Most Common Neurosurgical Procedures & Complications: A NSQIP Analysis

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Introduction

The American College of Surgeons National Surgical Quality Improvement Program (NSQIP) maintains a large, randomized dataset with up to 30-day post-operative complications. The extensive neurosurgical records contained in this dataset allowed us to identify the most commonly reported neurosurgical procedures and post-operative complications.

Methods

We performed a search of the NSQIP database from 2006 to 2014 for patients who underwent an operation with a surgeon whose primary specialty was neurosurgery. We determined the five most frequently reported procedures and performed univariate, bivariate, and multivariate analysis of demographics, past medical history, and post-operative complications for these procedures.

Results

The five most commonly reported neurosurgical procedures in the NSQIP database from 2006 to 2014 were anterior cervical discectomy and fusion (ACDF), craniotomy for brain tumor (CBT), discectomy, laminectomy, and posterolateral lumbar fusion (PLF). The most common complications overall were bleeding required transfusion (BRT) (3.90%), urinary tract infection (UTI) (1.32%), deep vein thrombosis (DVT) (0.79%), superficial surgical site infection (SSSI) (0.78%), sepsis (0.71%) and pneumonia (0.66%). The most common complications for ACDF were pneumonia (0.70%), UTI (0.64%), unplanned intubation (0.56%), BRT (0.40%) and SSSI (0.36%). The most common complications for CBT were BRT (4.63%), DVT (2.50%), UTI (2.36%), unplanned intubation (1.94%), and ventilator dependence greater than 48 hours (1.65%) and for discectomy were BRT (3.35%), UTI (1.12%), sepsis (1.02%), SSSI (0.82%), and deep incisional surgical site infection (DSSI) (0.64%). The most common complications for laminectomy were BRT (2.32%), UTI (1.10%), SSRI (0.93%), DSSI (0.58%), and sepsis (0.54) and for PLF were BRT (12.46%), UTI (1.80%), SSSI (1.11%). DVT (0.78%), and DSSI (0.77%).

Conclusions

The analysis of complication rates after common neurosurgical procedures may help drive quality improvement efforts, and the large number of neurosurgical cases reported in the NSQIP dataset provides a strong evidence base that could drive a reduction in morbidity, mortality, and post-operative complications after neurosurgery by allowing for the identification and proper management of patients at a high pre-operative risk for complication.

Learning Objectives

By the conclusion of this session, participants should be able to:
1.) Identify the most common neurosurgical procedures and post-operative complications
2.) Discuss how to best reduce these complications (ex. surgical checklist implementation)