

## **Does Neutral Mechanical Alignment Improve the Durability of Revision Total Knee Arthroplasty?**

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**Introduction:** In contrast to primary total knee arthroplasty (TKA), little attention has been given to the relationship between durability and coronal alignment in revision TKAs. We hypothesized that a postoperative mechanical axis of  $0\pm 3^\circ$  would result in better survivorship and functional outcomes, and retrospectively studied a large cohort of revision TKAs.

**Methods:** 981 revision TKAs (846 patients) were done with cemented varus-valgus constrained (VVC) implants between 2004 and 2014 at a single institution, and the 411 (42%) with pre- and post-revision hip-knee-ankle radiographs were reviewed. Mean age at revision TKA was 65 years, with 53% females. We defined a postoperatively neutrally-aligned group of 258 knees ( $0^\circ\pm 3^\circ$ ) and an outlier group of 153 knees. The mechanical axis range of the outliers was between  $4^\circ$ - $12^\circ$  varus and  $4^\circ$ - $10^\circ$  valgus. Ten-year Kaplan-Meier survivorship was calculated, and functional outcomes were assessed via Knee Society scores (KSS).

**Results:** At most recent follow-up, 22 of 258 neutrally-aligned revision TKAs were re-revised for aseptic loosening vs. 14 of 153 in the outlier group. The 10-year survivorship free of re-revision for aseptic loosening was 82% in the neutrally-aligned group vs. 77% in the outlier group ( $p=0.84$ ). In total, 31 neutrally-aligned revision TKAs were re-revised for any cause vs. 23 in the outlier group. The 10-year survivorship free of any re-revision was 77% in the neutrally-aligned group vs. 70% in the outlier group ( $p=0.62$ ). KSS were similar between the neutrally-aligned and outlier groups at 5 years (69 vs. 74;  $p=0.56$ ).

**Conclusions:** After revision TKA with cemented VVC implants, we could not demonstrate a difference in functional outcomes or 10-year implant survivorship between a large group of mechanically well-aligned knees ( $0^\circ\pm 3^\circ$ ) and a group of outliers. While neutral mechanical alignment remains a useful goal in revision TKA, factors other than static coronal alignment may be as important in determining durability.