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## Entrance of Metrizamide into an Intraventricular Cysticercosis Cyst

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Although many computed tomographic (CT) features of cysticercosis cerebri have been described [1–5], the recognition of ventricular cysticercosis cysts on plain CT scans is still generally difficult or impossible. Recently, we observed entrance of metrizamide into a ventricular cysticercosis cyst after ventriculography. This new feature may be specific for intraventricular cysticercosis cysts, particularly in conjunction with other previously recognized features of these cysts on contrast studies [5].

### Case Reports

#### Case 1

A 27-year-old Mexican-American man suffered bifrontal and occipital headaches, nausea, and vomiting for about 1 month. Examination was unremarkable except for bilateral papilledema. CT scans showed dilatation of the right lateral ventricle. Metrizamide ventriculography was performed through a ventriculostomy tube placed in the anterior part of the body of the right lateral ventricle. A filling defect at the lateral aspect of the atrium of the right lateral ventricle was demonstrated (fig. 1A).

Repeat CT about 5 hr after ventriculography showed an extremely dense, smooth, rounded lesion at the lateral aspect of the atrium of the right lateral ventricle (fig. 1B), corresponding to the filling defect seen on the metrizamide ventriculogram. The high density lesion measured 357 Hounsfield units (H) at its center, which was denser than the periphery. The surrounding ventricular fluid containing metrizamide measured about the same as the opacified lesion.

A 24 hr follow-up CT scan showed a marked decline in the density of the lesion to only 95 H (fig. 1C). The cerebrospinal fluid cysticercosis titer was strongly positive (1:1024). The patient was treated with a ventriculoperitoneal shunt with the belief that a cysticercosis cyst within the ventricular system had been demonstrated.

### Discussion

Cysticercosis cerebri may have meningeal, parenchymal, or ventricular forms, or a combination of these [6, 7]. CT

features include calcifications and low density cysts in the parenchyma or ventricles. Contrast enhancement may or may not occur after intravenous injection of iodinated contrast material [1, 2, 5].

Ventricular cysticercosis occurs in 15%–18% of cases [6, 8–10]. The ventricular cysts generally cannot be diagnosed directly without intraventricular contrast material because they appear about the same density as cerebrospinal fluid on CT scans. However, dilatation of the fourth ventricle out of proportion to the degree of dilatation of the third and lateral ventricles has been suggested as an indication of a cysticercosis cyst within the fourth ventricle [1].

A ventricular cysticercosis cyst appears as a mass lesion on metrizamide or air contrast ventriculography. The cysts may be mobile and can change shape [5, 11, 12]. Contrast enhancement by intravenous injection only occurs in the rare instances of surrounding parenchymal or ventricular wall adhesions [5].

Our case demonstrates that metrizamide may enter a ventricular cysticercosis cyst. This may be by absorption, but the exact mechanism remains open to speculation. The cyst appeared very much denser on the CT done 5 hr after ventriculography than 24 hr later. The fact that the density of the cyst was greatest at its center showed the metrizamide had entered the cyst rather than merely coating the cyst wall.

We have seen three other patients, all Mexican-American, with intraventricular cysticercosis cysts demonstrated by metrizamide ventriculography. A 27-year-old woman had a large right lateral ventricular cyst of 30 H 2 hr after metrizamide ventriculography (fig. 2A). A 31-year-old man had a third ventricular cyst of 8 H 1 hr after a metrizamide ventriculogram (fig. 2B). A 43-year-old man had a left lateral ventricular cysticercosis cyst of 10 H 1 hr after the metrizamide ventriculogram (fig. 2C).

All three patients had high cerebrospinal fluid cysticercosis titers of 1:256–1:1024, but little metrizamide enhancement on CT done 1–2 hr after ventriculography. One cyst was 30 H; this apparent increase in density may well

