

Local bacteriophage therapy for chronic osteomyelitis: current hurdles and future perspectives

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INTRODUCTION: Musculoskeletal infections present a serious challenge to treat due to the increasing rate of bacterial resistance mechanisms against commonly used antibiotics. In this regard, a promising alternative treatment strategy is bacteriophage therapy, which relies preferably on the *in-situ* application of naturally-occurring phages to infect and lyse bacteria. Here, we present four cases with chronic osteomyelitis, refractory to conventional treatment strategies, who were treated with a combination of local phage therapy and antibiotics.

METHODS: In three cases the infection was polymicrobial, caused by *Staphylococcus* spp. and/or *P. aeruginosa* and/or *Streptococcus* spp. In the fourth case, the causative pathogen was *E. faecalis*. BFC 1.10, produced by the Queen Astrid Military Hospital (Belgium), contains phages against *S. aureus* and *P. aeruginosa*. In all three patients with polymicrobial infections, the isolated staphylococci were found susceptible to this cocktail. For the fourth case, the commercial Pyobacteriophage cocktail, containing additional phages active against *Enterococcus* spp. and provided by the Eliava Institute (Georgia), was selected. After thorough debridement, a gentamicin-coated collagen sponge soaked in phage solution was placed in the infected site intraoperatively. Subsequently, a draining system was placed in