Does Varus Alignment Adversely Affect Implant Survival and Function Six-Years after Kinematically Aligned TKA?

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Problem

- The effects of alignment on implant survivorship and function after total knee arthroplasty (TKA) are of great interest to the surgeon and patient
- A Level 1 randomized clinical trial showed that kinematically aligned TKA provided better pain relief, function scores, and flexion than mechanically aligned TKA at 2 years (Dossett, BJJ, 2014)
- There are no reports of implant survivorship beyond 3 years for kinematically aligned TKA (Howell, CORR, 2013)

Purpose and Hypothesis

- We report the six-year implant survivorship, alignment of the tibial component, knee, and limb, and function as measured by the Oxford knee score and WOMAC score after kinematically aligned TKA
- We test the hypothesis that varus alignment of the tibial component, knee, or limb does not adversely affect survival and function

Methods and Materials

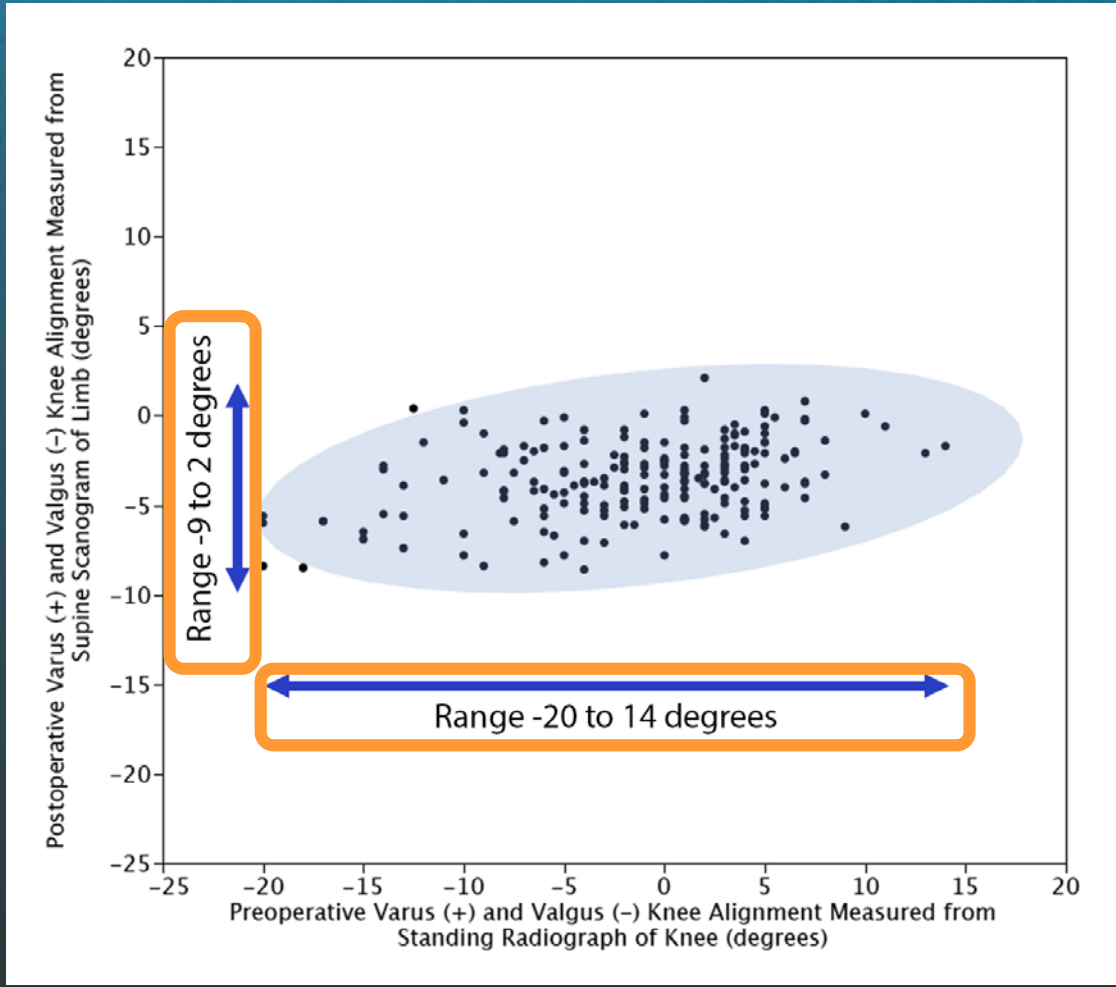
- The study cohort consisted of 214 (133 women) patients (219 knees) with an average age of 68 years (range, 39-93 years),BMI of 31 kg/m^2 (range, 14-49 kg/m^2).
- Each patient was treated with a kinematically aligned TKA and a cemented cruciate-retaining component (Vanguard; Biomet, Inc, Warsaw, IN, USA) in 2007
- Preoperative knee alignment was measured from a standing radiograph of the knee and ranged 34^0 (-20^0 valgus to 14^0 varus)

