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Celebrating 35 Years of the AJNR

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John Caffey Award

Sonography of the Caudal Spine and Back: Congenital Anomalies in Children

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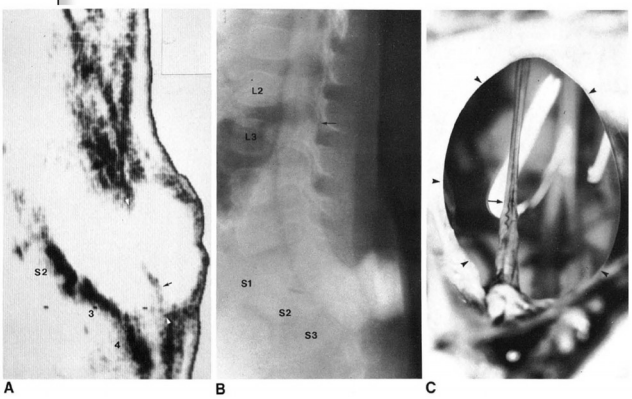
Articulated-arm, B-mode 3.5–5.0 MHz sonograms from 27 children with congenital anomalies of the caudal spine were analyzed *retrospectively* and correlated directly with patient appearance, preoperative myelograms, intraoperative photographs, and pathologic specimens to determine how effectively sonography could display the major pathologic features known to be present. Anterior spina bifida, posterior spina bifida, and (partial) sacral agenesis were displayed as focal absence of normal spinal echoes and distortions of the paraspinal/gluteal muscles. Subcutaneous anechoic spaces continuous with the spinal canal through a spina bifida identified the presence, site, and configuration of each meningocele present. Highly echoic masses were easily discerned at the sites of 14 of 16 lipomas and at the solid fibroadipose portions of both sacrococcygeal teratomas. Echoes from the surface of the spinal cord and occasionally from the central canal identified abnormally low cord position in 16 of 17 cases and identified herniation of the cord (or filum) into a concurrent meningocele in seven of 10 cases. Sonographic display of an anechoic meningocele bordered by a lobular, highly echoic, subcutaneous lipoma that inserted onto a low-lying or herniated spinal cord reliably identified lipomyelomeningocele. Despite limitations discussed in the text, initial experience suggests that sonography will be a useful method for screening patients for possible tethered spinal cord, (lipo)(myelo)meningocele, sacrococcygeal teratoma, and other anomalies of the caudal spinal axis.

In patients with myelodysplasia and other anomalies of the caudal spine, cranial sonography has been widely accepted for assessing concurrent intracranial pathology and for intraoperative placement of ventricular shunt catheters [1–3]. Renal sonography has proved equally valuable for detecting associated renal agenesis, renal ectopia, and hydronephrosis [4, 5]. Spinal sonography, however, has received relatively little attention, even though sonographic windows are provided by the incomplete ossification of the posterior elements in children under 1 year of age and by spina bifida [6–19].



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Sonography of Brain Tumors in Infants

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Cranial sonograms of six children with brain tumors (one newborn, four infants, a one 4-year-old child) are presented. In four, sonography showed a large tumor ma and displacement of adjacent structures. In two, the tumors were demonstrated areas of abnormal brain parenchymal echogenicity without obvious mass effect. Two the tumors were diffusely echogenic, one was primarily cystic, and three were of mix echogenicity. Areas of cystic degeneration and calcification within the tumors were v demonstrated. Correlation was made with cranial computed tomography (CT) in patients; in each case sonography accurately demonstrated the location and extent the tumor. Since sonography is used as a screening procedure in infants with a lar head or an abnormal neurologic examination, sonography may be the first examinat to demonstrate the tumor mass. However, since the sonographic features are specific for neoplasms, further clarification of the process by CT should be recc mended.

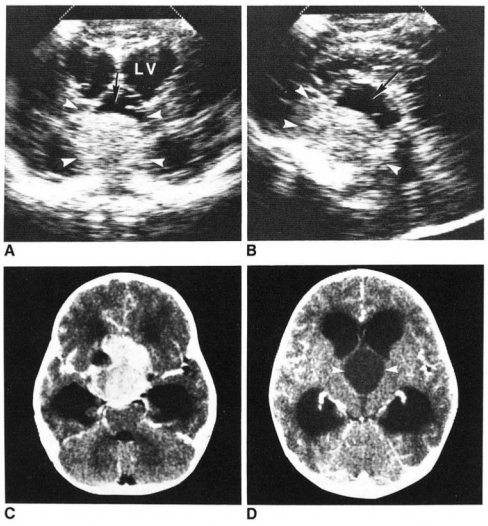
Sonography has become an important imaging method for the evaluation of infant head. Its value in the recognition and follow-up of patients with hydrocepha and intracranial hemorrhage has been well established [1–6]. However, little inf mation is available about the sonographic appearance of brain tumors [1, 2, 7– We present our experience with brain tumors in six patients.

Materials and Methods

Of 1528 children who had cranial sonograms at Children's Hospital Medical Cen Cincinnati, from May 1978 to November 1982, six patients with histologically proven br tumors were identified. Five patients were under 1 year of age and one patient was 4 ye old when the diagnosis was made. Cranial sonograms were obtained with a static or r time scanner or both in axial, coronal, and sagittal planes. A 3.5 or 5.0 MHz transducer w used. In the five infants under 1 year old, the sonogram was obtained through the op sutures and fontanelles. In the 4-year-old child, sonography was possible because he h split sutures due to increased intracranial pressure. Sonographic findings were compa with computed tomographic (CT) findings in all six patients. Five patients had plain films the skull and three patients had brain angiography. The patients' charts were reviewed clinical information.

Results

Most patients presented with nonspecific symptoms of increased intracra pressure. Sonographic and radiographic findings are summarized in table 1. Th were four astrocytomas, one teratoma, and one ependymoma. In five of the children, the tumor was supratentorial. In four (cases 1, 3, 4, and 5), sonograp showed a large tumor mass and displacement of adjacent structures (figs. 1, and 4). In two (case 2 and 6), there were no mass effects, and sonograp demonstrated changes in brain parenchymal echoes and architecture (figs. 2



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