Diagnostic Efficacy of Myelo-CT for Surgical Confirmation in Degenerative Lumbar Spine Diseases; Comparison with MRI
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Purpose: Since MRI was introduced in clinical practice, the diagnostic usefulness of myelo-CT has been overlooked. In the present retrospective study, the authors tried to elucidate diagnostic value of myelo-CT compared to that of MRI in a patient, who had clinically significant radiculopathy and needed a surgical management.

Methods: The study included retrospectively 100 consecutive patients in an average age of 58 years (range 20-81 years) presenting with intractable unilateral radicular leg pain caused by degenerative lumbar spinal disease between March and September 2010. The authors performed preoperative MRI and CT-myelography concurrently, and confirmed a nerve root compromise by the disc or stenosis during operation in all cases. The root shadows on preoperative MRI (T2 axial images) and CT-myelography (axial scans) of symptomatic side at the pathologic level were classified into four grades: Grade 0: no root compression (root shadow is well visualized), Grade 1: nerve root is just abutted or contacted, Grade 2: nerve root is displaced by compression, Grade 3: definite root compression and completely non-visualized (flattened or obliterated) root shadow. The results of each imaging modality were compared and assessed by two different observers in relation to the grades, and the inter-observer difference was also assessed.

Results: The study included 165 individual nerve roots. Diagnoses were 49 cases of herniated disc, 39 of lateral recess stenosis caused by hypertrophied facet joints, 10 of spondylolisthesis and 2 of foraminal stenosis. The main offending lesions observed during the operation were herniated disc in 49 cases, facet or ligamentum flavum in 48, and combined in 3. The distribution of the grade observed on MRI was 1.2% of Grade 0; 27.2% of Grade 1; 26.6% of Grade 2; 44.8% of Grade 3. Meanwhile, the distribution of the grade observed on myelo-CT was 1.2% of Grade 0; 13.3% of Grade 1; 26.6% of Grade 2, and 58.7% of Grade 3. In comparison study between two diagnostic procedures, the cases, in which an identical patient has different grade in either myelo-CT or MRI, account for 29%, and this difference was statistically different (P< 0.05). And it was observed that 2/3 of patients in Grade 1 on MRI demonstrated higher grades on myelo-CT, whereas only less than 1/10 of the patients in Grade 1 on myelo-CT revealed higher grades on MRI; 39% of the patient in Grade 2 on MRI demonstrated Grade 3 on myelo-CT, whereas 10% of patient in Grade 2 on myelo-CT revealed Grade 3 on MRI (P< 0.001).

Myelo-CT brought about 2% of intracranial hypotension and 22% of temporary back pain, but no infection or arachnoiditis.

Conclusion: The present study demonstrates that myelo-CT would be more sensitive to define nerve root compromising lesions in the lumbar spine than MRI. Myelo-CT can be considered to be a useful supplementary study for a confirmative diagnosis when MRI study does not provide enough information in a patient with lumbar radiculopathy.