Benefit of Antibacterial Coating on Sutures

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In the Literature

McCagherty J, Yool DA, Paterson GK, et al. Investigation of the in vitro antimicrobial activity of triclosan-coated suture material on bacteria commonly isolated from wounds in dogs. *Am J Vet Res*. 2020;81(1):84-90.

FROM THE PAGE ...

Surgical site infections remain a costly issue that increases morbidity and sometimes mortality in veterinary patients. To minimize surgical site infections, antibacterial-coated suture materials are available for use in human and veterinary patients. Triclosan-coated suture materials have been tested in human medicine and are recommended by the World Health Organization; limited testing has been performed in veterinary patients.

In this study,* triclosan-coated polydioxanone (monofilament), poliglecaprone-25 (monofilament), and polyglactin-910 (multifilament) were tested in vitro for effectiveness against clinical isolates from canine wound infections: methicillin-resistant *Staphylococcus pseudintermedius*, methicillin-susceptible *S pseudintermedius*, *Escherichia coli*, and AmpC β-lactamase– and extended-spectrum β-lactamase–producing *E coli*.

Isolates were cultured on Mueller-Hinton agar with the 3 types of triclosan-coated suture as well as with uncoated counterparts of the same suture types. Zones of inhibition were measured after overnight incubation, and sustained antimicrobial activity assays were performed with susceptible isolates. The coated monofilaments performed best against all bacterial strains, with the greatest zones of inhibition and the longest duration of antibacterial action as compared with either polyglactin-910 suture (ie, triclosan-coated and non-triclosan–coated).

Triclosan-coated suture was more effective against staphylococcal isolates than against *E coli* isolates, both in zones of inhibition and duration of antimicrobial effect. *E coli* possibly requires a higher concentration of triclosan than do staphylococcal isolates. Coated and uncoated

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poliglecaprone-25 and polydioxanone had the least bacterial adherence when scanned under electron microscopy as compared with braided polyglactin-910. Polydioxanone had a slight increase of adherence by *E coli*, possibly due to its characteristic surface ridges appreciated when scanned with electron microscopy; this suggests the surface characteristics of sutures may be as significant as an antibacterial coating in combating bacterial colonization of the suture.

… TO YOUR PATIENTS

Key pearls to put into practice:

1. Braided suture materials are more prone to bacterial colonization than monofilament materials and should be avoided in infected or contaminated surgical wounds or in wounds in which infection could be catastrophic (eg, joints, implants). The increased surface area and intertwining nature of multifilament suture provides more interstices for bacteria to harbor.

2. Comfort is a benefit of braided suture. Absorbable, braided material (eg, polyglactin-910) can be used safely in superficial mucosa, gingival, and periocular skin closure, as these sutures are gentler in regions where monofilament sutures might be abrasive.

3. Triclosan-coated suture material can be helpful in regions where infection is present or where the effects of infection would be especially deleterious. However, proper surgical technique, adherence to Halsted's principles, and proper selection of suture based on its inherent characteristics is critical and likely more important than the use of antibacterial-coated suture.

4. In heavily contaminated or infected wounds, suture material that degrades rapidly after the required time for healing is highly desirable. This decreases the load of foreign material that WBCs must handle, allowing bacterial degradation and tissue healing. Shorter-acting suture material is less likely to provide a scaffold for morbidity-increasing biofilms.

5. There is no benefit to using a suture that is stronger than the tissue it is used in. Sutures that persist longer than necessary can increase morbidity at any surgery site.

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Suggested Reading

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