


RUPTURE OF THE INTERVERTEBRAL DISC WITH INVOLVEMENT OF THE SPINAL CANAL*

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During the last few years there has been a good deal written and a large amount of clinical work done stimulated by Schmorl's investigation of the condition of the intervertebral disc as found at autopsy. His work

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will stand as the most complete, painstaking and authoritative that has ever been done in this condition. This work, however, is purely pathological and it now remains for the clinician to correlate it with the clinical findings and apply it for the relief of those patients who are disabled by the lesion.

In the routine examination of spines from autopsy material he discovered that the intervertebral disc is often involved in pathological changes, the most common one being prolapse of the nucleus pulposus into an adjacent vertebral body. He found one or more such prolapses (Knorpelknochen) in about thirty-eight per cent of the spines examined. He also discovered that in about fifteen per cent of the spines there were small posterior prolapses beneath the posterior longitudinal ligament, but concluded that they rarely, if ever, produced clinical symptoms. He attributed their presence to weakening of the annulus fibrosus by degenerative changes, with mild trauma as a second factor, producing fissures in the annulus and escape of the semifluid nuclear material.

On the other hand, for a number of years clinicians have been reporting cases of spinal cord pressure from intervertebral disc lesions. In 1911 Goldthwait reported a case of sciatica and paraplegia which he attributed to a posterior displacement of the intervertebral disc at the lumbosacral junction and suggested that such displacements might be the cause of many cases of lumber, sciatica, etc. Middleton and Teacher report a similar case confirmed at autopsy. Elsberg in 1916 mentions chondroma of the vertebrae as causing compression of the cauda equina and states that Oppenheim has described a similar case. Mixter in 1921 mentions a similar case and numerous other reports by Elsberg, Stookey, Bucy, Petit-Dutaillis and Alajouanine, and others have come into the literature. Thus the enchondroma, chondroma or echondroma arising from the intervertebral disc has become, to the neurosurgeon at least, a well-recognized lesion to be treated by excision and with a distinctly favorable prognosis. Dandy in 1929 reported two cases from which he had removed loose cartilaginous fragments protruding extradurally into the spinal canal. He considered them "undoubtedly traumatic" in origin.

Our interest in this group of cases was stimulated particularly by a case seen by us two years ago in which the main symptoms were referable to root pain and in which the tumor was situated in the intervertebral foramen without cord or cauda equina compression of any moment.

Investigation of the cases of spinal cord tumor treated at the Massachusetts General Hospital and in our own private practice has shown a surprisingly large number of these lesions, classified as chondromata, to be in truth not tumors of cartilage, but prolapses of the nucleus pulposus or fracture of the annulus. We have attempted to review these cases and differentiate true neoplasm and masses caused by rupture of the disc. We find as a result of this review that nineteen of our cases are rupture of the disc and six are true cartilaginous tumor or unclassified.

Clinically these cases of disc rupture, particularly the more recent ones, are of considerable interest. Diagnosis has been made difficult and operation has been delayed in them on account of the indefinite nature of the symptoms and signs and their similarity to those found in various conditions such as back strain, arthritis, sacroiliac disease, etc.

A summary of all cases of ruptured intervertebral disc is shown in table 1. For the purposes of this article abstracts of two cases will suffice.

Case 4: On February 6, 1933 a white married chauffeur, aged 28, was admitted to the Massachusetts General Hospital. He gave a history of gradually increasing stiffness of his legs, noticed chiefly in walking, and of increasing numbness of the fourth and fifth fingers of each hand. The onset was insidious about six months before admission. He had been treated for cerebrospinal syphilis for three months.

P. H.: Essentially negative. There was no history of serious trauma.

P. E.: Showed definite hyposthesia over the ulnar distribution of each hand and very mild sensory disturbance of the trunk extending downward from the level of the nipples. There was definite spasticity of the legs with hyperactive knee and ankle jerks, bilateral ankle and patellar clonus, bilateral positive Babinski sign. Biceps and triceps reflexes were also increased.

Combined cistern and lumbar puncture was done. There was alteration in the dynamics in the lower needle indicative of a partial block. The total protein of the fluid from the cistern was 17, and of the lumber fluid 54. If 40 milligrams be considered the upper limit of normal, then the lumbar fluid shows definite elevation in total protein. By injection of 2 cubic centimeters of iodized oil into the cisternal needle the block was localized at the level of the intervertebral disc between the fifth and sixth cervical vertebrae. Note that in the lateral view (fig. 4) the block is shown, and that the intervertebral disc is narrowed and there are hypertrophic changes present. After some delay the oil passed the point of obstruction and descended into the lower end of the dural sac. The patient was then placed on a fluoroscopic tilt table, head down. Another x-ray showed that the return of the iodized oil to the cistern was blocked at exactly the same point as on its descent.

Cervical laminectomy disclosed a spinal cord compression by an extradural encapsulated fibrocartilaginous mass 1.5X0.8X0.3 centimeters in size. The tumor lay in the midline in front of the cord and was exposed by rotating the cord and incising the anterior dura. It was easily removed from the underlying intervertebral disc.