Preoperative diagnosis of a ruptured intracranial dermoid cyst by computerized tomography

Case report


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A case of ruptured intracranial dermoid cyst in the right middle fossa is reported. A definitive diagnosis of the lesion and the fact that it had ruptured was made possible by specific computerized tomographic findings. The findings were confirmed at surgery.

Key Words • computerized tomography • preoperative diagnosis • intracranial dermoid cyst

Intracranial dermoid cysts have been diagnosed preoperatively with greater frequency since the advent of computerized tomography (CT). The characteristic CT appearance of fat gives presumptive evidence of the histology of the lesion.

We are reporting a case of a ruptured intracranial dermoid cyst diagnosed preoperatively by CT. A unique feature of this case is that the fatty contents of the tumor spilled into the subarachnoid space with no extension into the ventricular system.

Case Report

This 26-year-old right-handed salesman was seen in December, 1976, for evaluation of headaches and seizures.

The patient had an episode of generalized seizures 3½ years before his present admission. After a negative work-up including radioisotope brain scan and electroencephalography (EEG), he was placed on Dilantin (phenytoin sodium) therapy. Eighteen months later he discontinued the Dilantin and was well until 2 weeks before admission, when he had another generalized seizure. In November, 1976, he had complained of daily bouts of bifrontal, non-throbbing headaches, which were usually worse in the morning. The rest of the history and physical examination were unremarkable.

Examination. Cranial CT, performed in December, 1976, as an outpatient procedure, showed a large mass lesion in the right middle cranial fossa. Absorption values within the
FIG. 1. Computerized tomography section showing a low-absorption mass circumscribed by a calcification in the right temporal fossa. Readings beneath cursor indicate 55 Hounsfield units, that is, fat density.

FIG. 2. Coronal CT section showing the subtemporal location of the lesion. Note the calcific rim around the mass.

FIG. 3. Computerized tomography section showing fat-density lesions in the right Sylvian fissure and over the cerebral convexity.

mass were in the range of -20 to -60 Hounsfield units suggesting fat density (Fig. 1). A curvilinear rim of high absorption consistent with calcification partially circumscribed the lesion (Fig. 1). Computerized tomographic sections obtained in the coronal plane showed that the mass was subtemporal in location (Fig. 2). In addition, multiple small lesions, again with density measurements in the fat range, were scattered over the convexity of the brain and in the right Sylvian fissure (Fig. 3). No enhancement was noted in the lesions in sections obtained after the intravenous injection of 100 cc of Renografin 60. The ventricular system was not enlarged and there was no shift of midline structures. No fat or fat-fluid levels were present in the ventricles. Findings were interpreted as a subtemporal dermoid cyst with rupture into the subarachnoid space.

Ancillary studies included skull x-ray films and right brachial arteriogram. The skull films showed a calcified rim in the right middle fossa. The arteriogram demonstrated an avascular subtemporal extra-axial mass lesion.

Operation. At surgery, yellowish cheesy material was found along the right Sylvian fissure. This material was traced to a capsule
CT diagnosis of ruptured intracranial dermoid cyst

surrounding a mass that arose from the floor of the middle fossa and extended upward and posteriorly, compressing the tip of the temporal lobe. A tiny opening in the capsule of the cyst directly communicated with the Sylvian fissure, which had a rather thick arachnoid membrane. Adhesions to the medial surface of the temporal lobe were noted.

On histological examination, the interrupted cyst wall was seen to be lined by stratified squamous epithelium. Within the underlying collagenous tissue, skin appendages consisting of hair follicles and many sebaceous glands could be recognized.

Postoperative Course. The patient had an uncomplicated postoperative course with full recovery. He has had no further seizure activity.

Discussion

Plain skull x-ray visualization of an intracerebral dermoid cyst as a radiolucent mass has been a rare occurrence. Only two cases have been reported since it was first described by Gross in 1945. Recent attention has been called by Maravilla to the presence in horizontal-beam skull x-ray studies of an intraventricular fat-fluid level secondary to the rupture of an intracranial dermoid cyst. Fat-fluid levels may be diagnosed by CT as in the case described by Cornell, et al. In their case, the radiolucent area was at first thought to represent air until the absorption values at CT indicated the presence of fat.

Diagnosis of fat-containing dermoid and epidermoid tumors by CT scanning has been reported in several instances. In 1977, Laster, et al., reported for the first time the preoperative diagnosis of two intracranial dermoid tumors that ruptured into the subarachnoid space. This diagnosis was made possible because of the typical CT appearance of fat globules free in the subarachnoid space along with fat-fluid levels in the lateral ventricles, plus the cystic-appear ing tumor.

In the present case the dermoid cyst ruptured only into the subarachnoid space and no intraventricular fat could be demonstrated at CT or at surgery.

It is of interest to note that the rapidly fatal consequences of the escape of dermoid cyst contents into the cerebrospinal pathway anticipated by Russell and Rubinstein and reported by Krieg and Olivecrona have not been observed in Laster’s cases nor in ours. Notwithstanding, a chronic granulomatous arachnoiditis was certainly present in our case. The most irritant element is considered to be the cholesterol derived from the breakdown of keratin.

References


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