

Editorial

Local Antimicrobial Treatment in Orthopaedic Surgery

Antonia F. Chen^{1,2}✉, Heinz Winkler^{3,4}✉

1. Rothman Institute, Sidney Kimmel School of Medicine, Thomas Jefferson University, 925 Chestnut Street, Philadelphia, PA, 19107, USA
2. Vice President, Musculoskeletal Infection Society of North America, Rochester, MN 55963-0422, USA
3. Osteitis Centre, Privatklinik Döbling, Vienna, Austria
4. Past President of EBJIS, European Bone and Joint Infection Society, ZA La Piece 2, 1180 Rolle, Switzerland

✉ Corresponding author: antoniachen1@gmail.com; heinz.winkler@speed.at

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Abstract

The purpose of this special issue of *Journal of Bone and Joint Infection* is to provide orthopaedic surgeons with basic science explanations as to how these local antimicrobials work, clinical evidence that supports these local treatments, and the role of these local treatments against biofilm.

Key words: local antimicrobial, orthopaedic surgery

Infections after orthopaedic surgery are devastating complications. Now that it has been realized that these chronic infections are caused by biofilm-forming bacterial pathogens, new technologies are required. There have been great strides taken in recent history to prevent and treat infections. Topical antimicrobials are effective methods for preventing infection when used in certain surgical procedures, and are efficacious for treating infectious processes locally. One of the topical antimicrobials covered in this special issue is dilute povidone-iodine, which has been shown to reduce the risk of deep surgical site infection in multiple surgical specialties. Hydrogen peroxide can also be utilized to decrease the risk of reinfection when treating a periprosthetic joint infection, but may be cytotoxic and should not be used in the treatment of partial knee replacements, hemiarthroplasties, or native joints. Chlorhexidine gluconate solution and scrub are useful for a variety of purposes, including pre-operative skin cleansing, surgical site preparation, hand antisepsis of the surgical team and intra-articular irrigation of infected joints. Local vancomycin powder has been applied to orthopaedic surgical sites to decrease the risk of infection, and hyaluronic acid can be applied in orthopaedic surgery

cases to reduce bacterial adhesion and biofilm formation.

Antibiotics are successfully administered prophylactically, but systemic application may provide only eradication of planktonic bacteria. Biofilm embedded bacteria usually require much higher concentrations for elimination, which can only be reached by local application, delivering very high concentrations of antibiotics locally and "on demand." Several substances have been identified as possible carriers of antibiotics, such as hydrogels, ceramic biocomposites, impregnated in bone allograft, and loaded into polymethylmethacrylate cement. Antibiotics impregnated in bone allograft has the benefit of restoring bone loss and incorporation into host bone. Ceramic biocomposites can fill bone voids, and polymethylmethacrylate cement can provide strength to areas that are missing bone.

The purpose of this special issue of *Journal of Bone and Joint Infection* is to provide orthopaedic surgeons with basic science explanations as to how these local antimicrobials work, clinical evidence that supports these local treatments, and the role of these local treatments against biofilm. In addition, this issue details specific algorithms and surgical techniques that readers can emulate when treating chronic

musculoskeletal infections in their own institutions. Our hope is that these techniques can be adopted into regular clinical practice for preventing and treating infections after orthopaedic surgery, and may improve the care that we presently provide for our patients.

Competing Interests

The authors have declared that no competing interest exists.

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