Do PEEK Rods for Posterior Instrumented Fusion in the Lumbar Spine Reduce the Risk of Adjacent Segment Disease?

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Disclosure

- No disclosures
Introduction

- Polyetheretherketone (PEEK) rods were clinically introduced in the mid-2000s as an alternative to titanium (Ti) rods for posterior instrumented lumbar spine fusion

- Theorized to reduce the risk of adjacent segment disease (ASD)

**Purpose:** We sought to evaluate the association between utilization of the two rod systems and risk for postoperative outcomes
Methods

- **Study Design:** Matched cohort study, level III evidence

- **Data Source:** Kaiser Permanente Spine Registry

- **Study Sample:** Patients aged ≥18 years undergoing first posterior lumbar fusion for a degenerative diagnosis from 2009-2018 using either a PEEK or Ti rod
  - Final matched sample included 154 PEEK and 308 Ti fusions
Methods

▪ Longitudinal outcomes
  • Reoperation for ASD
  • Reoperation for non-union

▪ 90-day binary outcomes
  • Emergency department (ED) visit
  • Readmission
  • Complication – including deep infection, deep vein thrombosis, pulmonary embolism
Statistical Analysis

- Fusions using Ti rods were 2:1 propensity score-matched to PEEK rods on the following factors:
  - Patient age, body mass index, American Society of Anesthesiologists classification, smoking status, diagnosis, interbody use, bone morphogenic protein use, fusion levels, number of levels fused, and operative year

- Cox regression to evaluate longitudinal outcomes

- Logistic regression to evaluate 90-day outcomes
**Results**

- No difference observed in risk for ASD (HR=1.02, 95% CI=0.66-1.59)
Results

▪ A lower likelihood of readmission (OR=0.34, 95% CI=0.13-0.94) was observed following PEEK fusion

▪ No difference observed in likelihood for ED visit (OR=0.88, 95% CI=0.48-1.59)

▪ No non-unions or 90-day complications were observed in the PEEK group

▪ 5 (2-year cumulative incidence=0.7%) non-unions and 4 (1.3%) complications observed in the Ti group
Summary Points

- Our study did not support the hypothesis that PEEK rods are associated with a difference in ASD risk

- Reasons for readmission need to be identified to better understand the observed difference

- Further study of patients with TLIF using Ti and PEEK rods and posterolateral fusion with Ti and PEEK rods is needed