Surgical Site Infections After the Transoral versus Posterior Approaches to Atlantoaxial Fusions: A Matched Cohort Study

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Introduction

In the past, spine surgeons have evaded the transoral approach to the atlantoaxial segment for concerns of unacceptable patient morbidity. The objective of this study is to measure 30-day postoperative complications, especially surgical site infections (SSI), after the transoral [Figure 1] versus posterior approach [Figure 2] to atlantoaxial fusions.

Methods

The source population was provided by the American College of Surgeons National Surgical Quality Improvement Program database, which was queried for all patients who underwent atlantoaxial fusion for degenerative/spondylotic disease and/or trauma between 2005 and 2014 [Figure 3].

Methods (Continued)

In order to eliminate a bias of unequal sample sizes, the transoral approach was matched with the posterior approach (generally 1:5 ratio) based on age ± 5 years and modified frailty index score (a measure of preoperative comorbidity burden). Because the rare SSI incidence, adjusted odds ratios (ORadj) of SSI were calculated with a Penalized Maximum Likelihood Estimation.

Figure 1

Anterior C1-C2 fusion construct (Permission for figure adaptation received from Wiley Publishers. Originally published by Yin et al.: Transoral Transoral atlantoaxial reduction plate internal fixation for the treatment of irreducible atlantoaxial dislocation: a 2- to 4-year follow-up. Orthopaedic Surg 2:149-155, 2010)

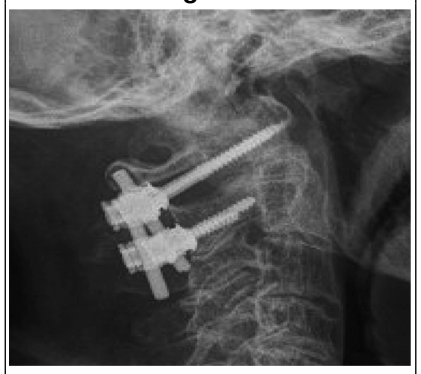
Results

Results: Of the 318 patients included, the transoral cohort (N=56) compared with the posterior cohort (N=262) did not significantly differ in the 30-day postoperative individual complications, including SSI (1.79% vs 1.91%, p=0.951), as well as composite complications (10.71% vs 6.87%, p=0.323). Controlling for sex and smoking, the odds of SSI in the transoral approach was almost equal to the odds in the posterior approach (OR=1.17, p=0.866). While the unplanned reoperation rate of 5.36% after transoral surgery was higher than the 1.53% after posterior surgery, the difference was not statistically significant (p=0.076).

Conclusions

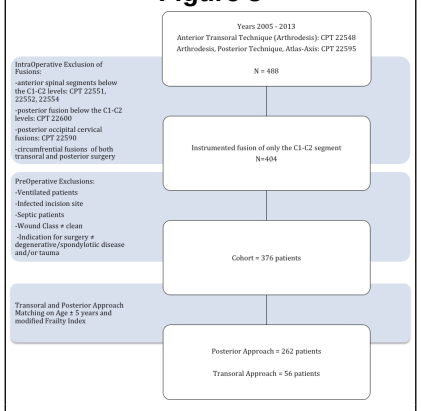
Transoral versus posterior surgery for atlantoaxial fusions did not differ in 30-day unexpected outcomes. Therefore, spinal pathology, rather than concern for postoperative complications, should adjudicate the technical approach to the atlantoaxial segment.

Figure 2



Posterior instrumented fusion of the C1-C2 junction.

Figure 3



Selection Criteria for study population

Learning Objectives

By the conclusion of this session, participants should be able to:

1) Understand differences in surgical site infection in the anterior versus posterior approaches to the C1-C2 segment

2) List a few reasons for the similarity in surgical site infection between the anterior versus posterior approaches to the C1-C2 segment