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A Randomized Clinical Trial of Articulating and Static Spacers in the Management of Chronic Periprosthetic Knee Infection

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Introduction: The purpose of this multi-center, randomized clinical trial was to compare static and articulating spacers in the treatment of periprosthetic joint infection (PJI) complicating total knee arthroplasty (TKA).

Methods: 68 patients undergoing resection arthroplasty as part of a two-stage exchange for PJI at three centers were randomized to receive either a static (32 patients) or articulating spacer (36 patients). 49 Patients (72.1%) were available for follow-up at a mean 3.5 years (range: 2.0 to 6.4 years); 6 patients died, 7 were lost to follow-up, 3 were screen failures, 2 withdrew after surgery and one patient cancelled prior to surgery. Power analysis determined that 28 patients per group (56 total) were necessary to detect a 13° difference in range of motion (ROM) between groups with 80% power and alpha=0.05.

Results: Patients in the static spacer group had significantly longer mean hospital length of stay (LOS: 6.1 vs. 5.1 days; p=0.032). At final follow-up, the mean arc ROM in the articulating spacer cohort was significantly higher at 113.0° compared to 100.2° in the static spacer cohort (p=0.001). The mean Knee Society Score (KSS) was significantly higher in the articulating spacer cohort (79.4 vs. 69.8 points; p=0.043). Patients in the static spacer cohort had a greater need for an extensile exposure at the time of reimplantation (16.7% vs. 3.8%), and higher rates of reoperation (33.3% vs. 12.0%) and reinfection (12.0% vs. 8.0%). However, the latter differences did not reach statistical significance with the sample size studied.

Conclusions: This randomized study demonstrated that the use of an articulating spacer, compared to a static spacer, during the first stage of a two-stage exchange provided higher ROM, shorter LOS, and higher KSS. When the soft tissue envelope allows, and if there is adequate bony support, an articulating spacer is associated with improved outcomes.