THE THORACIC HERNIATED INTERVERTEBRAL DISC SYNDROME

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Since large series of herniated thoracic discs have not been reported, the present group is being tabulated in some detail. For the reason that 2 of the cases present unusual findings that, to our knowledge, have not been reported elsewhere, we have felt this group would be of interest.

In the Albany Hospital in the last 15 years, 10 herniated intervertebral discs in the thoracic region have been confirmed at operation. These appeared in a series of 2,026 cases in which the diagnosis of herniated disc was made. In 1,145 cases this was confirmed at operation. The others were cases in which the patients received conservative treatment and which were therefore unverified. This is about five times the incidence (12 in 5,500 cases) reported by Love and Kiefer in 1950.7 Of this series of herniated thoracic intervertebral discs, the location and chief presenting signs are recorded in Table 1. Roentgenological findings and cerebrospinal fluid changes are listed in Table 2.

The two cases described below make it clear that, while progressive pyramidal tract signs usually appear, preceded by radicular pain at the level of the herniation, this is not necessarily the case. A variety of misleading neurologic signs are to be anticipated. A single, well-defined syndrome, such as one sees with the herniation of a cervical disc or a lumbar disc, is not the rule. In only 3 of the 10 cases tabulated was a diagnosis of herniated thoracic intervertebral disc seriously entertained from the clinical examination, roentgenologic findings and cerebrospinal fluid protein level. Even radicular pain at the level of the lesion is not frequent. When present it is not characteristically intermittent as is the pain associated with other discs, and it may even disappear after a time. This peculiarity of the pain, coupled with slowly progressive signs of cord involvement, often leads to a diagnosis of cord tumor.

In 1 case the plain roentgenograms revealed narrowing at the interspace where the herniated disc was ultimately demonstrated. In 4 cases myelography showed a complete block at or within 1 cm. of the interspace involved, and in 6 cases a partial block was found laterally placed and usually centered over the interspace at which the herniation had occurred. The range of the cerebrospinal fluid protein was 31 mg. per cent to 194 mg. per cent, with an average level of 92.4 per cent.

* Deceased February 15, 1956.
The following case histories are presented as unusual variations of herniated intervertebral disc syndromes in the thoracic region.

**CASE REPORTS**

Case 9. M.G. (A97994), a 20-year-old white single female, was admitted to the Albany Hospital by way of the emergency room on July 4, 1951 with the chief complaint of pain in the back and legs. Two years earlier she had had pain in the left leg and was uncomfortable when sitting, without history of back injury. This had lasted about a year and then cleared up.

The day before admission the patient was lifting cases of eggs and butter weigh-
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**TABLE 2**

Roentgenologic findings and cerebrospinal fluid changes in cases of herniated thoracic intervertebral discs

<table>
<thead>
<tr>
<th>Case and Hospital No.</th>
<th>CSF Protein mg.%</th>
<th>Plain X-rays</th>
<th>Myelogram</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. J.P. A42332</td>
<td>78</td>
<td>None taken</td>
<td>Partial block at level of interspace</td>
</tr>
<tr>
<td>2. R.B. A56112</td>
<td>80</td>
<td>Diffuse bridging and spurting dorsal spine</td>
<td>Partial block at level of interspace</td>
</tr>
<tr>
<td>3. S.L. A4725</td>
<td>31</td>
<td>Cervical taken only</td>
<td>Complete block at level of interspace</td>
</tr>
<tr>
<td>4. L.S. A83775</td>
<td>99</td>
<td>Negative</td>
<td>Complete block at level of interspace</td>
</tr>
<tr>
<td>5. H.M. A35537</td>
<td>70</td>
<td>None taken</td>
<td>Partial block at level of interspace</td>
</tr>
<tr>
<td>6. H.S. B82977</td>
<td>118</td>
<td>Diffuse spurting dorsal spine</td>
<td>Partial block not centered at level of interspace</td>
</tr>
<tr>
<td>7. J.B. A59836</td>
<td>52</td>
<td>Cervical taken only</td>
<td>Partial block at level of interspace</td>
</tr>
<tr>
<td>8. K.H. 94667</td>
<td>107</td>
<td>Narrowing D10–11 (disc found at D11–12)</td>
<td>Complete block at level of interspace</td>
</tr>
<tr>
<td>9. M.G. A97994</td>
<td>194</td>
<td>Narrowing at level of disc (D11–12)</td>
<td>Complete block at interspace</td>
</tr>
<tr>
<td>10. C.P. B87439</td>
<td>95</td>
<td>Diffuse hypertrophic changes dorsal spine</td>
<td>Partial block at interspace</td>
</tr>
</tbody>
</table>

...
block at the level of the body of T12. Queckenstedt test produced a slow rise to 350 mm. of cerebrospinal fluid with no fall. Cerebrospinal fluid protein was 194 mg. per cent.

