Continuous Local Antibiotics Perfusion (CLAP) on Treatment Efficacy in Fracture-Related Infections: A Multi-Center Study

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Purpose: Fracture-related infections (FRI) remain a challenging problem in orthopaedic trauma surgery. In recent years, continuous local antibiotic perfusion (CLAP), which involves the direct infusion of a highly concentrated gentamicin solution into infected intramedullary canals and/or soft tissues, has emerged as a promising treatment that offers potential advantages over traditional local antibiotic delivery. This study aimed to evaluate the efficacy of CLAP in patients with FRI.

Methods: This retrospective cohort study was conducted at ten institutions and included 169 patients who underwent surgical treatment for FRI between 2019 and 2022 with a follow-up period of at least 1 year. The mean age of the patients was 53.1 years (range: 13–90 years). The primary outcome was the success rate of infection control, and the secondary outcomes included the recurrence rate and incidence of acute kidney injury (AKI). Patients were divided into two groups based on whether CLAP was performed: the CLAP group and the non-CLAP group. Univariate analysis was conducted to compare variables between the two groups. Multivariate analysis was performed with primary and secondary outcomes as dependent variables.

Results: The success rate was significantly higher in the CLAP group than that in the non-CLAP group (86% vs 71%, $p = 0.03$). The recurrence rate was significantly higher in the non-CLAP group (13% vs 32%, $p = 0.003$). There was no significant difference in the incidence of AKI between the two groups ($p = 0.6$). In multivariate analysis, CLAP was significantly associated with the success rate of infection control (OR: 3.6, 95% CI: 1.37–9.42, $p = 0.01$). Furthermore, CLAP was associated with a lower rate of recurrence (OR: 3.4, 95% CI: 1.47–7.77, $p = 0.004$). Regarding adverse effects, CLAP was not significantly associated with AKI (OR: 1.76, 95% CI: 0.513–6.030, $p = 0.37$).

Conclusion: In this multi-center study of 169 FRI patients, CLAP was associated with a higher success rate of infection control and a lower recurrence rate without increasing adverse events.