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Demonstration of a Symptomatic Intraventricular Cyst Using Direct Intraventricular Metrizamide Instillation

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Some intraventricular mass lesions have proven difficult to delineate, even with a contrast-enhanced CT scan. The combination of intrathecal contrast and CT scanning has been especially useful in studying the ventricles and subarachnoid spaces of both the brain and spinal cord. We report a case in which we instilled metrizamide directly into the body of the left lateral ventricle to show the extent of a suspected intraventricular cyst on a contrast-enhanced CT scan.

Case Report

A 30-year-old man was examined for a complaint of pressure over the left occipital and frontal regions occurring intermittently over the past 2 years. In the 4 months before presentation, he had had episodes of violent temper, brief losses of consciousness, and episodic numbness of his right side. His history also included repeated minor head trauma and recent loss of appetite and weight. Vital signs, routine laboratory tests, and general physical and neurologic examinations were normal.

A CT scan of the head, pre- and post-contrast enhancement (Conray-60, 100 ml intravenously), suggested a nonenhancing cystic lesion in the atrium of the left lateral ventricle causing expansion of the atrium and displacement of the choroid plexus anterolaterally (Fig. 1). The walls of the suspected cyst were not seen at any window level or width. Density measurements equaled that of adjacent CSF. Three mm of metrizamide (170 mg/ml), instilled into the left occipital horn via a left parietooccipital burr hole under local anesthesia, outlined an ellipsoid mass. The intraventricular cyst did not communicate with the CSF (Fig. 2). A delayed CT scan was not obtained. We elected not to puncture the lumbar subarachnoid space to instill either air or metrizamide because of the potential risks associated with a supratentorial mass lesion. We were also uncertain as to whether air would adequately enter the ventricles to delineate the lesion.

At surgery, a 4-cm cyst arising from the choroid plexus in its inferolateral aspect was subtotally resected without incident. Histologic examination of the cyst showed it possessed an avascular fibrous wall attached to choroid plexus but lacked an inner cellular lining (Fig. 3). Adherent to the outer surface of the cyst, however, were focal zones of neuroglial tissue covered by ependyma (Fig. 4).

These features were considered sufficient to classify the cyst as one of the choroid plexus. The patient discharged himself against medical advice 8 days after surgery and is lost to follow-up.

Discussion

To our knowledge, this is the second cyst to be outlined via intraventricular metrizamide introduced through a burr hole [1]. The differential diagnosis of a cyst near the ventricle includes colloid cysts, choroid plexus cysts, arachnoid cysts, and ependymal cysts. Cystic tumors [2], which can be demonstrated by other techniques, may also be successfully evaluated by our technique.

Choroid plexus cysts are often seen in the lateral ventricle at autopsy. Their frequency increases with age and they are considered by some to be a degenerative change [3]. Characteristic features include a location within the stroma of the choroid plexus, proliferation of fibrous tissue and arachnoid cells, and psammoma bodies. The cysts may be septated and are rarely large enough to cause symptoms. The histology of our case resembles that of eight other cases reported in the literature that were also symptomatic and located in the lateral ventricle [1, 4–10]. The absence of a choroidal epithelial lining in our case, however, may be due to pressure atrophy caused by entrapped fluid in the cyst. Noncommunicating ependymal cysts are uncommon and when located in the cerebral hemispheres are usually in close apposition to the ventricle or subarachnoid spaces [11–17]. These cysts are smooth-walled, lined with single- or multilayered cuboidal or columnar cells that are often ciliated, and (uncommonly) may show structural features similar to normal ependyma [13, 18]. It is unlikely that these lesions are colloid cysts. On CT, they arise from the paraphysis, in the third ventricle, are usually hyperdense, and may enhance with contrast [19]. Histologically, they are lined by cuboidal secretory cells, the colloid content of the cyst being composed of secretory products, desquamated cells, and, occasionally, resolving hemorrhage. Arachnoid cysts adjacent to a ventricle may

