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Recognition of Cervical Soft Disk Herniation by Contrast-Enhanced CT

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A large number of patients with suspected cervical disk herniation were examined by high-resolution computed tomography (CT) with intravenous contrast enhancement. Thirteen herniated disks have been diagnosed by this technique. The disk protrusion causes displacement and a resultant filling defect in the epidural plexus, which is visualized after contrast enhancement. In some cases not clearly diagnosable by this method or by conventional myelography, the combination of intrathecal metrizamide and CT was most valuable.

Soft disk herniation is less common in the cervical region than at the lumbar level. First described by Stookey [1], cervical disk herniations were classified by Spurling [2] as central, paracentral, and posterolateral according to the direction of the extruded material. Up to now radiologic diagnosis has been quite difficult, requiring aggressive procedures. Plain film examination may disclose abnormalities [3] and remains the first radiologic procedure to perform. Recognition of indirect signs [4] may suggest a diagnosis of cervical disk herniation. Myelography [5] has usually been required to demonstrate this condition, but may occasionally yield false-negative results [3]. Diskography has also been advocated [6].

Diagnosis of cervical soft disk herniation by computed tomography (CT) has been reported previously [7] with mixed results. However, technologic improvements have markedly increased the diagnostic accuracy of CT. In our experience, the use of high-resolution CT with intravenous contrast enhancement may lead to a diagnosis of certitude, thus making more invasive procedures unnecessary in many cases of suspected cervical disk herniation.

Materials and Methods

The ability to recognize soft disk herniation by CT requires a high-resolution scanner, digital radiography, and the use of thin (2 mm) sections. The sections are contiguous and scanning is performed in a plane strictly parallel to the intervertebral space, as seen on digital lateral radiography. The patient is supine and is asked to breathe normally and to avoid movement.

Examinations in our institution were performed on a Somatom 2 (Siemens) CT scanner after intravenous injection of 250 ml Iopaque (150 mg I/ml). Intravenous contrast material enhances the epidural space, which was well visualized behind the vertebral body as well as at the level of the disk on our scans (fig. 1). More than

120 cervical spines have been examined in this manner since the installation of a high-resolution scanner in our CT unit.

Results

An early case in our experience illustrates the value of intravenous contrast injection in demonstrating a lateral disk herniation extending into the intervertebral foramen. A young man presented with a typical unilateral cervical radiculopathy. Myelography was negative. Plain CT failed to show definite abnormality. CT with intravenous contrast enhancement demonstrated a lateral hyperdense lesion with mean attenuation values ranging from 70 to 100 Hounsfield units (fig. 2). After possible diagnoses of meningioma and neurinoma were considered, surgery disclosed cervical disk herniation.

Since this case, we have routinely used intravenous contrast enhancement on all patients with suspected cervical pathology referred for CT examinations. By this technique we have detected 12 other surgically verified soft disk herniations, either posterolaterally or centrally located (fig. 3). We have been able to identify high-density structures corresponding to venous and ligamentous tissues on contrast-enhanced CT scans, as well as slightly hyperdense areas corresponding to the herniated disk material.

Discussion

Soft disk herniation occurs most frequently at the C5-C6 or C6-C7 interspace and may be difficult to detect either on conventional myelography or on plain CT. CT with intravenous contrast enhancement appears to be more accurate than plain CT, as it emphasizes the epidural space and its abnormalities. In our institution this has become the primary diagnostic procedure in cases of suspected cervical disk disease. It may eliminate the need for more invasive procedures. Several patients have undergone surgery on the basis of this examination alone, after neurologic and neurophysiologic evaluation.

Nevertheless in some cases an accurate diagnosis of cervical soft disk herniation is difficult to obtain by contrast-enhanced CT alone: patient obesity or motion artifacts may result in poor quality scans with reduced diagnostic value. Myelography may be performed in such cases, but this examination has also been difficult to perform. CT metrizamide myelography may prove to be the only valuable diagnostic procedure in some cases (fig. 4).

