ACDF with Cylinder Type Cage Compared to Box Cage and Allograft Bone

Douglas B. Moreland, MD (Buffalo, NY)
Paul K. Maurer, MD (Rochester, NY)
Gregory J. Castiglia, MD
Jeffrey Lewis, MD
James G. Egnatchik, MD
Gregory Czajka, PA (Buffalo, NY)

INTRODUCTION

There are now many choices of implants to use when performing anterior discectomy and fusion (ACDF). We evaluated a new cylinder type cage (C-Pod, Theken Surgical, Akron, Ohio) as a stand-alone device in patients undergoing ACDF. We compare the complications, rate of fusion, rate of subsidence, operative time, and techniques in a prospective fashion to our experience with box type cage and allograft bone.

METHODS

Three neurosurgeons (DBM, PKM, GJC) placed 44 C-Pod cages in 33 patients consecutively treated for symptomatic cervical disc herniation. Operative records were reviewed for OR time, blood loss, and complications. Patients were evaluated with plain radiographs at 3 weeks and 3 months to evaluate migration, subsidence, and fusion rates. If there was a question of fusion either clinically or radiographically, a CT scan was obtained. These were interpreted by an independent radiologist. Most procedures were done on an outpatient or 23 hour stay basis. This data was compared to our historical prospective data with box cage (43 patients) and allograft (66).

RESULTS

There were no operative complications. Operative time was 65 minutes and blood loss averaged 25ccs. Fusion rate is 91% (40/44) at 3 months. Subsidence of greater than 2mm was noted in 9% (4/44) and is of no clinical significance. The operative time, blood loss and complications are similar to our control groups (box cage, allograft bone). We saw slightly higher fusion rates (91% versus 84%) and less subsidence (9% versus 16%) in the cylinder style (C-Pod) at three months than in the control groups.

CONCLUSIONS

The inter-body cylinder cage design represents a safe and effective alternative to autograft, allograft, as well as other types of interbody cages. The cage is designed to approximate cortical bone in structural stiffness and reduce the possibility of stress-shielding. The cylinder design allows more graft material to be packed than box or screw type designs. Biomechanical studies have shown the cylinder design to offer the most stiffness of the three. In theory this should hasten fusion. Our preliminary results support this concept. It is very easy and simple to master the technique and those advantages are conspicuous. Disadvantages include difficulty with radiographic assessment of fusion. Progress in terms of cage design and opacity may improve its utility.

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