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BACKGROUND

- Revision total knee arthroplasty (rTKA) remains technically demanding, with higher complication rates and worse functional outcomes than primary TKA
- Rotating-hinge implants are reserved for severe bone loss, ligamentous deficiency, or recurrent instability
- Reported survivorship and complication rates vary widely across the literature, and patient-reported outcomes in this population remain poorly characterized

OBJECTIVES

- Determine re-revision rates and implant survivorship after rTKA using rotating-hinge implants at an urban, academic center
- Characterize changes in patient-reported outcome measures (PROMs) through 2 years postoperatively

METHODS

- Retrospective review of 87 patients who underwent rTKA with a rotating-hinge design between 2015 and 2025 at a single academic institution
- KOOS, JR; PROMIS Pain Intensity; and PROMIS Pain Interference were collected preoperatively and at 6 weeks, 3 months, 1 year, and 2 years
- Implant survivorship free from all-cause and aseptic revision was estimated by Kaplan-Meier analysis

RESULTS

- Eighteen of 87 patients (20.7%) underwent re-revision, most commonly for periprosthetic joint infection (12.6%), followed by aseptic loosening (4.6%), instability/malalignment (2.3%), and hinge mechanism disruption (1.1%) (Table 2)
- An additional 18 patients (20.7%) underwent reoperation without revision of the hinge construct (Table 2)
- Survivorship free from all-cause re-revision was 92.8% at 1 year and 88.9% at 2 years, while aseptic survivorship was 97.2% and 95.0%, respectively (Figure 1)
- At one year, mean KOOS, JR improved by 14.8 points, PROMIS: Pain Intensity by -5.6, and PROMIS: Pain Interference by -6.8, with gains attenuating by 2 years (Table 3)

CONCLUSIONS

- Rotating-hinge implants demonstrated favorable short- to mid-term survivorship, with aseptic survivorship of 95.0% at two years indicating durable mechanical performance
- Infection, rather than mechanical failure, was the predominant mode of re-revision, accounting for 11 of 18 re-revisions and driving the difference between all-cause and aseptic survivorship
- PROMs improved in a clinically meaningful fashion, peaking at one year before partial attenuation by two years, supporting rotating-hinge implants as a viable option for complex revision, particularly in non-septic settings

