SENSATIONS OF ELECTRIC SHOCK ON FLEXION OF THE NECK AS A SIGN OF HEAD INJURY*

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Most of the head injuries seen in war time appear to be well localized. A penetrating bullet or piece of shrapnel may lodge in the brain tissue and consequently produce signs of local damage. However, it must be borne in mind that a blow by a missile sufficiently violent to penetrate the skull will also produce a general alteration in intracranial dynamics and neuronal function so that damage to the brain is usually much more widespread than the clinical signs would indicate. The varieties of gross and microscopical changes found in cerebral contusion and concussion have been fully described. The pathological physiology of intracranial injuries has also been amply investigated. All these studies indicate that parts of the brain far removed from the site of the main injury reveal significant alteration in the neurons and axis cylinders.3

Recently in a series of head injuries studied at the U. S. Naval Hospital, San Diego, California, we found 17 patients who manifested a well known sign of spinal cord disease.§ This sign, “electric-shock” or vibratory sensations (pallesthesiae) in the extremities and trunk, elicited on forward bending of the head, was found in patients with cranial trauma. The sign is part of a syndrome that has the following characteristics: the patients complain spontaneously of “electric shocks,” “buzzing,” “tingling,” or “vibrations”; the symptoms appear from 3 to 16 weeks after the injury and may last from 2 to 20 weeks; as a rule the vibratory sensations are bilateral and symmetrical in distribution, and the radiation is along the classical dermatomes in the extremities, having a centrifugal direction toward the hands and feet. In most instances the patient is unaware of any relationship between the vibratory sensations and flexion of the head until it is demonstrated to him. The following case reports are examples of the group illustrating the syndrome:

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§ This sign was described during the last war by Marie and Chatelin in 1917 and Babinski in 1918. And yet, strangely enough it acquired the eponym of “Lhermitte’s sign.”‖ Lhermitte, of course, wrote several articles on this “shocking” sensory disturbance which he found in cases of multiple sclerosis.‖‖‖‖ This subject was reviewed by Salmon in 1937.10
ELECTRIC-SHOCK SENSATIONS IN HEAD INJURY

Case 1. P.E.D., a 19-year-old Marine Private, was shot through the left frontal region. The missile entered at a point above the left eyebrow and, according to x-ray findings, lodged on the right side of the brain. Except for a momentary period of unconsciousness the patient was asymptomatic. The small scar above the left eyebrow healed rapidly and the patient was returned to duty. However, 7 weeks following the injury he began to complain of headaches, rhinorrhea, and "tingling" electric-like sensations in the hands and back. The sensations, which the patient found occurred only on flexion of the neck, radiated along the mesial aspects of the arms and forearms down to the palmar aspect of the finger tips. Repeated neurological examinations were always normal. Because of increasing severity of the headaches the patient was readmitted to an overseas hospital and a decompression was performed. The electric-shock sensations lasted 2 weeks and did not recur. Subsequently he was returned from overseas and has been symptom free for many months.

Comment. This patient sustained a head injury in the frontal region and yet several weeks after the trauma he had bilateral symmetrical symptoms characteristic of spinal cord disease. The fact that the complaints appeared during the post-traumatic period and lasted 2 weeks suggests that a pathological or some dynamic change had taken place long after the injury, possibly a regenerative process. The late appearance and transient nature of these symptoms were most characteristic features of the syndrome.

Case 2. R.O., a 24-year-old Marine Pfc., was struck on the right side of his head by shrapnel. The parietal bone was fractured and a small amount of brain tissue protruded through the wound. There was paralysis with concomitant pyramidal tract signs and sensory defects on the left side. These symptoms and signs remained for more than 2 weeks. X-ray revealed a bone defect and small fragment fracture line through the right parietal bone. Four weeks following the injury the patient noticed a sense of vibration and tingling in the back which radiated forward to the chest and abdomen. The following week he noticed that these shocks extended into the anterior and medial portion of the thighs and radiated to the tips of all the toes. Three months after the injury he felt an uncomfortable wave of "electric shock" which radiated down to the fingertips along the medial aspect of the upper extremities. He also found that on occasions he could not walk well, apparently because of an inability to balance himself. It seemed to him as if his feet were "light" and unsteady. Examination revealed minimal residual signs of a right parietal lobe lesion. These, however, were overshadowed by the symptoms elicited on acute flexion of the head. On this maneuver the patient experienced disagreeable sensations of electric shock running down the medial aspect of his upper extremities into the fingertips on the palmar side and from the thighs into the legs. In this acutely flexed posture the kinesthetic sense was found to be defective and he could not recognize the vibrations of a tuning fork. These symptoms and signs lasted 4 months, gradually disappearing from the lower extremities first. X-ray studies of the spine, examinations of the spinal fluid and manometric tests were all negative. The patient compared the sensation he experienced on flexion of the head to that of a vibrating tuning fork applied to a bony prominence.

Comment. In this case the syndrome was produced by an injury in the right parietal area. Again, the symptoms were transient and appeared some time after the trauma. Significant was the absence of history of symptoms of spinal cord trauma immediately after the skull injury. The fact that sensations were first localized to the trunk, later involved the lower and finally radiated along the upper extremities as well, indicated a spreading or dynamic change within the cord.