SPINAL TUMORS DIAGNOSED DURING THE FIRST YEAR OF LIFE

WITH REPORT OF A CASE*

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In reviewing over 70,000 case histories from the Harriett Lane Home, Ford was able to find only 3 cases of spinal cord tumor, the youngest of these 3 patients being 9 years of age. The literature bears out the rarity of intraspinal tumors in children. Even more striking is the infrequency with which spinal tumors are diagnosed during the first year of life. In a review of 279 cases of spinal cord tumor collected by Antoni and in a more recent review of 451 cases collected by Adson no patient was found under 1 year of age. The author was able to find only 23 recorded instances in which an intraspinal tumor had been diagnosed during the first year of life. The purpose of this paper is to briefly review these 23 cases and to report an additional example of this unusual occurrence.

CASE REPORT

P. R., male, aged 5 months, was admitted to the University Hospital on April 11, 1949. He had been born at term and weighed 8 lbs. at birth. The mother’s pregnancy, labor, delivery, and postnatal course had been uneventful, and the patient was her 13th child. He had had several upper respiratory infections, the most recent being 2 weeks prior to admission. He cried with each bowel movement as though he were straining to defecate. The stools were hard and dry. During the last 2 weeks there was constant dribbling of urine with no urinary stream. Two weeks prior to admission the mother accidentally struck the patient’s back. Within 24 hours weakness in the lower extremities was noted. This weakness progressed until at time of admission he was completely paralyzed in his lower extremities except for slight motion in the toes.

Examination. B. P. 96/62; pulse 110; respirations 24; rectal temperature 98.0°; weight 15 lbs. 14 oz. Pain and temperature perception were diminished below the level of the 1st lumbar dermatome. There was flaccid paralysis of both lower extremities with some motion retained in the toes. The deep tendon reflexes, normal in the upper extremities, were hypoactive in the lower extremities, with sustained ankle clonus on the left and unsustained ankle clonus on the right. Hb. 85 per cent. WBC 0600: 29 per cent polymorphonuclears; 68 per cent lymphocytes (24 per cent atypical); 2 per cent eosinophiles; 1 per cent monocytes. Reticulocytes 0.4 per cent; platelets 37,800. Urea nitrogen, blood sugar, heterophile antibody, and serological tests for syphilis were within normal limits.

Roentgenograms of the chest and abdomen showed no abnormality. Intravenous pyelography was negative. Roentgenograms of the spine showed minimal dilatation of the spinal canal at the level of the 12th thoracic and 1st lumbar vertebrae (Fig. 1).

Lumbar puncture disclosed a complete subarachnoid block with yellow fluid containing 1 lymphocyte and 4 + globulin. The fluid clotted on standing. Due to the unreliability of the sensory level a pantopaque myelogram was done and revealed a complete block, the lower end of which was between the 1st and 2nd lumbar vertebrae. Following myelography the patient became completely paraplegic.

Operation. April 19, 1949. Anesthetic: intratracheal ether and oxygen. The spines and laminae of the 12th thoracic and 1st lumbar vertebrae were removed, disclosing an extradural, reddish-brown, granulomatus tumor. The inferior edge of the growth lay within the operative field but it was necessary to remove the spine and laminae of the 11th thoracic vertebra in

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order to expose the superior extent of the lesion. It was found that the tumor was of low vascularity, friable, and encircled the dural sac, but lay predominantly dorsally and on the left side. The tumor was removed piecemeal with curette. The muscles, fascia and skin were closed with silk.

Subsequent Course. The patient made an excellent recovery; 36 hours after operation he was again able to move his toes, and by the 10th postoperative day there was return of motor power to all muscle groups of both lower extremities with return of pain and thermal percep-

Fig. 1. Preoperative roentgenogram of spine. The area in which dilatation of the spinal canal was noted is shown in the enlargement on the right.

tion. The pathologist, following microscopic examination of the tissue, felt that the lesion represented a myelocytoma (lymphocytoma). In light of this finding bone marrow studies were done. The hematologist felt that the bone marrow studies were compatible with lymphatic leukemia. At time of last examination on June 18, 1949, 65 days after operation, the patient showed no signs of neurologic disorder.

COMMENT

The 23 previously recorded instances in which an intraspinal tumor has been diagnosed during the first year of life are summarized in Table 1. The predominant
TABLE 1

