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Titel des Beitrags:
In vitro evaluation of novel antimicrobial coatings for surgical sutures using octenidine.

Abstract:
Sutures colonized by bacteria represent a challenge in surgery due to their potential to cause surgical site infections. In order to reduce these type of infections antimicrobially coated surgical sutures are currently under development. In this study, we investigated the antimicrobial drug octenidine as a coating agent for surgical sutures. To achieve high antimicrobial efficacy and required biocompatibility for medical devices, we focused on optimizing octenidine coatings based on fatty acids. For this purpose, antimicrobial sutures were prepared with either octenidine-laurate or octenidine-palmitate at 11, 22, and 33 µg/cm drug concentration normalized per length of sutures. Octenidine containing sutures were compared to the commercial triclosan-coated suture Vicryl® Plus. The release of octenidine into aqueous solution was analyzed and long-term antimicrobial efficacy was assessed via agar diffusion tests using Staphylococcus aureus. For determining biocompatibility, cytotoxicity assays (WST-1) were performed using L-929 mouse fibroblasts. In a 7 days elution experiment, octenidine-palmitate coated sutures demonstrated much slower drug release (11 µg/cm: 7%; 22 µg/cm: 5%; 33 µg/cm: 33%) than octenidine-laurate sutures (11 µg/cm: 82%; 22 µg/cm: 88%; 33 µg/cm: 87%). Furthermore sutures at 11 µg/cm drug content were associated with acceptable cytotoxicity according to
ISO 10993-5 standard and showed, similar to Vicryl® Plus, relevant efficacy to inhibit surrounding bacterial growth for up to 9 days. Octenidine coated sutures with a concentration of 11 ?g/cm revealed high antimicrobial efficacy and biocompatibility. Due to their delayed release, palmitate carriers should be preferred. Such coatings are candidates for clinical testing in regard to their safety and efficacy.