

AB114. 132. 'Deep blue' verses arthroplasty surgeon: validating the benefits of computer-templated total knee replacement

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Background: Patient-specific instrumentation (PSI) is a recent advance in knee arthroplasty designed to ensure accurate positioning of implants. Customized cutting blocks are generated from a preoperative 3-dimensional model created using CT or MRI. Apparent benefits include reduced pain, improved alignment, decreased 'knife to skin' and decreased expenditure. We decided to investigate these compelling claims within our own joint arthroplasty practice.

Methods: We captured data prospectively on a cohort of 200 consecutive patients. Each patient was pre-assessed prior to surgery and 50% were randomly allocated for PSI custom knee arthroplasty (using Biomet Signature implants). At each consultation sleep disturbance, comfortable walking distance, daily oral analgesia and their

effectiveness were assessed. This data set was then analysed and charted in R.

Results: PSI cutting blocks are designed to provide improved postoperative alignment. In order to investigate this claim we reviewed all plain film radiographs taken preoperatively and at 6-week, 6-month and 2-year post operatively. Neither preoperative valgus angle, 6-week valgus angle nor 6-month valgus angle were significant. While the 2-year valgus angle appears significant this result is based on sparse data points.

Conclusions: Our work shows that the use of PSI is not significant for pre-op pain (P=0.32), pain at 6-week (P=0.68) or pain at 6-month (P=0.51). Moreover, PSI does not significantly improve valgus angle at 6-week (P=0.19), 6-month (P=0.43) or 2-year post-surgery. Preoperative CT/MR imaging and custom cutting blocks add approximately 7% to the cost of total knee replacement. It would seem that PSI computer-assisted surgery, such as the Biomet Signature prosthesis, is of little benefit compared to the manual techniques of an experienced knee arthroplasty surgeon.

Keywords: Computer; assisted; manual; template; knee; replacement

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