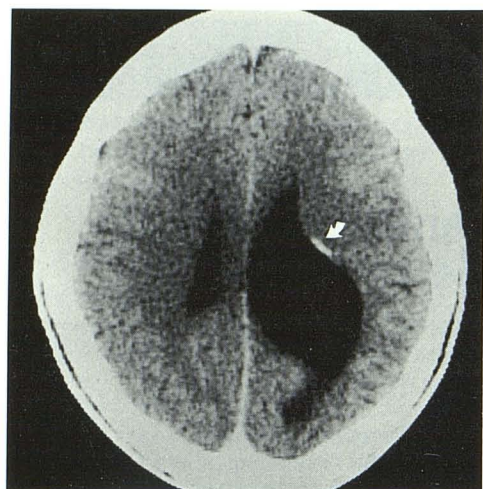
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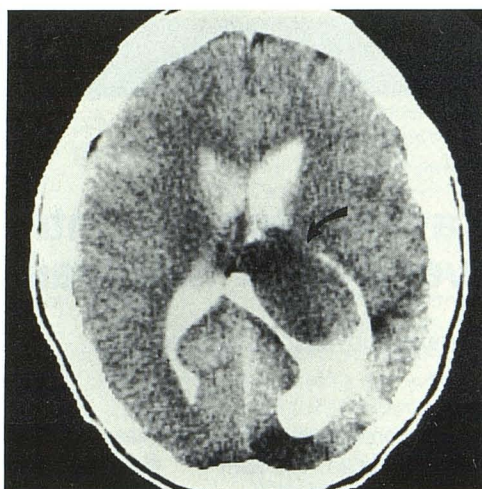
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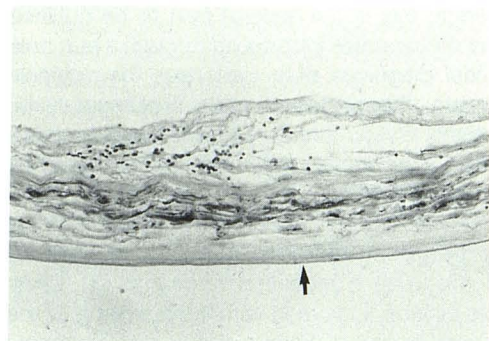
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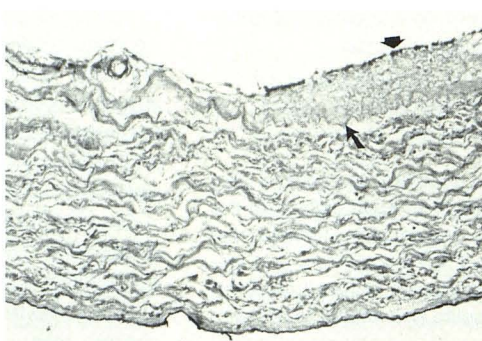
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Fig. 1.—Axial CT scan after intravenous contrast (Conray-60, 100 ml). Note enlarged atrium of left lateral ventricle and choroid plexus displaced anterolaterally (arrow). No walls of this cyst were seen, even with adjustment of window level and width.

Fig. 2.—Axial CT scan at approximately same level as Fig. 1 after 3 ml of metrizamide (170 mg/ml) instilled via twist-drill burr hole into left lateral ventricle. Note ellipsoid intraventricular mass, which does not fill with metrizamide (arrow).

Fig. 3.—(H and E $\times 338$) Pathologic section of cyst. Note that inner wall is acellular and composed of collagen (arrow).

Fig. 4.—(Van Gieson $\times 338$) Focal zones of neuroglial tissue (arrow) covered by ependyma are adherent to outer surface of cyst (arrowhead).

occasionally mimic an intraventricular cyst. The separation of cyst from ventricle using metrizamide has been successful [1, 20, 21]. Delayed scanning may also show retention of metrizamide in the cyst [20, 21].

Koto et al. [22] made the observation that cysts traditionally called "ependymal" are heterogeneous in nature and can be ependymal, choroidal, epithelial, or even teratogenous. Shuangshoti and Netsky [23] reviewed epithelial cysts and their relationship to ependyma and choroidal plexus. They and others [14, 24] suggest that all such cysts (including colloid cysts) are neuroepithelial in origin whether related to or separate from the ventricles or the central canal of the spinal cord.

In summary, we believe our case to be a choroid plexus cyst. Direct intraventricular instillation of metrizamide is a valuable adjunctive technique in the demonstration and diagnosis of intraventricular mass lesions.

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