Methods and Materials

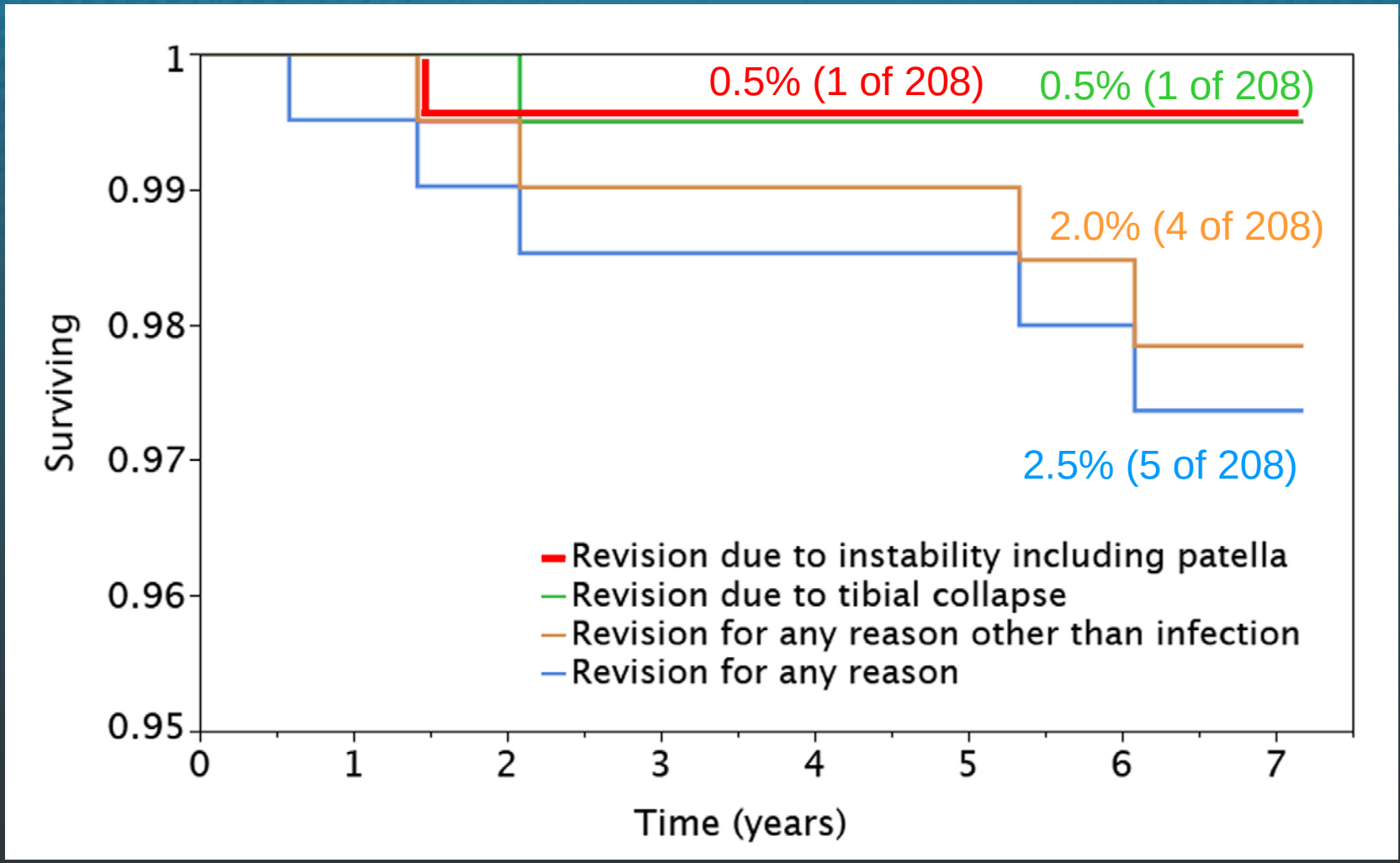
- Kaplan-Meier survival analysis determined implant failure
- The Oxford knee score (0 worst, 48 best), and WOMAC™ score (0 worst, 100 best) measured function
- We categorized tibial component alignment as in-range ($\leq 0^0$) or varus ($>0^0$), knee alignment as in-range (between -2.5^0 and -7.4^0), varus ($>-2.5^0$), or valgus ($<-7.4^0$), and limb alignment as in-range ($0^0 \pm 3^0$), varus ($>3^0$) or valgus ($<-3^0$)
- Median follow-up was 6.3 (5.8-7.2) years

Results: Kinematically Aligned TKA Corrected Varus-Valgus (V-V) Deformities

- Preop knee alignment of -20^0 to 14^0
- Postop knee alignment was -9^0 to 2^0



Results: High Kaplan-Meier Survivorship for Four Revision Endpoints at 6 Years



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Femoral-Tibial Angle	64% OKS 42	31% OKS 43	5% OKS 41	p = 0.8261

