

**Discrimination of Intervertebral Disk Extrusion from Protrusion with MR Imaging****Jee-Young Kim, MD<sup>1</sup> · Won-Hee Jee, MD<sup>1</sup> · Kee-Yong Ha, MD<sup>2</sup> ·****Chun-Kun Park, MD<sup>3</sup> · So-Hee Cho, MD · Jae-Young Byun, MD**<sup>1</sup>Departments of Radiology, <sup>2</sup>Orthopedic Surgery, and <sup>3</sup>Neurosurgery,

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**목적** : To determine the accuracy of magnetic resonance (MR) imaging for discrimination between intervertebral disk extrusion versus protrusion.

**대상 및 방법** : MR images of 80 patients who had MR imaging of the spine and confirmed as intervertebral disk extrusion or protrusion were retrospectively reviewed by an experienced musculoskeletal radiologist. A 1.5-T scanner was used. After review of medical records, MR findings of disk extrusion and protrusion were compared using the chi-square test. Intraobserver agreement for differentiation of disk extrusion from protrusion was calculated by using kappa coefficient.

**결과** : At surgery, there were 48 intervertebral disk extrusion and 32 protrusion. The reviewer identified intervertebral disk extrusion with mean sensitivity, specificity, and accuracy in 77%, 81%, and 79%, respectively, whereas protrusion in 82%, 77%, and 79%, respectively. Intraobserver agreement for the differentiation of disk extrusion from protrusion was substantial ( $\kappa = 0.68, P < .0001$ ). MR findings suggestive of intervertebral disk extrusion were as follows ( $P < .05$ ): a lobulated or irregular contour of the herniated disk on axial MR images (71% in extrusion versus 22% in protrusion); disruption of outer annular fibers on sagittal T2-weighted images (71% versus 19%) or sagittal T1-weighted images (71% versus 44%). The mean ratio of anteroposterior dimension to transverse dimension was 0.70 for extruded disk and 0.42 for protruded disk. There was a significant correlation between the ratio of anteroposterior to transverse dimension and the differentiation of disk extrusion from protrusion ( $r = .52, P < .0001$ , Spearmans correlation).

**결론** : MR imaging was accurate for differentiation of intervertebral disk extrusion from protrusion. Disruption of outer annular fibers, a lobulated or irregular contour, and increased ratio of anteroposterior dimension to transverse dimension were suggestive of intervertebral disk extrusion.