Acute paraplegia as the initial symptom of acute leukemia

Case report

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A case in which acute paraplegia occurred as the initial symptom of acute leukemia in an 11-year-old girl is reported.

Key Words - acute leukemia - acute paraplegia - epidural and vertebral leukemic infiltration

The onset of acute leukemia may be abrupt with a great variety of clinical manifestations.2,10 As far as we know, a case with acute paraplegia as the initial symptom has not been described.

Case Report

An 11-year-old girl was admitted on June 7, 1972, because of a 10-day history of progressive pain and paralysis involving both legs. In January, 1972, an appendectomy had been performed; there had been no enlargement of the lymph nodes, and the appendix showed neither gross nor histological neoplastic abnormality. Postoperatively, the patient had a slight fever caused by bilateral pneumonia. Chest films showed small nodular infiltrations in both lung fields, but no lymph-node enlargements in the hilar regions. The suspicion of primary atypical pneumonia was confirmed by the increased cold agglutinin titer and the rapid regression of the infiltrates during tetracycline therapy. During that hospital stay the hemoglobin level was 13.0 gm%, leucocytes 10,400/mm³, with 28% lymphocytes, 34% atypical lymphocytes, and 37% neutrophils. Electrophoretic analysis showed the serum protein gamma G and A to be normal; gamma M was accentuated but without paraprotein. The patient was discharged feeling well in mid-February, 1972.

On the morning of May 27, 1972, the patient awoke with intense, nonradiating lumbar pain, which had not been preceded by trauma. There was no fever or sphincter disturbance. Within a few days, the persistent lumbar pain began to radiate to the abdomen and legs, accompanied by paresthesias of both feet; a shuffling gait developed. Treatment by manipulation resulted in apparent transient improvement, but on June 5, 1972, paralysis developed in both legs, accompanied by sphincter disturbances.

Examination. On admission, the girl was fully conscious and oriented, but in severe
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pain. Her temperature was 37.0°C. Slight neck stiffness was present. The abdomen was soft, without abnormal masses. The abdominal reflexes were normal, but sphincter tone was absent. Percussion of the thoraco-lumbar spine produced pronounced tenderness over the spinous process of the first lumbar vertebra. There was flaccidity of both legs and bilateral hypesthesia below the umbilicus. Positional and vibratory sense was lost in both legs, and the knee and ankle jerks were diminished. A Babinski response was present bilaterally; Kernig's sign was positive. The cranial nerves and optic discs were normal. Lumbar puncture released cerebrospinal fluid (CSF) under a pressure of 195 mm H₂O; there was no increase in Queckenstedt's test. The CSF was clear and contained a protein content of 547 mg% and 1 leukocyte/mm³. X-ray films of the thoraco-lumbar spine did not reveal bone destruction. Suboccipital Pantopaque myelography showed complete block at T-6. Chest films showed normal lung fields without signs of infiltrations.

Operation. As an acute spinal epidural abscess was suspected, laminectomy of T7-12 was performed. A layer of grayish, epidural tumor tissue, 1.5 cm in thickness, was exposed and removed.

Histological Examination. The epidural tissue and lamina from the seventh thoracic vertebra contained packed primitive tumor cells with round, oval, and kidney-shaped nuclei and scanty cytoplasm. The tumor had invaded the epidural fatty tissue diffusely. Staining with azuresin revealed eosinophilic granules in the tumor cells. The same tumor cell was demonstrated in the bone marrow of the lamina of the seventh thoracic vertebra. Histological diagnosis: epidural malignant tumor (leukemic manifestation). Azuresin, X 400.

Fig. 1. Photomicrograph of the epidural tissue and lamina from the seventh thoracic vertebra showing a very hypercellular tumor composed of closely-packed primitive tumor cells with round, oval, and kidney-shaped nuclei. The cytoplasm is relatively scanty. The tumor diffusely invades the epidural fatty tissue and is seen to infiltrate and destroy the latter. The same tumor cells could be demonstrated in the bone marrow of the lamina of the seventh thoracic vertebra. Histological diagnosis: epidural malignant tumor (leukemic manifestation). Azuresin, X 400.

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available today. Most commonly, the symptoms from the central nervous system in leukemia, such as vomiting, headache, papilledema, lethargy, and vertigo, are referable to increased intracranial pressure caused by infiltration of the cortex and meninges. Other frequent manifestations are facial paralysis, even as an initial symptom, and paresis of the ocular muscles. The same authors observed paraplegia in three of 109 separate leukemic episodes in 59 children, but we have been unable to find any report of acute myeloid leukemia of such a dramatically rapid onset as that seen in our patient.

In from 5% to 35% of all lymphomas, a transformation to a primary leukemia occurs, the so-called “conversion” of the lymphoma group. In our case, the histological appearance seems to exclude this possibility.

It is surprising that so massive a leukemic infiltration in the epidural space did not give rise to slowly progressive spinal deficits. The acute onset may have been due to a thrombosis or hemorrhage of the spinal cord in the tumor-bearing region. Also, the earlier chest and abdominal episodes may have been part of the myeloblastic leukemia that became obvious later.

Acknowledgments

The authors are indebted to Edith Reske-Nielsen, M.D., and K. Bjørn Jensen, M.D., for the neuropathological and hematological examinations, respectively.

Discussion

Metastatic involvement of the central nervous system during the course of leukemia is an increasingly frequent occurrence because of the longer survival time brought about by the efficacious cytotoxic therapy available today. Most commonly, the symptoms from the central nervous system in leukemia, such as vomiting, headache, papilledema, lethargy, and vertigo, are referable to increased intracranial pressure caused by infiltration of the cortex and meninges. Other frequent manifestations are facial paralysis, even as an initial symptom, and paresis of the ocular muscles. The same authors observed paraplegia in three of 109 separate leukemic episodes in 59 children, but we have been unable to find any report of acute myeloid leukemia of such a dramatically rapid onset as that seen in our patient.

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