

Session: Free Papers C

[FP22] IN VITRO EVALUATION OF BACTERIAL ADHESION AND BIOFILM FORMATION TO METALLIC CERCLAGE WIRE VERSUS POLYMER CERCLAGE SYSTEM

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Aim: To evaluate bacterial adhesion and biofilm formation to metallic cerclage wire versus polymer cerclage system (SuperCable®)

Methods: Experimental *in vitro* study to evaluate quantitative bacterial adherence to different cerclage wire materials. Two types of cerclage wires were compared: a metallic versus a polymer based wire (SuperCable®).

A two-centimeter cerclage wire piece of each material was included in 2 mL of tryptic soy broth (TSB) culture media, inoculated with 10 microliters of a 0.5 McFarland of a *Staphylococcus epidermidis* strain and cultivated at 37°C during 2h for adhesion and 48h for biofilm formation. After this time, the cerclages were washed using a 1% phosphate buffered saline (PBS) and sonicated in new culture medium. After sonication, dilutions of each culture were spread in TSB agar and incubated 37°C during 24h. The number of colonies were counted and the cfu/cm² was calculated.

Results: There were no differences in the number of colonies counted at 2 hours. At 48 hours, the polymer cerclage system showed a clinically and statistically reduction of 95.2% in the biofilm formation of *S. epidermidis*.

The highest bacterial counts were observed in metallic cerclages after 48h.

Conclusion: In *in vitro* conditions, the polymer cerclage system may offer decreased biofilm formation compared with metallic cerclage wires. However, there are many other factors in *in vivo* conditions that could play a role in bacterial adhesion to cerclage wires. Further research is needed in order to recommend the use of polymer cerclage systems for septic revision surgery.