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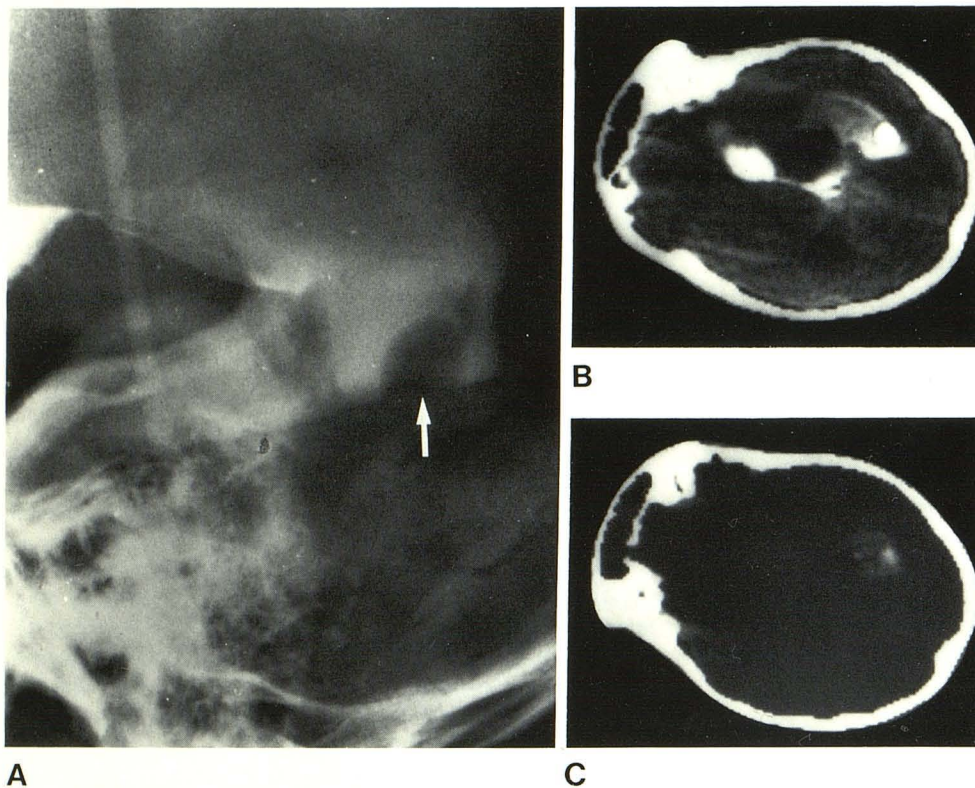


Fig. 1.—A, Metrizamide ventriculogram. Small mass in lateral aspect of atrium of right lateral ventricle (arrow). B, CT scan 5 hr later. Extremely dense, smooth, rounded lesion of 357 H in same site. C, 24 hr after initial scan. Density has decreased to 95 H.

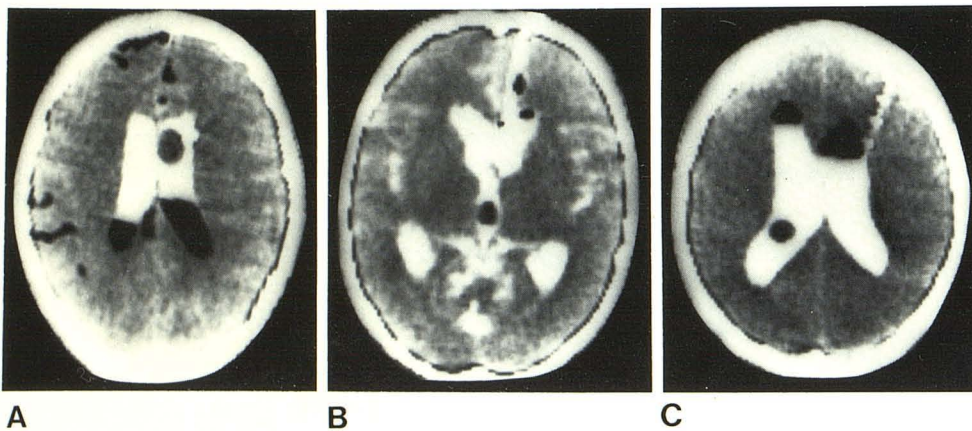


Fig. 2.—Three other patients with suspected cysticercosis cysts after intraventricular metrizamide injection. A, 2 hr after metrizamide. Right lateral ventricular cyst of 30 H. B, At 1 hr. Third ventricular cyst of 8 H. C, At 1 hr. Left lateral ventricular cyst of 10 H.

have been due to partial volume effect. We do not know if any of these cysts became denser later, nor do we know when the cyst was initially opacified in our first patient. We intend to study the opacification pattern with serial scans on such cases in the future.

The wall of the cysticercosis cysts consists of three layers: an internal reticular and fibrillary layer, a thin media which has a pseudoepithelial structure, and an external dense and amorphous layer. This membrane plays the role of obtaining nourishing substances from the host tissue, which then pass into the vesicular fluid and in turn into the parasite [13]. Therefore, it is postulated that metrizamide enters the cysticercosis cyst by diffusion across the membrane along with

the nourishing substances. However, in our case, metrizamide may have entered the cyst in some other way.

Whether entrance of metrizamide into a cysticercosis cyst is specific awaits further experience. Intraventricular ependymal and arachnoidal cysts may be difficult to differentiate because the densities may be similar to that of cerebrospinal fluid. Metrizamide within such cysts has not been described, although a case of delayed metrizamide absorption by a posterior fossa arachnoid cyst has been reported [14]. Intraventricular tumors such as ependymomas, choroid plexus tumors, or meningiomas would not be difficult to differentiate because they are not of cerebrospinal fluid density. For the time being our case seems unique.

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