



Is your surgical field as sterile as you think when operating patients with adolescent idiopathic scoliosis?

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Background

Late surgical site infection (>90 days) is seen in 1.7 to 6.9% of patients undergoing surgery for AIS. *Cutibacterium acnes* (*C. acnes*) is reported to be the most common finding in these patients. However, the same pattern is not seen ASD patients. *P. acnes* is known to act as an opportunistic pathogen through biofilm. Particularly shoulder arthroplasties but also breast implants and cardiovascular device-related infections are known to have high infection rates with that pathogen. However, whether inoculation is hematogenic or the result of bacterial contamination at the initial surgery is not known.

Methods

We prospectively included patients at least two years after their last spine surgery (ASD group) or no prior spine surgery (AIS group) undergoing surgery at our institution from January 1 through December 31, 2020. The patients were surgically prepared according to the consensus guidelines. Three muscle tissue samples were obtained before wound closure, and two positive cultures were considered a positive test result. Furthermore, the unused rod tip was sent for sonication. All cultures were observed for 14 days. All positive tests for skin bacteria were whole genome

sequenced (WGS) in order to rule out a single contaminate source among the surgical staff.

Results

We included 162 AIS patients and 23 ASD patients. There were no statistically significant differences between the 2 groups regarding surgical time or blood loss. Cultures were positive in 112 AIS patients (68%) and in 2 ASD patients (8.6%). Of the 112 positive AIS cultures 100 had *C. Acnes* as the only pathogen. The remaining were other skin bacteria. Bacteria were found on 92 of the rod tip (81%) all were *C. acnes*. WGS showed no sign of a single contaminate source.

Conclusion

C. acnes is present in the muscle tissue of most patients surgically treated for AIS. In the majority of cases the same bacteria were found on the unused sterile implant only handled by the surgeons, possibly by contamination from the surgical gloves. Surgeons treating these patients should therefore make sure of targeting this pathogen in their prophylactic strategy.