Implementation of an Evidence-Based Infection Prevention Protocol for Spinal Fusion Surgery: A Single-Institution, Single-Surgeon Experience with Zero Surgical Site Infection

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Introduction

- Surgical site infections (SSIs) following instrumented spinal fusion are relatively common, with an incidence of nearly 3%.

Objective

- In 2018, an evidence-based clinical protocol for infection prevention after spinal fusion surgery was implemented in our center, including preoperative, intraoperative, and postoperative measures. All posterior fusion procedures received in situ vancomycin powder before final closure.

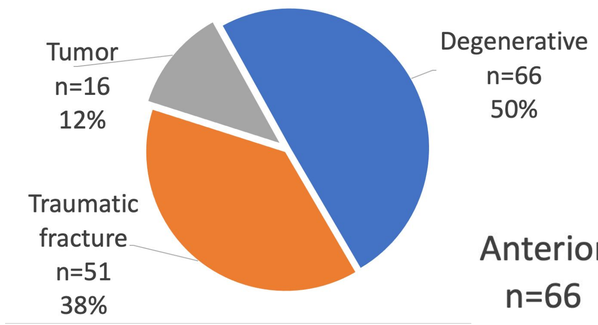
Methods

- All spinal fusion procedures performed by the senior author between January 2018 and December 2022 were identified from a prospectively maintained procedural database.
- Patients with a preexistent spinal infection were excluded.
- Medical records were retrospectively reviewed.

Table 1. Patient and operative characteristics

N, patients	133
N, fusion procedures	163
Posterior approach, n (%)	97 (60%)
Anterior approach, n (%)	66 (40%)
Men, n (%)	97 (72.9%)
Age (years), mean (range)	59 (19-90)
Operative time (minutes), median (range)	195 (76-568)
Postoperative closed-suction drain, n (%)	133 (81.6%)
Drain duration (days), median (range)	2 (1-7)
Perioperative intravenous antibiotics, n (%)	163 (100%)

Figure 1. Primary indications



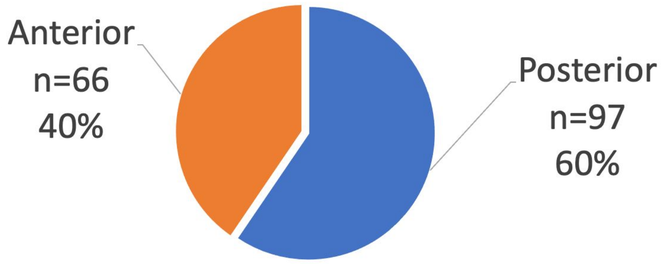


Figure 2. Surgical approaches

Results

- During the study period, 163 spinal fusion surgeries were performed on 133 patients.
- Patient and operative variables are summarized in Table 1.

- Indications for fusion were: degenerative disc disease in 66 (49.6%), traumatic fracture in 51 (38.3%), spinal tumor in 16 (12%).
- A posterior approach was used in 97, with a median number of levels fused of 4 (range 1-9).
- An anterior approach was used in 66, with a median number of levels fused of 2 (range 1-4).

- Median surgical time (skin incision-closure) was 195 minutes (mean 213, range 76-568).
- A closed suction drain was placed in 133 cases (81.6%), with a median length of stay of 2 days (range 1-7).
- All patients received IV antibiotics for 24 hours.

- After a median follow-up of 6 months (range 1-52), not a single SSI (0%) occurred in this series.
- In one patient (0.6%), an esophageal injury occurred during anterior cervical fusion, resulting in a neck abscess, which necessitated surgical drainage.

Conclusions

- Using a pragmatic, evidence-based infection prevention protocol, the rate of SSI after spinal fusion surgery can be effectively reduced to zero.