■ Research Brief

A Study on the Biofilm Formation Inside the Narrow Channels Simulating Endoscope

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Background: Flexible endoscopes are widely utilized in clinical settings. However, the complex structure makes decontamination and disinfection difficult. Especially the formation of biofilm in narrow space makes decontamination and disinfection even more difficult. In addition ,some bacteria can live and create biofilm even in organic-poor water.

Objective: To create an experimental biofilm model in polytetrafluoroethylene (PTFE) tube, which is use for inner channel of flexible endoscope.

Design: Experimental study

Setting: Static culture for one week at room temperature

Subjects: PTFEtube *Pseudomonas aeruginosa* ATCC15442 tryptic soy broth cleaner

Methods: The PTFE tube was put in the culture solution added with organic substance, water, detergent, and *Pseudomonas aeruginosa* ATCC15442, then they were cultivated for seven days at 22 □. And then the number of bacteria cells in biofilm was counted with scanning electron microscope (SEM).

Results: The comparison between with only the organic substance and the one with detergent and organic substance, no apparent difference in the number of bacterial cells was observed. Many aggregates of the bacterial cells were observed in the culture solution with high concentration of a detergent. A slight biofilm formation was observed only in the culture with sterile purified water.

Conclusions: The biofilm model was experimentally created, and the results showed the factor affecting the biofilm formation was not only an organic substance but also detergent.
This study demonstrated the reconsideration of the method of decontamination and disinfection of the endoscope channel.