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Hip-Knee-Ankle Angle	73% OKS 43	7% OKS 42	20% OKS 42	p = 0.8261

Discussion

- Our revision-rate per 100 component years for kinematically aligned TKA of 0.40 (95% CI 0.18 to 0.93) is comparable to the revision-rate for mechanically aligned TKA of 0.64 (95% CI 0.44 to 1.19) reported by New Zealand knee arthroplasty registry for the same implant design at six-years
- The present study's high function scores are comparable to a Level 1 randomized clinical trial that reported better clinical outcomes in the kinematically aligned group than the mechanically aligned group (Dossett, BJJ, 2014)

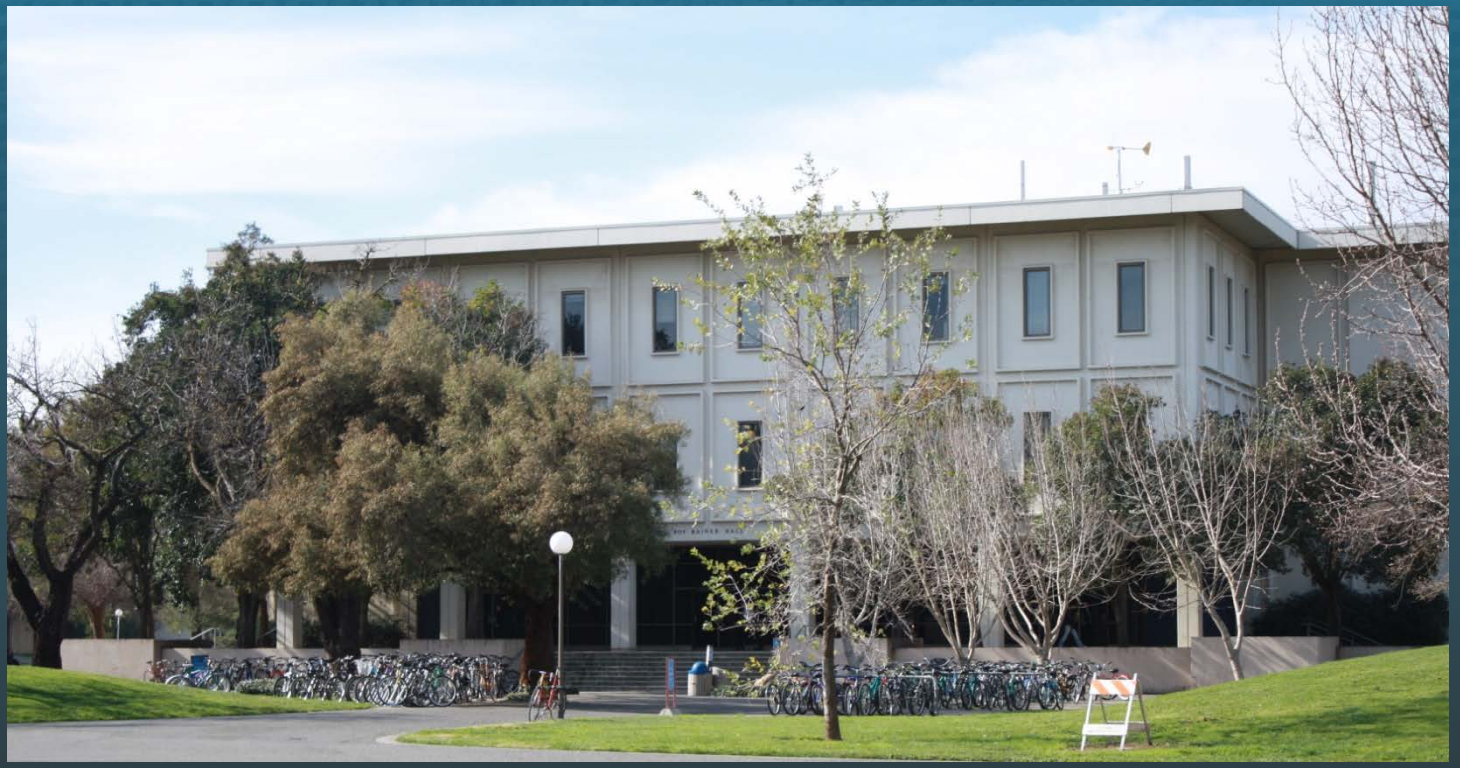
Discussion

- The similar high Oxford knee score of patients with their tibial component (80%), knee (31%), and limb (7%) aligned in varus as those patients aligned in-range and the overall low revision rate are comparable if not better than studies of mechanically aligned TKA performed with more modern implants (Williams, BJJ, 2013)

Conclusions

- At six-year follow-up, kinematically aligned TKA has an acceptable revision rate and high average function
- Varus alignment of the tibial component, varus alignment of the knee, and varus alignment of the limb do not adversely affect knee function or survival at 6-years

Thank You!



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