Cerebrospinal Fluid Abdominal Cyst

Computed Tomographic Resolution of a Sonographic Dilemma

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A case of subhepatic cerebrospinal fluid cyst, an uncommon complication of ventriculoperitoneal shunting, is presented. Sonography could not reliably prove shunt tubing to be entering the cystic spaces. Results of computed tomography scanning were definitive.

KEY WORDS: Hydrocephalus; Ventriculoatrial shunt; ventriculoperitoneal shunt; ventriculoperitoneal shunt complications; Cerebrospinal fluid pseudocyst; Computed tomography; Ultrasonography; Abdominal; Subhepatic

Before the availability of whole-body computed tomography and ultrasonography, preoperative diagnosis of abdominal cereospinal fluid (CSF) cysts had been difficult and potentially invasive [1–8]. The results of computed tomographic scanning in a case of subhepatic CSF cysts are presented. These findings allowed resolution of a sonographic dilemma.

Case Report

A newborn girl with an occipital encephalocele and hydrocephalus, believed to be secondary to a Chiari type II malformation, underwent repair of the encephalocele and ventriculoatrial shunting for the hydrocephalus shortly after birth in 1973. The ventriculoatrial shunt required multiple revisions and was finally replaced with a ventriculoperitoneal shunt in January 1982. Approximately 1 month after the shunt was placed, the patient complained of abdominal pain and lethargy. She was admitted to University of Michigan Hospitals. B-mode and real-time sonography performed on the day of admission demonstrated subhepatic cystic masses, but could not definitely define the peritoneal catheter near or within them despite protracted attempts at visualization (Figure 1). Computed tomographic body scans (GE 8800 scanner, small-body calibration, 1-cm sections at 2-cm intervals) performed 1 day after admission showed loculated subhepatic masses with low attenuation. Tubular structures representing the peritoneal catheter were clearly demonstrated along the walls of these masses (Figure 2). This combination of findings was totally consistent with malfunction of the peritoneal shunt and intraabdominal CSF cysts. On the basis of these results, the patient underwent reimplantation of the abdominal catheter with drainage of a large loculated subhepatic CSF cyst. Shunt tubing was found to be tightly adherent to the cyst walls. Cultures of the cyst fluid yielded negative results. The patient did well postoperatively.

Discussion

Although the development of intraabdominal CSF cysts as a complication of ventriculoperitoneal shunting is unusual [1–8], multiple case reports have appeared demonstrating methods of imaging diagnosis. Plain films, excretory urography, and barium studies demonstrating abdominal masses [2] and/or tense displacement of the peritoneal catheter [3] have been helpful but not definitive. Independent case reports employing B-mode and real-time sonography [6] or computed tomography alone [1–8] have appeared. The correlation of sonography with computed tomography has not been discussed. Diagnostic dilemmas, such as that demonstrated in our case, appear to require computed tomography for positive diagnosis. Factors complicating sonographic visualization were believed to include copious amounts of intestinal gas and adhesion of shunt tubing to the walls of the pseudocyst. A catheter adherent to a cyst wall is difficult to visualize with sonography, whereas a catheter floating free in a cyst is seen more readily. Computed tomography can demonstrate both free-float-

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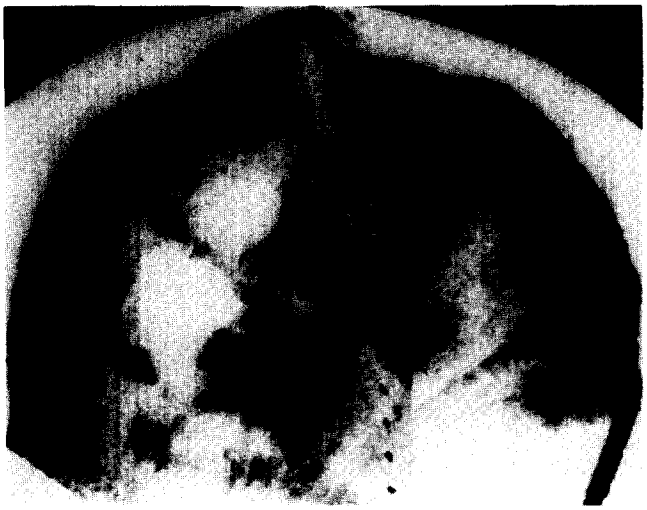

