Intraspinal Dermoid Tumor Presenting as Chemical Meningitis

Report of a Case Without Dermal Sinus

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This case is being presented to report an apparent chemical meningitis which delayed the establishment of an accurate diagnosis of intraspinal dermoid tumor.

Case Report

History. A 6-year-old girl entered the Mount Sinai Hospital in October, 1965, because of fever, headaches, and difficulty with urination. Two weeks prior to admission she fell from her bicycle, landing in a semi-sitting position. The next day she complained of headaches and abdominal pain. A few days later she developed fever, vomiting, photophobia, and neck stiffness, which persisted despite oral penicillin therapy. She was then hospitalized elsewhere where the past history revealed enuresis unchanged since infancy and increasing urgency and frequency of urination for the past 2 years. A lumbar puncture at that time revealed normal spinal fluid pressure and 1400 cells/mm³, 70% of which were polymorphonuclear leukocytes. A few gram negative diplococci were seen on smear, but culture showed no growth in 72 hours. Although the patient was treated with adequate doses of intravenous antibiotics, she continued to run a febrile course with temperatures varying from 102° to 104°F. She subsequently developed urinary retention which necessitated insertion of an indwelling urethral catheter. Because of persistent temperature elevation, a second lumbar puncture was performed. Grossly purulent fluid was obtained at the L4-5 interspace, while freely flowing clear cerebrospinal fluid was obtained by puncture at L2-3. Smear and culture of both specimens were negative.

Examination. At the time of her transfer to the Mount Sinai Hospital, the patient was pale, apprehensive, and in moderate distress. The temperature was 103°F. The general physical examination was normal. A positive Kernig sign was present; there was lumbar paravertebral muscle spasm and generalized tenderness over the spinous processes of L-1 through L-5. There was a patulous anal sphincter-leaking stool, and a marked hypesthesia to pinprick at S-3 through S-5. The deep tendon reflexes in the legs were markedly decreased; the motor power was intact.

Routine laboratory studies were negative except for a hemoglobin of 10.5 gm and a white blood cell count of 11,000/mm³ with normal differential. X-rays of the entire spine were normal. Several lumbar punctures from L-2 through L-5 were unsuccessful. A cisternal puncture was then performed. The fluid was xanthochromic and contained 1124 rbc/mm³ and 34 wbc with 20% polymorphonuclear leukocytes and 80% lymphocytes. The cerebrospinal fluid sugar was 52 mg%, and the protein was 106 mg%. Two cc of pantopaque were injected into the cisterna magna. Erect films demonstrated an intradural block at L3-L4 (Fig. 1).

Operation. A laminectomy of L-3 through L-5 was performed. No extradural pus was found. The dura was moderately thickened, and marked arachnoidal adhesions to the dura were present. There was a mass at L-4 which exuded non-odorous, thick, creamy, caseous material when the arachnoid was opened. Typical dermal elements of hair and organized debris were noted. The capsule of the cyst was adherent to several roots of the cauda equina. Subtotal removal of the cyst was accomplished, sparing all roots. The intrathecal space was irrigated with 10,000 units of bacitracin solution. A tight dural closure was made, and the operative site was not drained.

Microscopic findings were compatible with the diagnosis of dermoid cyst. The cyst was lined by simple squamous epithelium, supported by collagen, and contained hair follicles and sebaceous glands.

Postoperative Course. The patient made a

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gradual recovery. Postoperative antibiotics were discontinued after 1 week. Cultures of the fluid aspirated during surgery were negative, as were several postoperative blood cultures. The surgical wound healed without difficulty, and the patient was discharged from the hospital 4 weeks after surgery. At the time of discharge, moderate frequency of urination and enuresis were still present, and cystometrogram showed a moderately hypotonic bladder. She had excellent bowel control, and urination was accomplished by the use of Credé’s maneuver and oral bethanechol chloride. Slight hypesthesia at S-3 through S-5 remained.

Discussion

Early related reports by Walker and Bucy, Gross, Bagley and Arnold, List, and Hamby reviewed all the preceding cases and set forth the embryologic, diagnostic, and therapeutic principles that we continually draw upon today. Later reports by Campbell, Mount, and Sachs and Horrax helped to popularize the relationship to congenital dural sinus, added important pathological variants, and strongly emphasized basic surgical principles.

Walker and Bucy and later Ingraham and Matson emphasized the most widely accepted embryologic theory, which states that dermoids, epidermoids, and dural sinuses result from ectodermal dysplasia during development of the neural tube that normally takes place during the first fetal month. This abnormality arises when the neuroectoderm separates from the epithelial ectoderm. The epithelial defects thus arising may extend to varying depths. They may end immediately beneath the skin or extend through the lamina to the neural tissue. The preponderance of cases diagnosed in early childhood is directly related to the exogenous infection of the congenitally acquired sinus tracts to the skin. Thus, localized dermal infection, meninigitis, and epidural, subdural, and intramedullary abscesses are produced. Cases with no communication to the skin tend to have a long latent period and are most often diagnosed in later childhood and adolescence. Usually they show the classical signs and symptoms of spinal cord tumor.

The association of a ruptured dermoid cyst and resulting granulomatous meningitis has been reported. The contents of the dermoid cyst (sebaceous secretions, desquamated epithelial cells, and hair) are very irritating. Russell and Rubinstein believe that cholesterol is the most irritant element in the cyst and causes a granulomatous meningeal response. For this reason, we feel that “chemical meningitis” is a most descriptive term.

In the present case the relationship between the trauma and “chemical meningitis” is not clear. It is conceivable that the trauma could have changed the position of the cyst within the intradural space, thus causing a