Temporal Trends of Recovery and Return to Activity in Single- and Multi-Level Anterior Cervical Discectomy and Fusion: Comparing Patients with Radiculopathy-Only versus Myelopathy/Myeloradiculopathy

Jung Kee Mok, Eric Rong Zhao, Austin Camron Kaidi, Atahan Durbas, Sereen A. Halayqeh, Tomoyuki Asada, Sheeraz Qureshi, Sravisht Iyer

INTRODUCTION: There is currently a paucity of literature investigating the recovery timelines following anterior cervical discectomy and fusion (ACDF); while existing studies compare patient reported outcomes (PROMs) at specific postoperative follow-up timepoints with preoperative baseline, no studies to date have investigated the rate of postoperative improvement between consecutive postoperative follow-ups, which helps answer key patient questions such as “how quickly will improvements occur?”, and “when will improvements plateau?”. Furthermore, patients with radiculopathy-only versus patients with myelopathy/myeloradiculopathy may have different postoperative recovery timelines. The purpose of this study was to elucidate the temporal trends of postoperative recovery (in terms of pain, functionality, and return to activities) following single and multi-level ACDF. We further compared recovery rates between patients with radiculopathy-only and patients with myelopathy/myeloradiculopathy.

METHODS: Patients who underwent primary single- and multi-level ACDF with minimum 1-year follow-up were included. Outcomes included PROMs such as neck disability index (NDI), visual analog scale (VAS) for neck and arm pain, and 12-item Short-Form survey for physical function (SF12-PCS). We further analyzed minimal clinically important difference (MCID) for PROMs, global rating of change (GRC), and return to activities. Improvement trends were graphed, and a vertical line indicates a “plateau” where the respective time point does not have a statistically significant difference with the following time point on Wilcoxon signed-rank or Fisher exact tests. Return to activities included whether the patient accomplished the following after surgery, as well as the number of days it took to: return to work; return to driving; discontinuation of opioids.

RESULTS: 616 patients (232 radiculopathy-only; 384 myelopathy) were included. The myelopathy cohort was significantly older, had a higher BMI, higher average Charlson comorbidity index, and longer hospital length of stay. For both single and multi-level ACDFs, VAS neck and arm tended to plateau within 6 weeks postoperative (Figures 3b, 4a, 4b), while NDI and SF12-PCS tended to plateau within 12 weeks to 6 months (Figures 1b, 2a, 2b). Comparing radiculopathy-only versus myelopathy, patients with myelopathy-only tended to have later plateaus in SF12-PCS (Figures 2a, 2b), VAS neck (Figures 3a, 3b), and VAS arm (Figure 4b). Patients with radiculopathy-only also had higher rates of GRC improvement at 12 weeks and 1 year.

DISCUSSION AND CONCLUSION: After primary ACDF, the majority of improvements in neck and arm pain tend to occur within 6 weeks postoperative, while improvements in functionality (e.g. NDI, SF12-PCS) can continue to occur even through 6 months postoperative. Patients with myelopathy/myeloradiculopathy tend to experience later plateaus in improvement compared to patients with radiculopathy-only.