

Title: When to Initiate Post-Operative Physical Therapy in Multilevel Posterior Cervical-Thoracic Fusions?

Background: The role of Physical Therapy (PT) in patients undergoing surgery for cervical spondylotic myelopathy is understudied and not well understood

Research Question: When should neck strengthening exercise be initiated after multilevel posterior cervical-thoracic fusions

Design: Retrospective study

Methods: Chart reviews were conducted on patients who underwent a ≥ 3 level posterior cervico-thoracic fusion with caudal levels as C7 and T1/T2. Prescription and completion of physical therapy (PT) were study inclusion criteria

Results: 105 patients were included in the study and were divided into two cohorts: those that initiated PT ≤ 6 weeks post-op and those who initiated PT > 6 weeks post-op. 58 patients were included in the Early PT cohort, and 47 were included in the Late PT cohort. Demographically, the Early PT and Late PT cohorts were similar in age (62.8 vs 61.1 years) and predominantly female (64.5% vs. 67.6%). No significant difference was reported between the groups in body mass index, with a mean of 30.7 for Early PT and 31.2 for Late PT. While both cohorts showed improvement in radiographic parameters and patient reported outcomes at 2 years post-op, there were significant differences in level of improvement between the two groups. The Early PT group had a comparatively better % improvement (2wk vs. 2 years postop) in cervical lordosis (25.2% vs 14.2%); mean T1 slope (-5.6% vs. -2.6%); and mean C2-C7 sagittal plumbline (-15.2% vs -11.7%). Patients who started PT ≤ 6 weeks post-op also reported greater visual

analog scale % improvement 61.9% vs 41% and oswestry disability index % improvement 46.3% vs. 29.6% at 2 years post-op

Discussion: Patients who underwent a three or more-level posterior cervico-thoracic fusion and started PT at or before 6 weeks post-op exhibited greater radiographic and patient reported outcomes benefits than those starting PT more than 6 weeks post-op. The results of this study support the early initiation of neck strengthening PT in most uncomplicated post-cervical fusion adult patients.