Figure 1: Kaplan-Meier Curve for Rotating Hinge Knee Implants

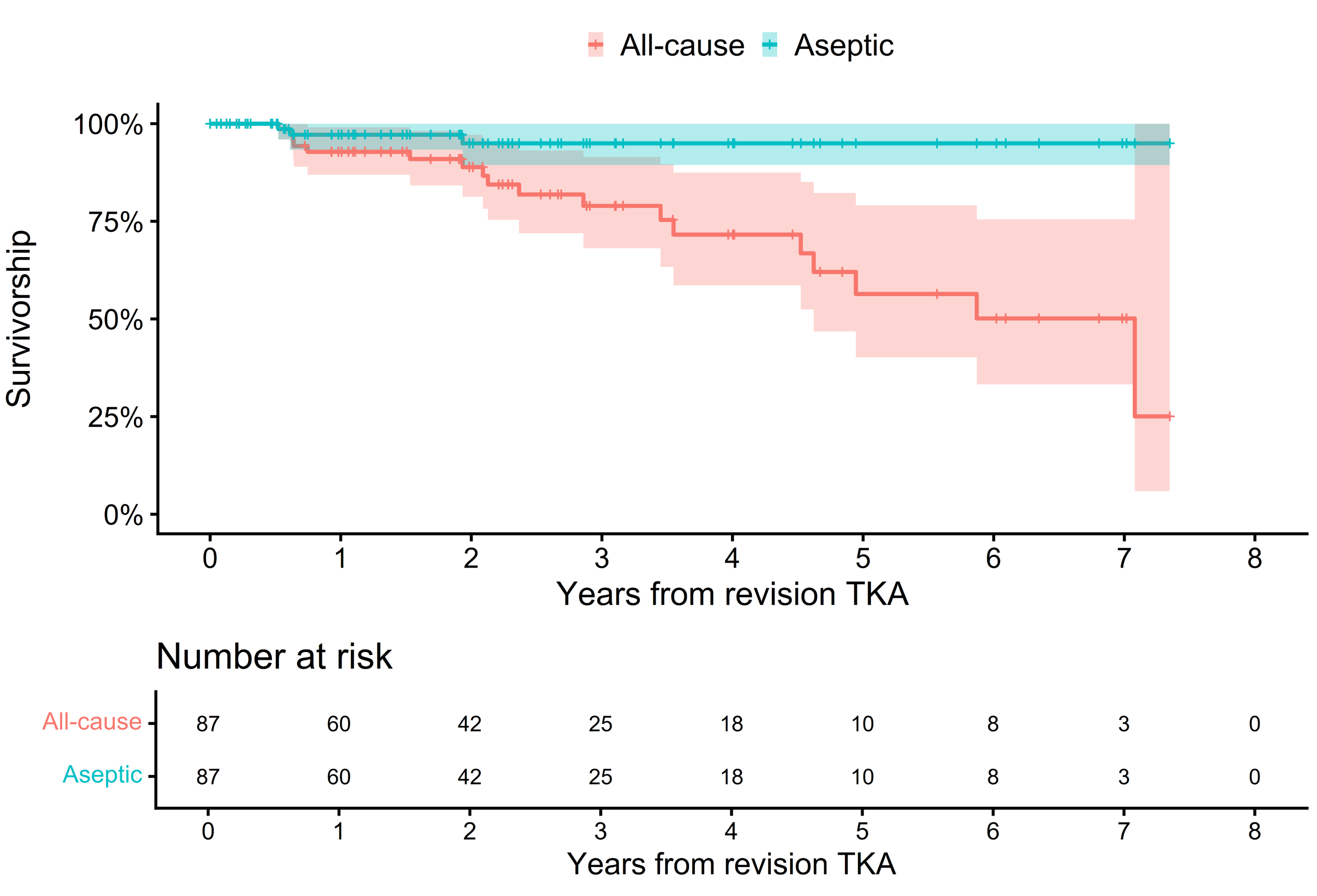


Table 1: Surgical Characteristics

Characteristic	Cohort (n = 87)
Number of first-time revisions using a hinge, n (%)	54 (62.1)
Number of subsequent revisions using a hinge, n (%)	33 (37.9)
Surgical indication for rotating-hinge implantation (%)	
Periprosthetic joint infection (second-stage reimplantation)	26 (29.9)
Arthrofibrosis	12 (13.8)
Aseptic loosening	20 (23.0)
Instability	27 (31.0)
Osteolysis	2 (2.3)
Time to last follow-up mean (years) [SD]	2.7 [2.2]

Table 2: Reoperations After Rotating-Hinge rTKA

Indication for Reoperation	Number (%)
Re-revision total knee arthroplasty	18 (20.7)
Infection (Two-stage revision arthroplasty)	11 (12.6)
Aseptic loosening	4 (4.6)
Instability/malalignment	2 (2.3)
Hinge mechanism disruption	1 (1.1)
Other reoperations (no re-revision performed)	18 (20.7)
Irrigation & Debridement	9 (10.3)
Nerve block	3 (3.4)
Extensor mechanism repair	2 (2.3)
Manipulation under anesthesia	2 (2.3)
Patellar realignment	2 (2.3)

Table 3: Patient-Reported Outcome Measures

	KOOS, JR	PROMIS: Pain Intensity	PROMIS: Pain Interference
Preoperative	48.2	53.3	66.1
At six weeks	53.6	52.0	63.7
At three months	55.8	49.5	62.0
At one year	55.6	51.3	61.6
At two years	50.7	54.2	64.1
Δ6 weeks	+6.6	-2.5	-3.5
Δ3 months	+9.5	-5.8	-5.7
Δ1 year	+14.8	-5.6	-6.8
Δ2 years	+7.9	-0.2	-2.7

Note: Δ values represent paired-subset analyses; n varies at each time point