Risk Factors For Surgical Site Infections After Spinal Neurosurgery: An Analysis of 9,705 Cases over 8 years

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Learning Objectives

by the conclusion of this session, participants should be able to identify modifiable and non-modifiable risk factors for surgical site infections in spine surgery.

Introduction

Surgical site infection (SSI) can be a significant cause of patient morbidity and mortality after spine surgery. Chlorhexidine has been found in large analyses to provide superior infection prevention than traditional iodine-based scrub solutions. We sought to analyze the association with postoperative infection of various known risk factors as well as the use of chlorhexidine-based high-alcohol scrub solutions.

Methods

We analyzed administrative data (2003-2010) for patients undergoing spinal neurosurgery at two university-associated hospitals. Patients who were readmitted with a diagnosis of infection or who underwent surgical re-exploration for infection were identified. Control patients were randomly identified, matched for index operation CPT code and by year. Chart review was performed for cases and controls. Logistic regression was used to perform univariate and multivariate analysis to identify risk factors associated with SSI.

Results

9,705 spinal neurosurgery cases were performed and 179 infections were identified (1.8%). Within the administrative dataset, multivariate analysis found cervical level (OR 0.6, 95% CI 0.4-0.96, p=0.03) and degenerative diagnosis (OR 0.3, 95% CI: 0.2 – 0.4, p<0.0001) were associated with reduced SSI risk; vascular diagnosis (OR 4.4, 95% CI: 1.2 – 15.8, p=0.02) and posterior approach (OR 2.9, 95% CI: 1.4 – 6.0, p=0.003) were associated with increased risk. Redo surgery and instrumentation were not associated with SSI risk.

Comparing cases and controls (n=179 in each group, matched on procedure subtype) diabetes, number of spinal levels, and index length of stay were associated with increased SSI risk in univariate analysis. Age, gender, patient smoking, obesity, month, high-alcohol prep solution, operative time, use of surgical drain, and durotomy were not associated with SSI risk. On multivariate analysis only diabetes (OR 3.0, 95% CI: 1.7 – 5.3, p<0.0001) and index length of stay (OR 1.06, 95% CI: 1.02 – 1.11) were associated with increased risk of SSI.

Conclusions

Though SSI risk varied by surgery type, the controllable risks for SSI after spinal surgery in our analysis were posterior approach, diabetes, and length of stay. Even adjusting for other factors, use of high alcohol prep (e.g. chloraprep) was not associated with reduced SSI rates.

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