 1983.

Case 3

This 31-year-old oil-rig worker was struck under the chin on February 14, 1980, by a plank which was blown up from the well by the force of escaping gas. No loss of consciousness was reported. He sustained a comminuted fracture of his right zygoma, a Le Fort II fracture, and a comminuted fracture of both necks of the mandible, with subluxation and dislocation of the condylar heads. Open reductions of the right zygoma and parasymphysial mandibular fractures, application of arch bars, intermaxillary fixation, and tracheostomy were carried out uneventfully. A large posterior pharyngeal split was examined by the otorhinolaryngologist. Conservative treatment was adopted, and he made an unremarkable recovery.

Four weeks after the injury, he first noticed paresthesias extending down all four limbs and in his trunk upon neck flexion. This persisted for about 8 months prior to his second admission to the Vancouver General Hospital. He recalled distinctly an episode where his hands became tingly and weak to the point that he could not hold onto the steering wheel of his car. Both of his thumbs and the index fingers were numb. Slight improvement was noted following cessation of heavy coffee drinking. Sphincter function was normal.

On examination, there was no cervical tenderness. Flexion of the neck reproduced paresthesias in his trunk and the anterior aspect of both thighs. He had a full range of motion of the neck and the back, without pain. Straight-leg raising was 90° bilaterally. Neurological examination showed normal cranial nerve function, including funduscopic assessment. Motor, sensory, and reflex testing of both upper and lower limbs was within normal limits. Abdominal reflexes were brisk, and both plantar responses were flexor. He had no signs of median nerve entrapment. Tinel's and Phalen's signs were absent.

Cervical spine x-ray films, including flexion and extension views, were normal, as was cervical myelography. The CSF protein level was 43 mg% with 6% gamma globulin, and CSF electrophoresis was normal. Follow-up assessment revealed complete resolution of the Lhermitte's phenomenon 4 months after discharge from this hospital.

Case 4

This 25-year-old right-handed computer word-processing instructor was struck by a car as she was walking on November 27, 1981. She suffered loss of consciousness for 1 to 2 minutes. Physical examination was normal except for an occipital laceration. Skull and cervical spine x-ray films were negative. She was discharged following 24 hours of observation. In early February, 1982, she developed an odd feeling in her back, spreading down both upper limbs so that her hands would become numb and she would drop objects held in her hand. This occurred only when she flexed her neck. It was also accompanied by some numbness of the anterior aspect of both thighs. No associated weakness or sphincter disturbances were noted. On neurosurgical consultation in May, 1982, she had already improved to the point that her symptoms occurred only toward the end of the day. The numbness in the fingers was mild and she no longer dropped objects unexpectedly. Examination of the neck showed a full range of motion. On maximum neck flexion, she complained of some "funny feeling" down the middle part of her back. The rest of the neurological examination was normal. Cervical spine x-ray films showed minimal narrowing of the C5–6 disc space with mild
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osteoophyte formation. Myelography was not performed. The Lhermitte’s sign finally resolved in December, 1982.

Discussion

A sudden electric shock-like sensation traveling down the spine to the legs and feet on flexion of the neck was described by Jean Lhermitte in 1932, and has since been referred to as Lhermitte’s “phenomenon” or “sign.” It is frequently encountered in patients with multiple sclerosis, but, according to Kurtzke, et al., has been overemphasized in these cases. It is not only an occasional complaint but also far from specific. Indeed, it has been reported in patients with upper cervical spinal cord tumors, cervical spine degenerative disease, or radiation myelopathy, and has occurred following high-velocity missile injuries to the brain. However, civilian trauma has not, to our knowledge, been reported to cause this sign.

In the cases presented here, the patients were all healthy before the accident. Head injury with skull fracture or mandibular and maxillary fractures were found in Cases 1 to 3, and transient loss of consciousness occurred in Case 4. No significant neurological deficit was encountered. The onset of Lhermitte’s phenomenon varied from 4 weeks to 3½ months following the trauma, with a mean of 2½ months. This is similar to the 7-week duration reported by Leaver and Loeser following high-velocity missile injuries of the brain. Examination showed a full range of movement of the neck and back in all four of our patients. Myelographic studies, which were performed in three of the four patients, failed to demonstrate spinal cord compression or root sleeve amputation. Cerebrospinal fluid electrophoresis was normal in both cases in which the study was performed. The duration of Lhermitte’s phenomenon ranged from 4 months to 1 year, with a mean of 8 months. Complete recovery occurred in all cases. Spontaneous resolution was also reported by Leaver and Loeser.

The basic pathogenesis of Lhermitte’s sign is not settled. In 1964, Biemond used the term “contusio cervicalis posterior” to describe a reversible syndrome following spinal cord trauma. It was characterized by pain and tingling in the neck, upper arms, hands, and trunk and occurred immediately after an injury. The distribution was usually symmetrical and the pain was usually burning in character. Biemond hypothesized that hyperextension was the probable causative mechanism and localized the lesion to the posterior horns of the spinal cord. One of his patients who suffered “contusio cervicalis posterior” died unexpectedly. Autopsy revealed perivascular bleeding surrounded by a zone of edema in a posterior horn. The mode of injury in our Case 3 favored hyperextension as the cause for the Lhermitte’s phenomenon. Gilroy and Meyer believed that traction on the posterior column of the spinal cord by stretching of the nerve roots during flexion of the neck is responsible for the Lhermitte’s sign. Leaver and Loeser concluded that cervical subarachnoid adhesions produced by high-velocity missile injuries to the brain transmit abnormal tension to the cervical and medullary region and thereby cause Lhermitte’s phenomenon upon anteflexion of the head. A similar explanation may apply in our patients, although the head injuries in our series were relatively mild and would not be expected to result in cervical subarachnoid adhesions.

Multiple sclerosis is included in the differential diagnosis of Lhermitte’s phenomenon, but there was no history of optic neuritis or disseminated neurological lesions in any of our patients. Neurological examinations in all four cases, CSF electrophoresis in Cases 2 and 3, and visual evoked potentials in Case 2 were all normal. There was no evidence of cervical cord compression in the three myelographic studies performed. The presence of minimal narrowing of disc space and mild osteophyte formation in Case 4 was thought to be clinically insignificant.

From the management standpoint, cervical spine radiographs are required to rule out cervical spinal fractures or subluxations. The films should be analyzed carefully for the presence of a congenitally narrowed spinal canal, which predisposes to spinal cord compression. Myelographic study is indicated whenever traumatic intervertebral disc prolapse, with or without spinal cord compression, is suspected clinically. However, there appears to be a population of patients who develop Lhermitte’s phenomenon weeks to months after relatively mild head or cervical trauma, in whom the problem is benign and self-limiting. In these cases, where there is no neurological deficit, no neck pain or limitation of movement, nothing in the history to suggest multiple sclerosis, and no evidence of narrowing of the cervical canal or subluxation on cervical radiographs, it may be reasonable to refrain from performing myelography and to follow the patient closely with the expectation that the problem will resolve spontaneously. Myelography may be reserved for those patients whose condition does not start to improve after about 3 months, or for those who deteriorate, with the development of neurological deficit.

Acknowledgments

The authors wish to thank Dr. Felix A. Durity and Ms. Marie Kendall for their assistance in the preparation of this paper.

References


Manuscript received June 30, 1983.
Accepted in final form September 26, 1983.
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