

Vertebral Body MRI Related to Lumbar Fusion Results

Author: Glenn R. Buttermann M.D., M.S., F.A.A.O.S

Abstract

The evaluation of continued pain after a technically successful posterolateral lumbar spine fusion is often challenging. Although the intervertebral disc is often a source of low back pain, abnormal endplates may also be a focus of pain, and possibly a source of continued pain after a posterolateral fusion. MRI allows noninvasive evaluation for disc degeneration, as well as for abnormal endplates and adjacent vertebral body marrow. Previous studies have found inflammatory marrow changes, adjacent to abnormal endplates, associated with disc degeneration in low back pain patients. In this study, preoperative MRI scans in 89 posterolateral lumbar fusion patients were reviewed, by an independent radiologist, to determine whether vertebral body marrow changes adjacent to the endplates were related to continued pain. Independent chart review and follow-up telephone interview of all patients at a 4-year follow-up (mean) formed the basis for the clinical results. Vertebral body MRI signals consistent with inflammatory or fatty changes were found in 38% of patients, and always occurred adjacent to a degenerated disc. Inflammatory MRI vertebral body changes were significantly related to continued low back pain at $P = 0.03$. We conclude that posterolateral lumbar fusion has a less predictable result for the subset of degenerative disc patients with abnormal endplates and associated marrow inflammation. More research is needed to determine the biological and biomechanical effects of a posterolateral fusion upon the endplate within the fused segments. If indeed further study supports the hypothesis that abnormal endplates associated with inflammation are a source of pain, then treating the endplates directly by anterior fusion may be a preferred treatment for this subset of degenerative patients.