



Commentary

Commentary on “Clinical relevance of occult infections in spinal pseudarthrosis revision”



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Commentary

Occult infection has been established in the literature as risk factor for pseudoarthrosis in spine surgery, influencing the outcome of the index surgery but also those of the subsequent revision(s). To better define the potential impact of occult spine infections on outcome of revision and re-revision surgery, Burkhard et al. [1], conducted a matched cohort comparison study.

The study population was drawn from 128 patients who underwent thoracolumbar revision surgery for symptomatic spinal pseudoarthrosis. This group had no gross signs of infection clinically on prerevision imaging. None of the included patients had a history of prior antibiotic therapy outside of routine surgical prophylaxis.

All patients had routine sampling at revision, and an occult infection was defined by the presence of two or more positive intraoperative cultures growing the same organism and/or positive sonification fluid culture with greater than 50 colony-forming units (CFUs). Those diagnosed occult infection group were matched to those without diagnosed occult infection based on fusion length and length of follow-up using a 1:2 fuzzy matching technique. Subsequent re-revision surgery and post-operative patient-reported outcome measures (PROMs) were assessed and compared.

The final matched cohort included 9 in the occult infection group and 18 in the noninfected control group. The groups were similar in demographics, except that the control group had a lower number of prior lumbar surgeries ($p=.027$). None of the patients in either group had history of smoking. Both groups had a similar follow-up time (median=25 months). All patients underwent posterior instrumented revision surgery with or without interbody fusion. From the occult infection group, *Cutibacterium acnes* was identified for 5 patients, *Staphylococcus epidermidis* for 3 patients, and *Enterococcus faecium* for one patient. Antibiotic treatment was initiated for all patients in the occult infection group with no major complications related to the surgery or antibiotic treatment.

The study found that the rate of re-revision-free survival after the initial pseudarthrosis revision surgery was numerically higher, but not

statistically different, for the occult infection group (77.8%) than in the noninfectious control group (44.4%) ($p=.22$). The total number of re-revision surgeries was numerically lower, but again not statistically different, for the occult infection group (2 re-revision surgeries in 2 patients) than in the control group (13 re-revision surgeries in 10 patients, $p=.08$). There were no significant differences in patient reported outcome measures (PROMs) between the occult infection group and the noninfectious control group.

Overall, these findings failed to show a statistical difference in outcomes for those with versus without occult infection when undergoing revision surgery in this relatively small cohort comparison study. The authors acknowledge that the study was underpowered to detect differences, but this is a challenging clinical scenario to amass sufficient patients.

However, the lack of statistical difference suggests that the magnitude of difference is likely limited because statistical difference was not detected based on the sample assessed. The authors of the study note that this may be due to targeted treatment of the identified cause of pseudarthrosis in the occult infection group. The study's findings are important, as they provide preliminary insight into the outcome of this clinical situation and may set the stage for further studies to expand upon these findings to further clarify the management and clinical outcomes thoracolumbar pseudarthrosis surgery with versus without occult infections.

Declarations of competing interests

One or more of the authors declare financial or professional relationships on ICMJE-NASSJ disclosure forms.

Reference

- [1] Burkhard MD, Hassanzadeh A, Andronic O, Götschi T, Uçkay I, Farshad M. Clinical relevance of occult infections in spinal pseudarthrosis revision. *North Am Spine Soc J (NASSJ)* 2022;12:100172.

FDA device/drug status: Not applicable.

Author disclosures: **TD**: Nothing to disclose. **DR**: Consulting: Depuy-Synthes (B); Consulting: SI Bone (B).

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<https://doi.org/10.1016/j.xnsj.2023.100213>

Received 18 March 2023; Accepted 19 March 2023

Available online 29 March 2023

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