

**Anterior versus Posterior Approaches for Odontoid Fracture Stabilization in Patients Older Than 65 Years: 30-Day Morbidity and Mortality***Joseph Patterson, MD<sup>1</sup>; David Sing, BS<sup>2</sup>; Bobby Tay, MD<sup>2</sup>; Alexander Theologis, MD<sup>1</sup>*<sup>1</sup>*University of California San Francisco, San Francisco, California, USA;*<sup>2</sup>*University of California San Francisco Orthopaedic Surgery, San Francisco, California, USA*

**Background/Purpose:** Surgical stabilization of odontoid fractures is superior to nonoperative management in geriatric patients. How elderly patients with odontoid fractures fare after anterior and posterior approaches, however, is not well defined. The purpose of this study is to compare 30-day perioperative clinical outcomes of surgical odontoid stabilization by an anterior or posterior operative approach in elderly patients.

**Methods:** Retrospective review of the prospectively collected American College of Surgeons National Surgical Quality Improvement Program (ACS-NSQIP) database (2005-2013). Elderly patients (greater than 65 years) with odontoid fractures who underwent odontoid stabilization via anterior or posterior approaches were identified by ICD-9/CPT codes. Exclusion criteria included concomitant subaxial spine surgery, instrumentation noncontiguous with the atlantoaxial interval, and combined approaches. Baseline demographics and perioperative details were compared. Adverse events, mortality, reoperation, discharge, and readmission rates within 30 days of operation were compared using bivariate and multivariate generalized linear regressions.

**Results:** 141 patients (male 81, female 60; average age:  $77.8 \pm 6.5$  years; anterior approach 48, posterior approach 93) were analyzed. Patients scheduled to have a posterior approach had significantly more nonunions preoperatively and higher body mass index (BMI). Operative times for posterior surgeries were significantly longer. Age, comorbidities, functional dependence, time to surgery, and length of hospital stay were similar between groups. There were no significant differences in the relative risk (RR) of the composite outcome of "any adverse event" after adjusting for differences in baseline characteristics. Patients who underwent an anterior approach were more likely to have an unplanned hospital readmission (RR = 8.95, 95% CI 2.21-36.29,  $P = 0.002$ ) and have significantly more revision operations (RR = 19.51, 95% CI 2.49-152.62,  $P = 0.005$ ) than patients who had a posterior operation.

**Conclusion:** An anterior approach for odontoid fracture stabilization in patients  $\geq 65$  years old is associated with shorter operative times and greater relative risks of unplanned readmissions and revision operations within 30 days of surgery relative to a posterior approach.