Spinal tumors diagnosed during first year of life

<table>
<thead>
<tr>
<th>Type</th>
<th>Author</th>
<th>Year</th>
<th>Age</th>
<th>Location</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lipoma</td>
<td>Johnson19</td>
<td>1856</td>
<td>10 mos.</td>
<td>Sacral</td>
<td>Excision of tumor through pre-existing aperture in sacrum. Complete recovery.</td>
</tr>
<tr>
<td>Lipoma</td>
<td>Témoin18</td>
<td>1892</td>
<td>9 mos.</td>
<td>Sacral</td>
<td>Tumor almost exclusively superficial. No neurologic signs.</td>
</tr>
<tr>
<td>Lipoma</td>
<td>Témoin18</td>
<td>1892</td>
<td>8 mos.</td>
<td>Lumbar</td>
<td>Removal of tumor connected to spinal canal by two pedicles. Recovery.</td>
</tr>
<tr>
<td></td>
<td>Valentini1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dermoid</td>
<td>Virchow27</td>
<td>1857</td>
<td>Stillborn</td>
<td>Lumbarosacral</td>
<td>Stillborn hydrocephalic.</td>
</tr>
<tr>
<td>Dermoid</td>
<td>Muscatello22</td>
<td>1894</td>
<td>5 mos.</td>
<td>D4 &amp; L4−5</td>
<td>Diagnosed at autopsy.</td>
</tr>
<tr>
<td>Dermoid</td>
<td>Ivanoff15</td>
<td>1903</td>
<td>Stillborn</td>
<td>Entire cord and medulla</td>
<td>Stillborn anecephalic monster.</td>
</tr>
<tr>
<td>Dermoid</td>
<td>Hansmann13</td>
<td>1926</td>
<td>1 day</td>
<td>Conus</td>
<td>Died of bronchopneumonia on day after repair of harelip &amp; cleft palate. Diagnosed at autopsy.</td>
</tr>
<tr>
<td>Teratoid</td>
<td>Black &amp; German6</td>
<td>1930</td>
<td>10 mos.</td>
<td>D12 to L4</td>
<td>“Pilonidal dimple” in sacral region &amp; telangiectasis over L2−3 vertebrae with overgrowth of hair. Laminectomy. Improvement.</td>
</tr>
<tr>
<td>†Teratoma</td>
<td>Ingraham &amp; Bailey27</td>
<td>1946</td>
<td>1 yr.</td>
<td>Lumbar</td>
<td>Associated occult spinis bifida. Laminectomy &amp; incomplete removal of tumor. No recurrence 51 yrs. postop.</td>
</tr>
<tr>
<td>Teratoma</td>
<td>Black &amp; German6</td>
<td>1930</td>
<td>5 mos.</td>
<td>Foramen magnum to S2</td>
<td>3 laminectomies in 5 weeks. Marked improvement neurologically but had chronic urinary tract infection. Died of renal failure 81 yrs. postop.</td>
</tr>
<tr>
<td>Sarcoma</td>
<td>Weill-Halle, Vogt, Dubem &amp; Dubost18</td>
<td>1902</td>
<td>1 yr.</td>
<td>D8−10</td>
<td>Lumbar puncture; albumino-cytologic dissociation. Cisternal puncture: 3 lymphocytes &amp; negative Pandy. Cisternal epididym: arrested at D10 vertebra. Presumed to be sarcoma since neurologic signs receded after x-ray therapy.</td>
</tr>
<tr>
<td>Neuroblastoma</td>
<td>Anitschkow4</td>
<td>1913</td>
<td>4 mos.</td>
<td>Lumbar</td>
<td>Hour-glass tumor. Laparotomy; death.</td>
</tr>
</tbody>
</table>

* Quoted from Sachs and Horrax.16
† Since it was necessary to use the nomenclature of Sachs and Horrax in quoting the cases reported by Bailey and Ingraham in 1947, the same nomenclature is employed here in connection with the cases reported by Ingraham and Bailey in 1946.
tumor in this group is the lipoma, which comprises 6 of the 23 cases. Four cases of
dermoid, 4 of teratoid, 3 of teratoma, 3 of sarcoma, and 1 each of neurofibroma,
neuroblastoma and intramedullary glioma make up the remainder of the series. To
these is added the case here reported, making a total of 24. Of these 24 cases,
one-half have been diagnosed before death, and in 11 the tumor has been attacked sur-
gically. It is of interest to note in this group the high incidence of associated anom-
aliess: hydrocephalus, hermaphroditism, spina bifida, anencephalus, harelip, cleft palate,
wriry neck, talipes varus, "pilonidal dimple" and telangiectasis with over-
growth of hair.

Myelography may be employed to aid in localization of the lesion but dilatation
of the spinal canal as shown on the plain roentgenograms is a valuable sign when
present.

The age of these patients should not contraindicate operation when the integrity
of the intraspinal structures is endangered. The excellent operative results obtained
by Ingraham and Bailey4,16,17 and the case reported by Black and German8 in which
3 operations were performed to remove a tumor which extended throughout almost
the entire spinal canal have demonstrated the feasibility of treating these children
surgically.

There are of course many unreported cases, some of which have undoubtedly
been successfully treated surgically. Sachs,23 in reviewing his series of 235 verified
spinal tumors, has found 3 cases which would fall into the group discussed in this
paper—an astrocytoma in a 1-year-old child, an extradural sarcoma in a child of 5
months, and an inamedullary astrocytoma in a 1-year-old child.

It does not lie within the scope of this communication to discuss the neurologic
manifestations of leukemia. The reader is referred to the papers by Critchley and
Greenfield,11 Schwab and Weiss,25 and Bass,6 which respectively deal with spinal
symptoms of leukemia, neurologic aspects of leukemia, and the neurologic mani-
festations of leukemia in children. None of these authors mentions a spinal tumor in a
patient under 1 year of age.

SUMMARY

The case is reported of a 5-month-old child who became paraplegic within a
period of 4 weeks and whose symptoms were relieved by laminectomy and partial
removal of an extradural thoracolumbar leukemic deposit. The patient was subse-
quently found to be suffering from lymphatic leukemia.

The literature concerning intraspinal tumors diagnosed during the first year of
life is briefly reviewed.

The author is indebted to Dr. John Wagner for the pathologic studies and to Dr. Milton
Sacks for the hematologic studies.

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4. Bailey, O. T., and Ingraham, P. D. Quoted by Sachs, E., Jr., and Horrax, G.24
18. Ivanoff, N. J. Quoted by Boldrey, E. B. and Elvidge, A. R. 3
23. Sachs, E. Personal communication.