TRANSVERTEBRAL RUPTURE OF INTERVERTEBRAL DISC*

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(Received for publication March 15, 1962)

It is of historical interest to trace the development of information about rupture of intervertebral discs that was taking place concurrently on each side of the Atlantic Ocean in the first third of the twentieth century. Goldthwait, in this country, in 1911, presented a clinical report of displaced lumbar intervertebral cartilage producing sciatica and weakness of the leg. During the same year in Scotland, Middleton and Teacher reported neurological disorder caused by rupture of intervertebral disc. Elsberg in 1916, Stookey in 1928 and Bucy in 1930 reported cases of "chondroma" arising within the spine, producing neurological problems. Bucy's paper described a very satisfactory result following surgical removal (1929), by Dr. Percival Bailey, of the cartilaginous lesion "attached to the disk lying between the third and fourth lumbar vertebra." Dandy in 1929 described 2 cases in which he had removed loose cartilaginous fragments, considered by him to be "undoubtedly traumatic" in etiology. Schmorl and Junghanns in Germany (1932) graphically demonstrated pathological changes in structure of the disc although they were interested primarily in the prolapse of nucleus pulposus into the adjacent vertebral body. They recognized small posterior protrusions of the disc but felt that these rarely caused neurological symptoms. The stage was set for enlightenment and the first comprehensive clinical surveys of the problem of herniated disc were published at about the same time by Mauric in 1933 in Paris, and by Mixter and Barr in 1934 in Boston. Since then, thousands of papers have been published concerning the diagnosis and treatment of herniated intervertebral disc as well as the associated anatomical, pathological and biochemical aspects.

The purpose of this paper is to present an unusual form of rupture of discal material, wherein cartilage prolapses into the vertebral body and then breaks through the posterior wall of the vertebral body producing an intraspinal neurological problem (Fig. 1). This process obviously would be associated with defective bony structure even conceivably with infiltrative neoplasm, but here reported in the presence of osteoporosis in elderly people. We refer to the disorder as transvertebral rupture of intervertebral disc and, to the best of our knowledge, this has not been described hitherto.

The author has had clinical experiences with 3 cases of this unusual form of discal disorder which are described as follows:

Case 1. W.B.H., a 70-year-old man, was admitted to Strong Memorial Hospital on Aug. 29, 1959. He complained of right sciatic pain which had begun 1 week previously when he turned over in bed. Two weeks of orthopedic therapy in the hospital gave no relief of his constant severe pain.

Neurological examination revealed positive Lasègue's sign at 45° on the right side, diminished right knee jerk, partial atrophy and weakness of the quadriceps muscle, and no definite sensory loss. Roentgenograms of the lumbosacral spine indicated moderate osteoporosis and narrowing of the L3–L4 intervertebral space. Pantopaque myelography revealed a flat filling defect of the right lateral and central aspect of the subarachnoid space just above the L4–L5 interspace. Oblique views of the myelogram confirmed extension of the defect along the L4 body. The possibility of a metastatic tumor was considered but survey studies were negative for neoplasm.

* Presented at the annual meeting of the Neurosurgical Society of America, Biloxi, Mississippi, March 23, 1962.
† Aided by the Ernest L. Woodward Fund.
Fig. 1. Artist's drawing of transvertebral rupture of disc, showing (left) anteroposterior and (right) lateral views of L3-L4 intervertebral disc that has prolapsed into the L4 body and ruptured through the posterior wall of the vertebral body, producing compression of dura mater and the L4 spinal-nerve root.

Operation. At laminectomy the L3-L4 and L4-L5 discs were intact but intervertebral discal material was found presenting through a defect in the posterior wall of the L4 vertebral body on the right side. Forceps could be passed through the bony defect in an upward direction, communicating with the central portion of the discal space between L3 and L4. There was copious bleeding from the space within bone, controlled with Gel-foam.

Postoperatively, the patient followed an excellent course of recovery, with relief of pain as well as neurological improvement.

Case 2. J.A.B., a 74-year-old woman, was admitted to Strong Memorial Hospital on March 1, 1960. She had a 5-month history of left sciatic pain and weakness of the left leg, beginning without known significant injury. We were able to discern that the first flash of sciatic pain appeared while she was walking in her back yard in October 1959. There was a history of mild diabetes.

Examination showed positive straight-leg-raising test on the left side and there was marked neurological deficit in the left leg, consisting of atrophy and weakness of thigh and calf, almost complete foot drop, decreased left knee jerk, absent ankle jerk bilaterally and sensory defect over the lateral aspect of the left calf. Roentgenograms of the lumbosacral spine were interpreted as showing marked osteoporosis and partial narrowing of the L4-L5 interspace. Pantopaque myelography outlined a large left-sided filling defect in the region of L4-L5 discal space, extending up over the L4 vertebral body. The clinical picture and contrast studies were considered compatible with an intraspinous neoplasm. Survey studies were negative for metastatic neoplasm.

Operation. At laminectomy a granulomatous epidural mass was found arising cephalad to the L4-L5 disc on the left side. There was no defect at the intervertebral space. During the surgical extirpation, a sizable defect in vertebral bone was exposed and tissue was withdrawn from the central portion of the vertebral body. There was generous bleeding from the soft regional bone. This was considered, at the time of operation, to be a metastatic neoplasm. It was not until pathological examination of the tissue was made that it was identified as intervertebral disc and we realized that the organization and vascular reaction involving the discal material over a period of 5 months had produced the gross picture of neoplasm.

The patient followed a course of satisfactory recovery in terms of relief of disabling pain and satisfactory ambulation, using a spring brace for partial residual foot drop.