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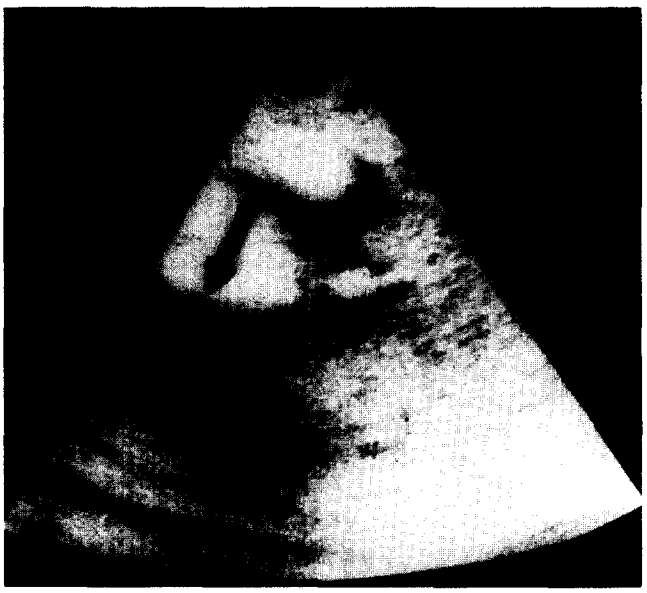

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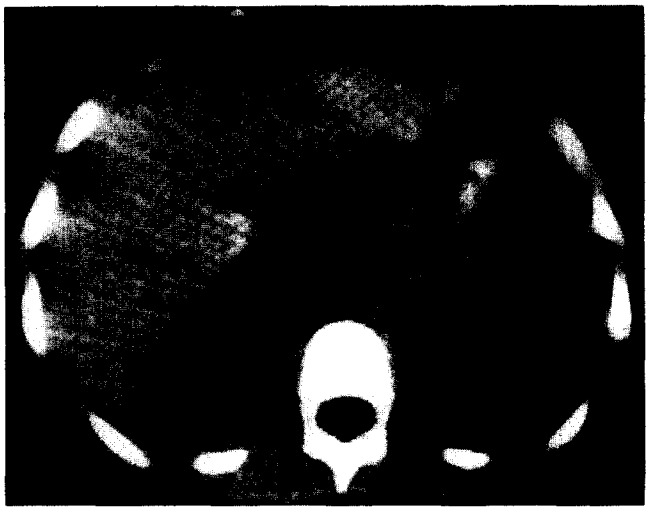
Figure 1. *B-mode transverse sonographic section 7 cm below the xyphoid (***A***) and real-time oblique sector sonogram (***B***), demonstrating fluid-filled subhepatic cysts. Only retrospectively could shunt tubing be definitely identified near the cyst walls (arrows).*



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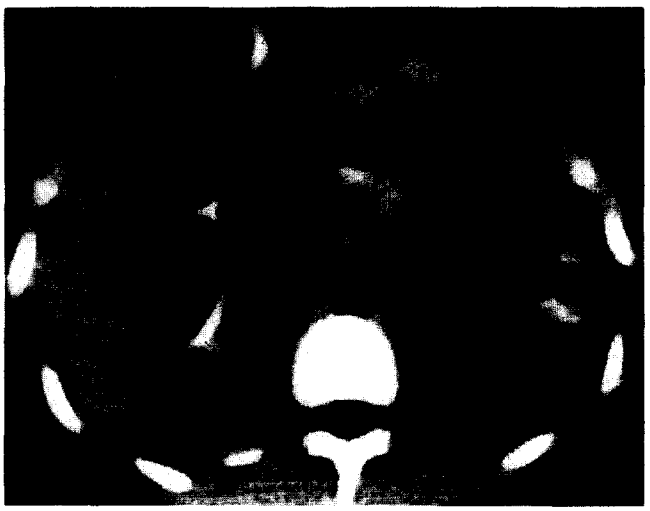

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Figure 2. (**A**) *Ventricular tubing tunneled within the ventral subcutaneous tissue (arrow).* (**B**) *Section 2 cm caudal to that shown in* (**A**)*, demonstrating peritoneal tubing now traversing the ventral abdominal wall. Loculated, subhepatic masses of low attenuation with shunt tubing along their walls (arrows) are visible. Regions of interest (mean Hounsfield units) in these masses measured approximately −5.0. A water standard introduced into the stomach measured approximately −2.2.*

ing catheters and those adherent to cyst walls with equal accuracy. In this case the catheter could be seen with sonography only in retrospect.

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