In summary, CT with intravenous contrast enhancement should

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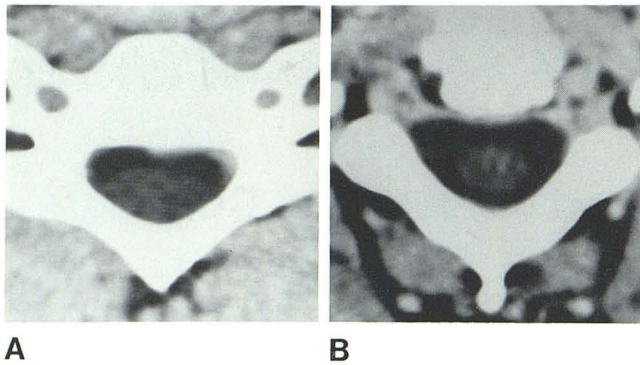


Fig. 1.—CT of normal cervical spine after intravenous contrast enhancement. Epidural space clearly visualized, both behind vertebral body (A) and at level of disk (B).

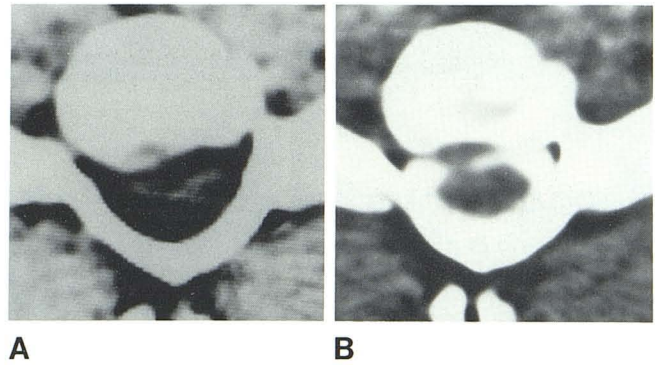


Fig. 4.—Left soft disk herniation at C5-C6. Suspected diagnosis by contrast-enhanced CT (A) is confirmed by CT metrizamide myelography (B).

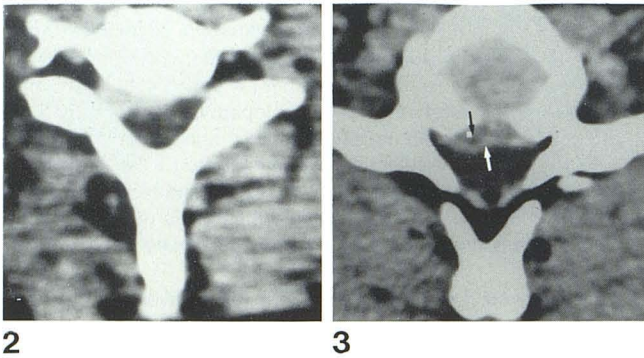


Fig. 2.—Contrast-enhanced CT. Left lateral cervical soft disk herniation at C6-C7 (surgically confirmed).

Fig. 3.—Contrast-enhanced CT. Central cervical soft disk herniation. Displaced epidural layer (white arrow) is enhanced. Adjacent herniated disk material (black arrow) appears hypodense.

be the first diagnostic procedure performed when cervical soft disk herniation is suspected. If this fails to provide a diagnosis, computer-assisted myelography should be the next choice, as it appears to have greater diagnostic usefulness than conventional myelography [8, 9].

REFERENCES

1. Stookey B. Compression of spinal cord and nerve roots by herniation of nucleus pulposus in cervical region. *AMA Arch Surg* 1940;40:417-432
2. Spurling RG. *Lesions of the cervical intervertebral disk*. Springfield, IL: Thomas, 1956
3. Lunsford LD, Bissonette DJ, Jannetta PJ, Sheptak PE, Zorub DS. Anterior surgery for cervical disc disease. *J Neurosurg* 1980;53:1-11
4. Wackenheim A, Dupuis M, Dosch JC. Un signe indirect de hernie discale cervicale. *J Radiol* 1980;61:43-47
5. Shapiro R. The herniated intervertebral disk. In: Shapiro R, ed. *Myelography*, 2d ed. Chicago: Year Book, 1968:353-368
6. Massare C, Bard M, Tristant H. Discographie cervicale. *J Radiol* 1974;55:395-399
7. Coin CG, Coin JT. Computed tomography of cervical disk disease: technical considerations with representative case reports. *J Comput Assist Tomogr* 1981;5:275-280
8. Coin CG, Chan YS, Keranen V, Pennink M. Computer assisted myelography in disk disease. *J Comput Assist Tomogr* 1977;1:398-404
9. Lee BCP, Kazam E, Newman AD. Computerized tomography of the spine and spinal cord. *Radiology* 1978;128:95-102