



Chronic Infections of Knee Megaprotheses: Exploring the Viability of Off Label DAIR-Plus

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DESCRIPTION

Knee megaprotheses are commonly used in patients who undergo joint replacement surgeries, particularly in the context of extensive bone loss, malignancies, or complex fractures. While they can significantly improve a patient's mobility and quality of life, one of the most concerning complications following knee megaprosthesis implantation is chronic infection. Chronic infections can severely impact the prosthesis's function and the patient's overall health, necessitating effective treatment strategies. One such strategy gaining attention is the "off-label" use of DAIR-Plus (Debridement, Antibiotics, and Implant Retention with adjunctive therapies) for managing these infections. This treatment modality combines traditional debridement with aggressive antibiotic therapy and sometimes additional interventions, offering a potential solution in cases where traditional methods may not suffice. Chronic infection of knee megaprotheses is a particularly challenging issue, as the unique anatomy and structure of these implants can make infection management more complex. Once an infection is established, it may lead to biofilm formation on the surface of the prosthesis, making it resistant to conventional antibiotic treatments. Biofilms are a major reason why chronic infections persist despite systemic antibiotic therapy, as they shield the bacteria from immune responses and antibiotics. Traditional treatments for infected knee megaprotheses often involve implant removal, extensive debridement, and long-term antibiotic therapy. However, for patients with functional prostheses or those who are at high surgical risk, such an approach may not be feasible or desirable. This has led to the exploration of alternative strategies like DAIR-Plus, which offers a less invasive option. DAIR-Plus involves debridement of infected tissue, retention of the prosthesis, and the use of high-dose antibiotics. The "Plus" typically refers to additional interventions aimed at enhancing the efficacy of treatment,

which could include the use of antibiotic-loaded cement, local delivery systems for antibiotics, or even adjunctive biologics to promote healing. The idea behind DAIR-Plus is to retain the knee megaprosthesis while aggressively managing the infection, thus preventing the need for prosthesis removal and minimizing the disruption to the patient's mobility. For patients with knee megaprotheses, this approach can be particularly beneficial, as removing and replacing the implant can be a lengthy and complex process that may not always guarantee a successful outcome. The off-label use of DAIR-Plus is being considered in cases where traditional approaches may be inadequate or where patients are unwilling to undergo the more invasive procedure of implant removal. Some evidence suggests that, when performed early in the course of infection, DAIR-Plus can be an effective option, particularly when the infection is localized and the prosthesis remains mechanically stable. However, its success depends on several factors, including the virulence of the infecting microorganism, the presence of biofilms, and the patient's overall health and immune status. Infections caused by more resistant organisms, such as methicillin-resistant *Staphylococcus aureus* (MRSA), may be less responsive to DAIR-Plus, requiring careful consideration of antimicrobial therapy. Furthermore, long-term outcomes of DAIR-Plus in knee megaprosthesis infections remain uncertain, with some studies showing mixed results regarding reinfection rates and the durability of prosthesis retention.

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CONFLICT OF INTEREST

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