Operation. Immediately after myelography, laminectomy was performed at T10, 11, 12, and L1. The cord was found to be humped backwards. An incision in the posterior column on the right, where the posterior displacement was greatest, revealed a small hematomia in the cord, which was less than 1 cc. in volume. A small biopsy from the wall of this hematoma was reported to show some proliferation of ependymal cells which might represent part of an ependymoma. The cord, however, did not return to its normal contour. After exploration anterior to the cord intradurally had been inconclusive, extradural search revealed a soft midline protruded disc at the T11–12 level. This was removed and the wound was closed with interrupted black silk sutures.

Pathologic Report. The fragments from the disc were reported to show focally degenerated fibrocartilage.

Course. The patient had an uneventful recovery and was discharged from the hospital with bilateral foot drop and considerable weakness of the legs. Postoperative cistometrogram revealed a normally functioning bladder.

She has been followed now for some 4 years and still has a moderate bilateral foot drop and hyperactive deep tendon reflexes. However, she is able to walk fairly well without crutches and has been able to work. There has been no progression of her signs since the operation.

Comment. It seems highly unlikely that the pathological findings in the wall of the small hematemyelic cavity represented an ependymal neoplasm. On careful re-examination of these slides, one small area was found in which it was thought an ependymoma could be clearly demonstrated. If this proves to be true, it appears probable that the disc herniation produced a hematoma in a very small ependymoma by direct trauma.

Case 6. Mrs. H.S. (B82077), referred by Dr. Snyder of Corinth, New York, was seen first in an office examination on Dec. 20, 1954, at which time she complained chiefly of in ability to use her legs properly. About 1 year earlier, severe backache began to develop in the lower thoracic region, which occasionally radiated into the lower abdomen, of variable intensity, but usually worse about 3 or 4 o’clock in the morning. As time went on, her pain did not change a great deal until 6 months prior to examination, when tingling began to develop in her feet and the pain ceased. Within 2 or 3 months this tingling was replaced by gradually increasing numbness, from the lower abdominal region downward. By this time her feet had become numb so that she was unable to walk with her eyes closed. She had not noticed any weakness in the legs, any disturbance of bladder or bowel, nor any loss of weight.

Examination at that time revealed a positive Romberg with complete loss of position sense in the lower extremities. Knee and ankle jerks were very lively, with variable, unsustained patellar clonus and normal plantar reflexes. There was slight hypalgesia bilaterally in the T11 dermatome. Relaxation of the lower abdominal musculature was evident, producing a pronounced “pot-belly,” to a greater degree than in the average female of her age.

She was admitted to the hospital on Jan. 2, 1955, the delay occasioned by personal reasons.

Examination. On admission there was hypalgesia from the T11 level downward,
together with positive Babinski signs, sustained ankle clonus, hyperactive knee and ankle jerks, but no weakness in the lower limbs and no difficulty with bladder or rectum. The lower abdominal reflexes were depressed. The most severe impairment noted in her neurologic examination was complete loss of position sense in her legs. Straight leg raising could be carried to 30° on the right and 90° on the left.

Myelography revealed a partial block at the level of T11. Cerebrospinal fluid protein was 118 mg. per cent. A preoperative cystometrogram disclosed a mildly hypotonic bladder.

Operation. Intradural extra-arachnoid exploration demonstrated a long, low, flat mass anteriorly, lying extradurally. The dura mater was closed and the mass was removed. It was a large, partially calcified herniated intervertebral disc at the T11–12 interspace.

Course. The patient had a somewhat more hypotonic bladder postoperatively, as demonstrated by a cystometrogram done immediately after operation, but within 1 week this had returned almost to normal and she was voiding without residual.

