SSI Risk Reduction Techniques in Spine Surgery

Adam MacMillan; Melissa Brodsky; Aakash Agarwal PhD; Bruce M. Frankel MD

Spinal Balance Inc.

1510 N Westwood Ave.

CNS 2017 ANNUAL MEETING
BOSTON, MASSACHUSETTS
OCTOBER 7–11, 2017

Introduction

According to a prospective randomized control trial conducted by McClelland et al, the incident rate for thoracolumbar SSI can occur in the range of 2-13%, with recent findings indicating that the incident rate is around 12.7%.[1] Furthermore, a SSI is estimated to extend a patient's hospital stay from 7-19.5 days, with orthopedic SSI's requiring an average of 14 additional days of hospitalization, incurring a cost of $4500 per day.[2]

Methods

We performed a systematic review of literature to find the upcoming practices associated with SSI risk reduction in spine surgery.

Results

The new practices involved the following:

***1. Better implant handling*:** In a randomized prospective trial analyzing 105 consecutive instrumented surgical cases, implant coverage was found to significantly reduce the contamination rate ($p=0.016$).[3] A contamination rate of 2.0% (n=51) versus the 16.7% (n=59) with uncovered implants.

2. Terminally sterilized devices: In a prospective study of 49 patients, the infection rate with a terminally sterilized device was 2%. Though they lacked a control group, this rate is at the lowest end of SSI rates after spinal surgery, reported in the literature (2-12.7%).[4] Furthermore more, it was shown that within a time period of 72 hours, re-sterilized devices in hospitals had a positive bacterial growth as opposed to no bacterial growth on a terminally sterilized device.[5]

Conclusions

SSI have been deemed by CMS as not the payers' responsibility, as such the management of these complications should be borne by hospitals and health care providers.[6] The average hospitalization cost for an SSI resulting from orthopedic surgery is $63,000 per case at an average frequency of 5.5% of cases (built in cost of $3465 for every surgery).[1, 2] This has resulted in the advent of newer practices of better implant handling and the use of terminally sterilized devices.

Learning Objectives

1. The implant coverage significantly reduces contamination rate.
2. Terminally sterilized devices results in the lowest SSI rate.
3. The cleaning and sterilization at hospitals are not as effective as the rigorously validated procedure incorporated by the implant manufactures.

References

1. McClelland, S. et al. Int J Spine Surg, 2016. 10: p. 14. **2.** Whitehouse, J.D. et al. Infect Control Hosp Epidemiol, 2002. 23(4): p. 183-9. **3.** Bible, J.E. et al. The Spine Journal, 2013. 13(6): p. 637-640. **4.** Litrico, S., et al. European Journal of Orthopaedic Surgery & Traumatology, 2016. 26(1): p. 21-26. **5.** Hogg, N.J. and A.D. Morrison J Can Dent Assoc, 2005. 71(3): p. 179-82. **6.** Daniels, A.H., et al. Spine, 2016. 25(2): p. 165-169.