A SYNDROME IN ACUTE CERVICAL SPINE INJURIES FOR WHICH EARLY OPERATION IS INDICATED

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In acute cervical spine injuries an immediate complete paralysis with hypesthesia at the level of the lesion and an associated sparing of touch and some vibration sense is a syndrome for which early operative intervention is indicated. Two cases are presented here in which a diagnosis of acute extruded nucleus pulposus was made preoperatively on the basis of the syndrome, and the lesion was confirmed at operation. It is hoped that a discussion of these cases may lead to an earlier recognition of these lesions with the prevention or diminution of residual neurological disability.

The production of this syndrome may be explained on a precise anatomical basis. In May, 1947 Kahn\(^5\) presented a paper which first described the role of the dentate ligaments in chronic anterior spinal cord compression by a posteriorly protruded cervical nucleus pulposus. In these cases the symptoms of spasticity, hyperreflexia, disturbance of gait, and modified sensory changes simulate a degenerative lesion of the cord, such as lateral sclerosis. Previously it was believed that these symptoms were on the basis of compression of the anterior spinal artery. However, Kahn has indicated that the spinal cord may be firmly fixed by the fragile-appearing, but remarkably strong dentate ligaments so that posterior displacement of a herniated disk causes paralysis by anterior cord compression with exertion of stress upon the cord just above the attachment of the dentate ligaments. The publishers have very kindly permitted me to reprint Fig. 1 from the original article which shows these lines of stress (Fig. 1). I would like to quote from this article: “In anterior spinal cord compression I believe that, with pressure over a period of time, the pyramidal tracts, because of the greater stress on them and the large size of their fibers, have more disturbance of conductivity than the pain fibers of the spinothalamic tracts, even though the latter are closer to the compressing mass, be it midline herniated nucleus pulposus or tumor. Touch is preserved because, even though the touch fibers of the ventral spinothalamic tracts may fail to conduct, there is still sufficient sensation carried in the more protected posterior columns to prevent the clinical detection of touch disturbance. Postural sense is preserved because the attachment of the dentate ligaments prevents the posterior columns, which are farthest from the compressing mass, from being pressed against the unyielding laminae.”

Bucy, Heimburger, and Oberhill\(^2\) in their article on compression of the
cervical cord by herniated disks are inclined to accept Kahn's mechanical stress concept as the cause of symptoms rather than the theory of possible compression of the anterior spinal artery.

In both of these articles the authors have presented cases in detail that demonstrate the insidious pathogenesis of this type of lesion which simulates chronic degeneration of the cord. It should be emphasized that in these chronic cases there is a gradual development of symptoms, but in the acute cervical spine injury there is an immediate appearance of the syndrome. Nevertheless, the author is inclined to believe that the same mechanical stress factor is of fundamental importance in both the chronic and the acute types and feels that the following 2 cases illustrate that point.

**Case 1.** J.S., 36 years, white male, was involved in an auto accident on Aug. 21, 1948, and was thrown from his truck and pinned to the ground under it. He recalls lying beneath the truck, numb from the neck downward, and was unable to move either lower extremity. He was given first aid treatment at the local hospital and on the following day was transferred to St. Luke's Hospital, Cleveland, Ohio.

**Examination.** The patient had point tenderness over the lower cervical spine, weakness in his grip, paralysis of both lower extremities, and a level of hypesthesia at the C7 dermatome. However, there was no apparent loss of touch. There was abdominal distention, with urinary retention, priapism, and complete areflexia.

![Diagram of Stress Analysis](Image)