DISCUSSION

The incidence of thoracic disc protrusion varies widely. Mixter and Barr⁹ reported 1 thoracic protrusion among 19 cases of herniated disc. The report of Hawk⁵ indicates a rather high incidence of thoracic protrusion. Love and Walsh⁴ reported 113 discs, of which 6 were thoracic. In 1950 Haley and Perry⁶ reported complete autopsy on 99 spinal columns, and in 7 of this group there were multiple thoracic protrusions. These were autopsies picked at random, and the patients did not necessarily present symptoms during life. Svien and Karavitis¹⁰ reported surgical treatment of a patient with such multiple protrusions in the upper thoracic region. In 1950 Love and Kiefer⁷ reported an incidence of 12 in 5,500. They stated that no syndrome of intervertebral disc herniation in the thoracic region was found to be typical, as it was in the cervical and lumbar regions, and that of the total group of 17 herniated thoracic intervertebral discs collected from their own series and from the literature, in only 3 was the diagnosis made before operation. In 1952 Logue⁶ reported 11 herniated thoracic discs in a series of 250. A group of 800 intervertebral discs operated on in the Montreal Neurological Institute revealed an incidence of 10 in the thoracic spine.² Epstein³ made no attempt to determine frequency of thoracic disc disease because of so much variation in the available reports. Abbott and Retter¹ in 1956 reported that in a series of over 600 discs of all types, there were 11 protrusions in the thoracic region among 9 patients, and felt that the actual frequency was much higher than the incidence reported by Love and Kiefer. They also collected a total of 64 reported herniated thoracic discs in a careful review of the literature through 1955. This included their own series of 13.

As far as sex incidence is concerned, it was about equally divided in the Love and Kiefer⁷ series, 9 females and 8 males. Abbott and Retter¹ were of the same opinion. In our own series there were 5 males and 5 females. However, these samples are so small that conclusions are not warranted, but it does appear that the distribution tends to be roughly equal in males and
females. Age distribution ranges from the young to the very old with the exception of the first decade.

Abbott and Retter found 6 purely lateral protrusions in their group of 13 protrusions in 11 cases and stated that a fairly uniform syndrome was to be found in these patients as opposed to those with centrolateral protrusions. In our series, 6 of 10 protrusions were laterally placed and 4 were midline, but no such clear difference in the clinical picture was found between lateral and central discs. This may be ascribable to difference of definition, in that the 6 laterally placed discs might be considered centrolateral protrusions by other observers. It is worthy of note that 3 of our 10 patients had suffered from severe bronchial asthma for many years.

The first of the 2 unusual cases reported here presents an acute herniation of a thoracic disc with hematomyelia. After evacuation of the intramedullary hematoma and removal of the disc, the patient made a relatively good recovery. The interesting point in Case 2 is that the greatest neurologic defect was found in the posterior columns, with mild pyramidal tract involvement. From these findings it was anticipated that her lesion was causing pressure on the dorsum of the cord, which was the reverse of the actual situation.

To say the least, thoracic herniated discs present protean manifestations which can lead to incorrect diagnoses. Compression of the spinal cord appears to be much more frequent with herniation in the thoracic than in the cervical spine, so that early diagnosis and early removal of this compression is more imperative with a thoracic disc than with one in any other location. The urgency of early removal is made even greater by the fact that, whereas benign cord tumors produce slowly increasing compression with relatively good recovery following removal, the thoracic disc is subject to sudden additional herniation or extrusion subsequent to the onset of the disease. The sudden alterations in cord compression accompanying such protrusions result in the same lasting neurologic deficit commonly encountered in cases of spinal fracture and other rapidly developing compression of the cord.

Two depressing examples of such irreversible neurologic change have been observed by us. One of the patients in our Albany Hospital series remained paraplegic without any vestige of recovery for 3 months after operation, finally dying of intercurrent infection. The second patient was one observed on the Psychiatric and Urologic Services at various times. His T11–12 herniated disc had been removed elsewhere. Unimproved paraparesis was accompanied by excruciating pain in the lower limb. In spite of heroic efforts on the part of the patient to carry on a large general medical practice, he found himself increasingly disabled, first by the pain and then by the added burden of narcotic addiction. A unilateral prefrontal lobotomy was later performed at another hospital with little effect upon the pain and was followed by the subsequent development of postoperative epilepsy. Within 5 years after removal of the disc, this physician underwent complete dissolution of his personality and died.
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SUMMARY

1. A series of 10 herniated thoracic intervertebral discs among 1,145 herniated discs confirmed at operation is reported.
2. Two cases which presented unusual findings are described in detail.
3. The previously recorded series are reviewed.
4. The conclusion is drawn that the only hope for such patients lies in early surgical intervention.

REFERENCES

2. Cone, W. V. Personal communication.