Paper #1

No Difference in Survivorship or Functional Outcome Between Surgeon Preference for Computer Assisted Navigation vs. Conventional Instrumentation in 19,221 Total Knee Arthroplasties at 12 years

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Introduction: This study compares the revision rates and functional outcomes of total knee arthroplasty (TKA) implanted using computer-assisted surgery (CAS) with conventional instrumentation from a large national database at up to 12 years follow-up. Recognizing that selection bias may arise from the preferential use of CAS in difficult or complex cases, the implant survival data and postoperative functional scores were analyzed with reference to whether the surgeon routinely implanted TKA using CAS or conventional instrumentation.

Methods: Revision rates and functional data in terms of Oxford Knee Questionnaire (OKQ) scores at six months, five years and ten years were obtained for 19,221 TKAs implanted between 2006 and 2018 from the New Zealand Joint Registry (NZJR). This data was analyzed comparing two patient cohorts: 1) those treated by high volume surgeons who implanted using CAS for >90% of TKAs ("routine CAS"); and 2) those treated by high volume surgeons using CAS for <10% of TKAs ("routine conventional").

Results: After 12 years, the revision rate per 100 component years was 0.437 for the "routine CAS" surgeons compared to 0.440 for the "routine conventional" surgeons (p=0.734). For patients under the age of 65, the revision rate per 100 component years was equivalent for "routine CAS" surgeons compared to "routine conventional" surgeons (0.585 vs. 0.508, p=0.524). The OKQ scores were similar at six months (38.88 vs. 38.52, p=0.172), five years (42.26 vs. 41.77, p=0.206) and ten years (41.59 vs. 41.74, p=0.893) when comparing the two cohorts. Surgeons who performed more than 50 TKAs using CAS took 13 minutes longer on average than those using conventional instrumentation (89 minutes vs. 76 minutes, p<0.001).

Conclusions: We found no difference in implant survival between CAS and conventional instrumentation systems, even when controlling for potential surgeon bias of using CAS in only difficult cases.