Dermoid cyst of the fourth ventricle demonstrated on brain scan

Case report

Wojciech M. Bogdanowicz, M.D., and Donald H. Wilson, M.D.
Section of Neurosurgery, Hitchcock Clinic, Hanover, New Hampshire

A dermoid cyst of the fourth ventricle gave a positive brain scan. The presence of active glandular structures within the cyst may explain the uptake of radioisotope.

Key Words • brain scan • dermoid cyst • fourth ventricle

An intracranial dermoid cyst is a rare entity. Its occurrence in large series of intracranial tumors varies from 0.1% to 0.72%. No mention has been found in the literature of the value of brain-scanning in the diagnosis of dermoid cysts. Intracranial epidermoid cysts and teratomas have been mentioned as having negative scans. However, in many reports the rare dermoid tumor may have been hidden under the heading of “other tumors,” a frequent category in papers reviewing large series of brain scans.

We present a patient with a dermoid cyst of the fourth ventricle which was demonstrated by brain scan.

Case Report

In June, 1970, an 11-year-old girl was admitted because of progressive ataxia, headache, and vomiting. For the previous 7 years the child had been clumsy and unsteady on her feet. For 2 years she had complained of fronto-occipital headaches, which increased progressively and became associated with nausea and vomiting.

Examination. There was nystagmus with all directions of gaze, a tendency to fall to the right side, and mild dysmetria of all extremities. The intensity of truncal ataxia was out of proportion to the dysmetria. The fundi was normal. Skull films showed increased convolutional markings over the vault, but were otherwise normal. An electroencephalogram showed some irregular slow activity in the left centroparietal area. After blocking with sodium perchlorate, 3.6 mCi of technetium-99m were given intravenously, and brain scanning was performed at 1 and 2 hours by use of an Ohio Nuclear Dual Probe Scanner with 5 in. crystals. Anterior, posterior, left, and right lateral scintiscan views revealed a $4 \times 4 \times 4$ cm well-circumscribed area of increased isotope uptake in the midline of the anterior part of the posterior fossa (Fig. 1).

We believed the clinical findings and localizing brain scan represented an astrocytoma or ependymoma. Further diagnostic studies seemed unnecessary.

Operation. A suboccipital craniectomy was performed with the patient in a sitting position. When the dura was opened a large white mass protruded out of the fourth ventricle into the cisterna magna (Fig. 2). It had pushed the vermis and cerebellar lobes
Brain scan of dermoid cyst

Fig. 1. Brain scan. Lateral (left) and posterior (right) views show a well-circumscribed area of increased uptake in the midline of the anterior part of the posterior fossa.

upward. The tumor was well circumscribed and had the color and consistency of natural butter. Precautions were taken not to spill the contents of the tumor into the operative field. Before final removal of the most external portion of the mass, a single feeding vessel arising from the floor of the fourth ventricle was occluded with a silver clip and cut. The tumor was not adherent to the brain at any place nor was there any evidence of extension to the skull or scalp. The tumor weighed 57.5 gm. The histological appearance was characteristic of a dermoid cyst (Fig. 3).

Postoperative Course. Recovery was swift and uneventful. The patient was discharged only to be readmitted 16 days later with signs of meningeal irritation. No pathogenic organism could be found within the spinal fluid. The CSF contained 500 polymorphonuclear cells, 110 lymphocytes, 60 red blood cells, a protein content of 141 mg%, and a glucose content of 30 mg%. We suspected that this was a "chemical meningitis," but the late occurrence was unusual. She recovered and returned to full activity. Subsequent examinations have shown slow but steady improvement in the ataxia.

Discussion

The 7-year history of ataxia is comparable to the average of 8.5 years in patients with intracranial dermoid tumors. The long history results from the very slow expansion of the dermoid cyst by accumulation of sebaceous material and sweat secretions from scattered glandular structures and by deposition of keratohyaline granules resulting from proliferation and degeneration of the cells of the germinal layer.

As with acoustic neurinomas, craniopharyngiomas, and meningiomas, dermoid cysts consist of non-neuroglia tissues and thus possess different properties of permeability.

Fig. 2. Operative photograph showing a large white mass protruding from the fourth ventricle and displacing the vermis and cerebellar lobes upward.
FIG. 3. Photomicrograph of the cyst wall showing keratin above, epidermis across the center, and dermis in the lower portion with a sebaceous gland and hair shaft on the right. H & E, × 10.

The uptake of radionuclides in these tumors should not differ significantly from the uptake observed in similar but normal tissues of the body.

The fact that a dermoid cyst, in spite of scanty vascularity, consists of small but active glandular components may explain the uptake of technetium.

Summary

We have reported a case of a dermoid cyst located in the fourth ventricle which gave a positive brain scan. Active glandular structures within the cyst were probably responsible for the uptake of radioisotope in a ratio comparable to that in normal glandular structures throughout the body.

References


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Address reprint requests to: Wojciech M. Bogdanowicz, M.D., Section of Neurosurgery, Hitchcock Clinic, Hanover, New Hampshire 03755.