**Poster #5 2004**

**Static Versus Dynamic Plating for Multilevel Anterior Cervical Discectomy and Fusion: Does it Matter?**

Christian M. DuBois, MD, Patrick M. Bolt, MD, Andrew M. Todd, MD, Purnendu Gupta, MD (Chicago, IL), F. Todd Wetzel, MD (Philadelphia, PA), Frank M. Phillips, MD (Chicago, IL)

(*)

**INTRODUCTION:** Anterior plate fixation is frequently used after anterior arthrodesis. Although good results with few complications have been reported with plates across a single level, less consistent results have been reported with plates spanning multiple disc levels. Recently, dynamic plates that allow for controlled settling across the construct have been popularized to allow for loading of the graft to promote fusion. To date these proposed benefits have been largely theoretical and there are no studies confirming any benefits over more traditional static plates. To our knowledge, there are no reports comparing the two plating techniques in the same clinical study. We present the radiographic and clinical outcomes of a series of 52 patients undergoing 2 or 3 level anterior cervical discectomy and fusion (ACDF) utilizing either static or dynamic plating techniques.

**METHODS:** From 1997 to 2002, 52 patients underwent 2 or 3 level ACDF with either static or dynamic plate fixation. All surgeries were performed for either radiculopathy or myelopathy by one of the two senior authors. Exclusion criteria included corpectomy or revision surgery. The Orion statically locked plating system was used in 21 patients and the Atlantis dynamic plating system was used in 31 patients. There were 40 two-level and 12 three level fusions performed. Allograft was used in 54% and autologous iliac crest was used in 46% of cases. Fusion status was assessed by 2 independent observers using lateral radiographs (83% inter-observer agreement) and a three point grading system. Functional outcome was determined through chart review using Odom criteria at the most recent follow-up. Plate migration, settling, and adjacent-level disc space impingement was evaluated using multiple measurements from lateral radiographs at 0, 3, 6, 12, months. All radiographic measures were standardized by using the plate’s known dimensions.

**RESULTS:** There were no significant differences between the static and the dynamically plated groups when assessed for the number of levels, graft type, gender, patient smoking history, workman’s compensation, or litigation status (all p >0.05). Functional outcome ratings were similar between the groups (p=0.389) and good or excellent results were seen in 84% in both groups. There were 1 and 5 patients with radiographic non-union in the statically and
dynamically plated groups, respectively (p=0.05). Of the 5 dynamic plate non-unions, 3 were two-level fusions, 4 utilized allograft, and one patient was a smoker. At 12 months, total settling of the arthrodesis construct was 1.3mm and 1.8 mm in the statically and dynamically plated groups respectively (p=0.190). Settling of the construct, resulting in relative plate migration towards the adjacent disc space was similar between the groups at 1 month, 6 months, and final follow-up (all p>0.05). Most settling occurred in the first post-operative month in both groups. Plates contacting the superior adjacent mobile disc space were found in 7 patients in the dynamic group and 2 in the static group. In 5 of 9 instances, this followed intra-operative instrumentation placement in close proximity (< 3mm) of the adjacent level disc space.

CONCLUSIONS: This study failed to show any advantage of a dynamic plate over static plating after 2 or 3 level ACDF. We did observe a statistically higher rate of non-union with dynamic plating when compared to static plating. Settling of the construct occurred within the first month of surgery and was not affected by plate design. Adjacent mobile disc impingement by the plate was found to be related to initial instrumentation placement rather than the type of plate used. Clinical outcome was similar between the groups. This study does not support the use of a dynamic plate over a simpler, less expensive static plate to stabilize multi-level ACDF.

If noted, the author indicates something of value received. The codes are identified as: a- research or institutional support; b- miscellaneous funding; c- royalties; d- stock options; e- consultant or employee; n- no conflicts disclosed, and * disclosure not available at the time of printing. For full information, refer to inside of back cover.