A Comparison of the Accuracy of Customized Instrumentation in TKA between Arthroplasty and General Orthopaedic Surgeons.

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Introduction

Computer-assisted surgery (CAS) was developed to improve limb and implant alignment in TKA. It has not been found helpful to the general orthopaedic surgeon.

Customized instrumentation (CI) utilizes preoperative MRI reconstructions and may offer the general orthopaedic surgeon a more accurate and reproducible TKA.

The purpose of this study was to evaluate the accuracy with which Joint arthroplasty surgeons at a large academic institution and a General orthopaedic surgeon in a community hospital could perform TKA using CI.

Methods

- 111 CI TKA were performed by two joint arthroplasty-trained surgeons at a large academic institution. 98 CI TKA were performed by a general orthopaedic surgeon in a community hospital.

- CI-predicted femoral and tibial component size from the CI template was compared to the actual component selection. CI-predicted resection levels for the femur and tibia were recorded and compared to the actual resections using manual calipers.

- The frequency and magnitude of additional bone resections were recorded. Postoperative radiographic alignment was evaluated.

Results

- The CI system accurately predicted femoral component size in 89% of cases for the arthroplasty-trained and 93% for the general orthopaedic surgeon.

- Results were similar in regards to the discrepancy between CI predicted and actual femoral and tibial bone cuts ($p>0.05$). The frequency of additional bone resections beyond the CI predicted resections was similar. Postoperative radiographic alignment was similar between the two groups.

Discussion

- Customized instrumentation is capable of accurate TKA for both the arthroplasty-trained and general orthopaedist.

- The adaptability of the system to familiar instruments, ease of placement of the customized cutting guides, ability to perform the anatomic registration pre-operatively in three-dimensions, and reduced instrumentation requirements are notable benefits of CI.

Conclusion

Customized instrumentation is capable of accurate TKA and may offer an attractive alternative to CAS for the performance of a more accurate TKA, especially for the general orthopaedic surgeon.