

Degenerative Conditions of the Lumbar Spine Treated with Intervertebral Titanium Cages and Posterior Instrumentation for Circumferential Fusion

Thomas S. Whitecloud III, Frank P. Castro, Jr., *Mark R. Brinker, Charles W. Hartzog, Jr., James E. Ricciardi, and Cherie Hill

Department of Orthopaedic Surgery, Tulane University School of Medicine, New Orleans, Louisiana; and
**Fondren Orthopedic Group L.L.P., Texas Orthopedic Hospital, Houston, Texas, U.S.A.*

Summary: Thirty-five consecutive patients were evaluated at an average follow-up time of 20 months after circumferential lumbar spinal fusion. All patients had degenerative conditions of the lumbar spine and same-day anterior spinal fusion by using titanium cages packed with autograft bone and posterior instrumentation combined with a posterolateral autogenous bone graft. The purpose of this study was to determine whether anterior titanium cage placement and posterior instrumentation with autologous bone graft was a safe and efficacious procedure in patients with degenerative disease of the lumbar spine. Fusion rates, complications, pain relief, medication use, and work status were specifically analyzed. Although previous reports documented the use of this technique for trauma and tumor cases, few studies assessed clinical and radiographic results in patients with degenerative conditions of the lumbar spine. Plain radiographs were used to determine spinal fusion at each spinal level. All patients were administered preoperative and postoperative questionnaires regarding three specific clinical-outcome parameters. These consisted of pain level, medication use, and work status. Intraoperative and postoperative complications were also documented. Radiographic results showed that 61 (97%) of 63 lumbar levels undergoing an arthrodesis procedure fused either anteriorly, posteriorly, or both. Of the 35 patients in this series, 33 (94%) fused at all levels, and two did not. Substantial pain relief was reported in 46% of all patients. Thirteen (37%) patients had one or more surgical complications. Circumferential spinal fusion in patients with degenerative etiologies yields excellent radiographic fusion rates and good pain relief. The procedure is technically demanding and is associated with a high rate of complications. **Key Words:** Titanium cage—Combined anterior and posterior spinal fusion—Degenerative spinal conditions—Lumbar spine.

Although posterior and posterolateral spinal fusion is considered the standard treatment for progressive spinal deformities and certain degenerative conditions, circumferential fusion of the lumbar spine remains controversial.

Posterolateral lumbar fusions yielded good results for single-level operations. However, multiple-level operations and revision surgeries resulted in pseudarthrosis rates as high as 25–50% (9,16). Posterior instrumentation reduced this problem by increasing spinal rigidity during graft incorporation and improved the rate of fusion (17,21,28,41). Pedicle-based segmental instrumentation systems were shown to increase the stiffness of posterior constructs when compared with sublaminar-based systems under axial, tor-

Received December 16, 1998; accepted April 28, 1998.

Address correspondence and reprint requests to Dr. T. S. Whitecloud III, Tulane University School of Medicine, 1430 Tulane Avenue, SL-32, New Orleans, LA 70112, U.S.A.