

***CORR* Insights®: Does Minimally Invasive Surgery Have a Lower Risk of Surgical Site Infections Compared With Open Spinal Surgery?**

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Where Are We Now?

Ee et al. present a quality case-control study investigating the risk factors for postoperative spinal infection with a special emphasis on the role of minimally invasive surgery (MIS) as a potential technique to minimize this complication [1–4, 6–8]. While many studies have investigated risk factors for spinal infection, few have included the use of open versus minimally invasive approaches as risk factors. The largest study in the literature identifying the potential benefit of MIS was a retrospective review of the Scoliosis Research Society Morbidity and Mortality database by Smith et al. [8]. However, there were many limitations of the Scoliosis Research Society study, principally related to the inherent

problems with a retrospective database query, where limited information is collected on the patients' risk factors for infection. While infection is quickly becoming categorized as a “never” event, many patient factors are not under the direct control of the surgeon. Identification of these risk factors is the first step in modifying our practices to decrease this complication.

Where Do We Need To Go?

This paper nicely addresses many of these limitations by performing a nested-case-control study in which patients were matched on the basis of type of surgery, surgeon experience, and the timing of the operation. By performing both univariate and multivariate regression analysis of potential risk factors, the authors were able to identify several risk factors for spinal infection including: open surgical approach, the presence of diabetes, increasing numbers of levels of surgery, and increased BMI. Due to the small number of cases of infection and the wide confidence intervals, these data should be viewed in perspective and may not reflect the only reasons for postoperative infection. An ideal case-control study should be large enough to offset the statistical concerns that arise from studies whose sample size is insufficient. We need studies of this sort in order to have greater confidence in the results observed here, or to refute them.

How Do We Get There?

Due to the rare nature of spinal infection, it is hard to study this topic more rigorously with single-center prospective studies; the large numbers of patients needed to have an

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adequately powered study make this essentially impossible. That being the case, well-designed case-control studies such as the one being reviewed here may be the best way to identify the risk factors for infection. However, even with more than 2,000 patients included in the analysis, we can see that there still are statistical limitations to this technique. Large multicenter prospective data collection into well-designed databases or registries may be another way to overcome the sample-size problem. It is likely that we will need tens of thousands of patients in order to achieve adequate power to analyze potential risk factors. We must also be cognizant of current and developing techniques that are becoming more widely adopted to decrease infection rates, such as local antibiotic delivery at the time of surgery [5, 9]. While this technique has demonstrated excellent short-term decrease in infection rates, there is growing concern that the routine use of these techniques result in the emergence of resistant organisms. As we continue to strive to improve patient care, and payers consider adopting reimbursement strategies that penalize caregivers for complications, we must attempt to both understand and improve our infection rates. While we may never completely eliminate this complication, a solid understanding of the risk factors is the first step in reducing its frequency.

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