Surgical site infection in spine surgery

- Surgical Outcomes of Single-Stage Correction Using Cervical Pedicle Screw Fixation Rather Than Lateral Mass Fixation in NF1-Associated Pediatric Cervical Kyphosis: A Retrospective Study with a Minimum 2-Year Follow-Up
- Vancomycin Antibiotic Prophylaxis Compared to Cefazolin Increases Risk of Surgical Site Infection Following Spine Surgery
- Vancomycin powder mixed with autogenous bone graft and bone substitute may decrease the deep surgical site infections in elective lumbar instrumented fusion surgery for degenerative disorders: A prospective randomized study
- Does Intraoperative Antiseptic Solution Soaking Reduce Microbial Contamination in Spine Surgery? A Randomized Controlled Trial
- Prediction of postoperative SSIs and causative organisms in the spine by measuring trophic factors using preoperative serum markers
- Predictive value of the preoperative C-reactive protein-to-albumin ratio for surgical site infection after percutaneous kyphoplasty: a single-center retrospective study
- Assessing the Effectiveness of Antibiotic Irrigation to Reduce Bacterial Load at the Spinal Surgical Site: An In-Vitro Study
- Device Evaluation, Treatment, and Explantation Recommendations (DETER): Review and Best Practices for Managing Neuromodulation Device Infections

see Spinal infection.

see also Spinal instrumentation infection.

Surgical site infections (SSI) are common spine surgery complications.

Most descriptions of spine surgery morbidity and mortality in the literature are retrospective. Emerging prospective analyses of adverse events (AEs) demonstrate significantly higher rates, suggesting underreporting in retrospective and prospective studies that do not include AEs as a targeted outcome.

Major spinal surgery in adult patients is often associated with significant intraoperative blood loss.

In spine surgery, the incidence of postoperative wound infection is 0.7 to 16% [1) 2)].

Although incidence rates are low, adverse events of spinal procedures substantially increase the cost of care. Charges for patients experiencing Deep venous thrombosis (Deep-vein thrombosis), PE, and surgical site infection (SSI) increased in a study by factors ranging from 1.8 to 4.3 times those for patients without such complications across 5 common spinal and orthopedic procedures. Cost projections by health care providers will need to incorporate expected costs of added care for patients experiencing such complications, assuming that the cost burden of such events continues to shift from payers to providers [3)].

Surgical site infections are a major driver of morbidity and increased costs in the postoperative period after spine surgery. Current tools for surveillance of these adverse events rely on prospective clinical tracking, manual retrospective chart review, or administrative procedural and diagnosis codes.

The purpose of a study was to develop natural language processing (NLP) algorithms for automated reporting of postoperative wound infection requiring reoperation after lumbar discectomy.

Adult patients undergoing discectomy at two academic and three community medical centers between January 1st, 2000 and July 31st, 2019 for lumbar disc herniation.

Reoperation for wound infection within 90-days after surgery METHODS: Free-text notes of patients who underwent surgery from January 1st, 2000 to December 31st, 2015 were used for algorithm training. Free-text notes of patients who underwent surgery after January 1st, 2016 were used for algorithm testing. Manual chart review was used to label which patients had reoperation for wound infection. An extreme gradient-boosting NLP algorithm was developed to detect reoperation for postoperative wound infection.

Overall, 5860 patients were included in this study and 62 (1.1%) had a reoperation for wound infection. In patients who underwent surgery after January 1st, 2016 (n = 1377), the NLP algorithm detected 15 of the 16 patients (sensitivity = 0.94) who had reoperation for infection. In comparison, current procedural terminology (CPT) and international classification of disease (ICD) codes detected 12 of these 16 patients (sensitivity = 0.75). At a threshold of 0.05, the NLP algorithm had positive predictive value of 0.83 and F1-score of 0.88.

Temporal validation of the algorithm developed in this study demonstrates a proof-of-concept application of NLP for automated reporting of adverse events after spine surgery. Adapting this methodology for other procedures and outcomes in spine and orthopaedics has the potential to dramatically improve and automatize quality and safety reporting [4].

The leading causal agent of SSI after spine operations is Staphylococcus aureus [5].

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