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CT Recognition of Lateral Lumbar Disk Herniation

Alan L. Williams[1]
Victor M. Haughton
David L. Daniels
Robert S. Thornton

Although computed tomography (CT) has been shown to be useful in diagnosing posterolateral and central lumbar disk herniations, its effectiveness in demonstrating lateral herniated disks has not been emphasized. The myelographic recognition of those herniations may be difficult because root sheaths or dural sacs may not be deformed. A total of 274 CT scans interpreted as showing lumbar disk herniation was reviewed. Fourteen (5%) showed a lateral disk herniation. The CT features of a lateral herniated disk included: (1) focal protrusion of the disk margin within or lateral to the intervertebral foramen; (2) displacement of epidural fat within the intervertebral foramen; (3) absence of dural sac deformity; and (4) soft-tissue mass within or lateral to the intervertebral foramen. Because it can image the disk margin and free disk fragments irrespective of dural sac or root sheath deformity, CT may be more effective than myelography for demonstrating the presence and extent of lateral disk herniation.

The recognition of a herniated lumbar intervertebral disk by myelography, even with water-soluble contrast agents, may be difficult where the anterior epidural space is large, such as at L5–S1, or when the herniation is lateral [1–5]. Computed tomography (CT) has been shown to be effective in the diagnosis of herniated disks [6–10], particularly the central and posterolateral ones. We illustrate the usefulness of CT in the diagnosis of lateral lumbar disk herniations.

Materials and Methods

During a 3 year period, 1,523 patients with low back and/or sciatic pain were studied with CT at the Milwaukee County Medical Complex. Our CT scanning techniques have been described [6, 8, 10]. In 274 patients (18%), evidence of a herniated lumbar disk was seen by CT. We reviewed the CT scans in these 274 patients to determine the frequency and CT appearance of lateral lumbar disk herniation. We defined a lateral disk herniation as one within or lateral to the intervertebral foramen. These criteria were satisfied in 14 patients. Six of them were confirmed surgically and eight were managed conse

Results

In the 14 cases, displacement of fat within the interverte identified in each one, whereas a dural sac deformity was r Focal protrusion of the disk margin resulting in narrowing of foramen was seen in 12 patients, and a soft-tissue mass late was identified in three.

Representative Case Reports

Case 1

A 40-year-old woman had 6 weeks of severe left sciatic pain. Neu revealed left L5 and S1 radiculopathy. CT demonstrated displacemen L5–S1 intervertebral foramen and a large soft-tissue mass lateral to

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[1]All authors: Department of Radiology, Medical College of Wisconsin, and Milwaukee County Medical Complex, 8700 W. Wisconsin Ave., Milwaukee, WI 53226. Address reprint requests to A. L. Williams.

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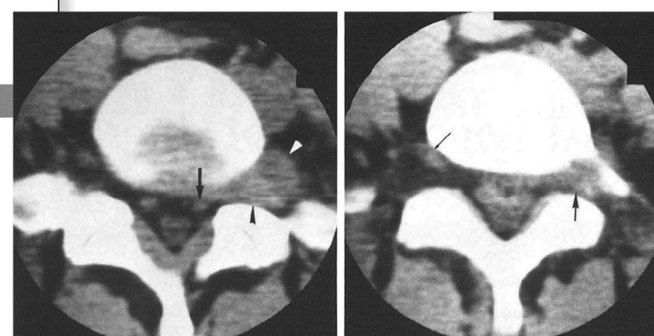

Atrial Diverticula in Severe Hydrocephalus

Thomas P. Naidich[1]
David G. McLone[2]
Yoon S. Hahn[2]
Joseph Hanaway[3]

Massive ventricular dilatation causes stretching and dehiscence of the fornix with formation of unilateral or bilateral pial pulsion diverticula of the inferior medial wall of the atrium. Enlargement of the pial pouch creates a dramatic subarachnoid cyst that may herniate downward through the incisura into the lateral mesencephalic, precentral cerebellar, and superior vermian cisterns where it displaces the brain stem, vermis, and fourth ventricle. Lateral ventricular diverticula may be identified and distinguished from the dilated fourth ventricle and dilated suprapineal recess, with which they are so commonly confused, when all of the following signs are apparent on computed tomography (CT): (1) marked unilateral or bilateral atrial dilatation; (2) focal dehiscence of the medial atrial wall; (3) ipsilateral shortening of the tentorial band in axial section; (4) focal defect in the tentorial band in coronal section; (5) draping of the medial atrial wall over the free margin of tentorium, with continuity of cerebrospinal fluid density around the edge of tentorium in axial and/or coronal sections; (6) bowing of the crus (or crura) of fornix; (7) separation of fornix from splenium, with visualization of the hernia ostium; (8) asymmetrical position of the choroid plexi, which attach to and define the lateral borders of the fornices; (9) contralateral displacement of the internal cerebral veins; and (10) septa separating diverticulum from third ventricle.

Proper surgical management of the patient with massive hydrocephalus and a midline, incisural, cerebrospinal fluid (CSF)-density "cyst" requires accurate preoperative identification of the nature of the "cyst" and its relation to the ventricular system. Primary arachnoid and ependymal cysts, which *cause* hydrocephalus, may be treated by extirpation or direct shunting of the cyst with consequent relief of hydrocephalus. Focal ventricular dilatations that *result* from hydrocephalus are treated most effectively by simple shunting of the lateral ventricles. Initial difficulty in differentiating among primary arachnoid cysts, enlargement of the suprapineal recess of the third ventricle, pulsion diverticulum of the medial atrial wall, and upward bulging of the dilated fourth ventricle led to review of the relevant anatomy and pathology and elaboration of criteria for accurate computed tomographic (CT) diagnosis of the pulsion diverticulum of the medial wall of the atrium.

Materials and Methods

Serial CT scans of 300 pediatric and adult patients with ventricular dilatation were reviewed to select 60 patients satisfying the Meese et al. [1] criteria for extreme hydrocephalus. Patients believed to have atrophy on the basis of clinical or CT criteria were rigorously excluded. In 10 cases, where patient benefit justified the risk, CT diagnoses of atrial diverticula, arachnoid cyst, etc. were confirmed by metrizamide CT ventriculography (MCTV), metrizamide CT cisternography (MCTC), or surgical exploration [2–6].

Anatomic and Pathologic Basis for CT Signs

The medial wall of atrium is formed by the splenium above and behind, the symmetric