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Postoperative Varus-Valgus Stability and Short-Term Clinical Outcomes of Total Knee Arthroplasty Using the Unrestricted Kinematic Alignment Method for Severe Varus Deformity

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Faculty Disclosure Information

- Nothing to disclosure



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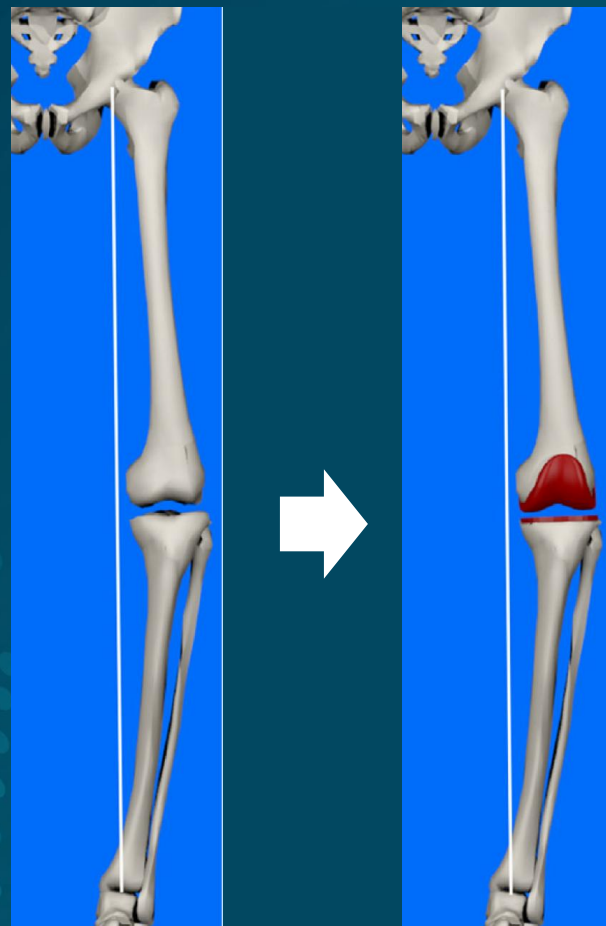


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Kinematically Aligned Total Knee Arthroplasty (KA-TKA)

Constitutional

KA-TKA

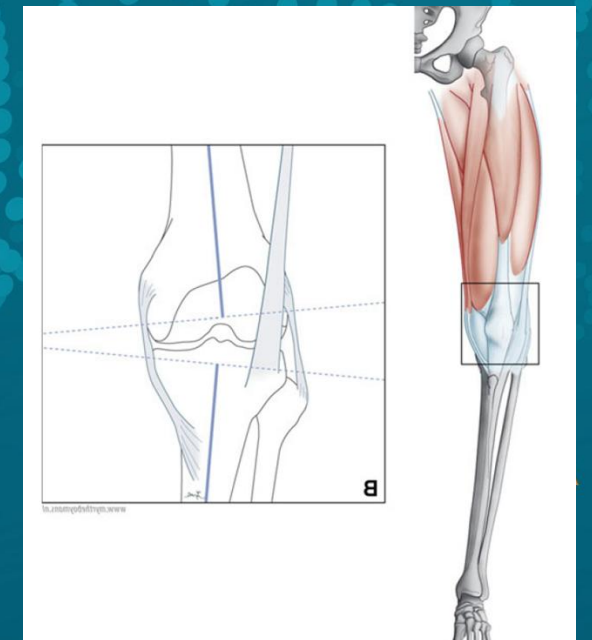


- restores the native constitutional alignment
- without releasing collateral ligaments

Howell SM et al. Orthopedics. 2008

- expected to maintain the **ligament balance** of the native knee

- few reports about KA-TKA for **severe varus knees**



Riviere C, et al. Orthop Traumatol Surg Res. 2017



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Bellemans et al. Clin Orthop Relat Res. 2011

Purpose

- to compare the postoperative alignment, ligament balance, and clinical outcomes of KA-TKA for knees with severe varus deformity to those of knees with mild varus deformity.



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Materials and Methods

Retrospective case control study
160 knees (133 patients) with KA-TKA followed for over six months

Preoperative Hip-Knee-Ankle (HKA) angle

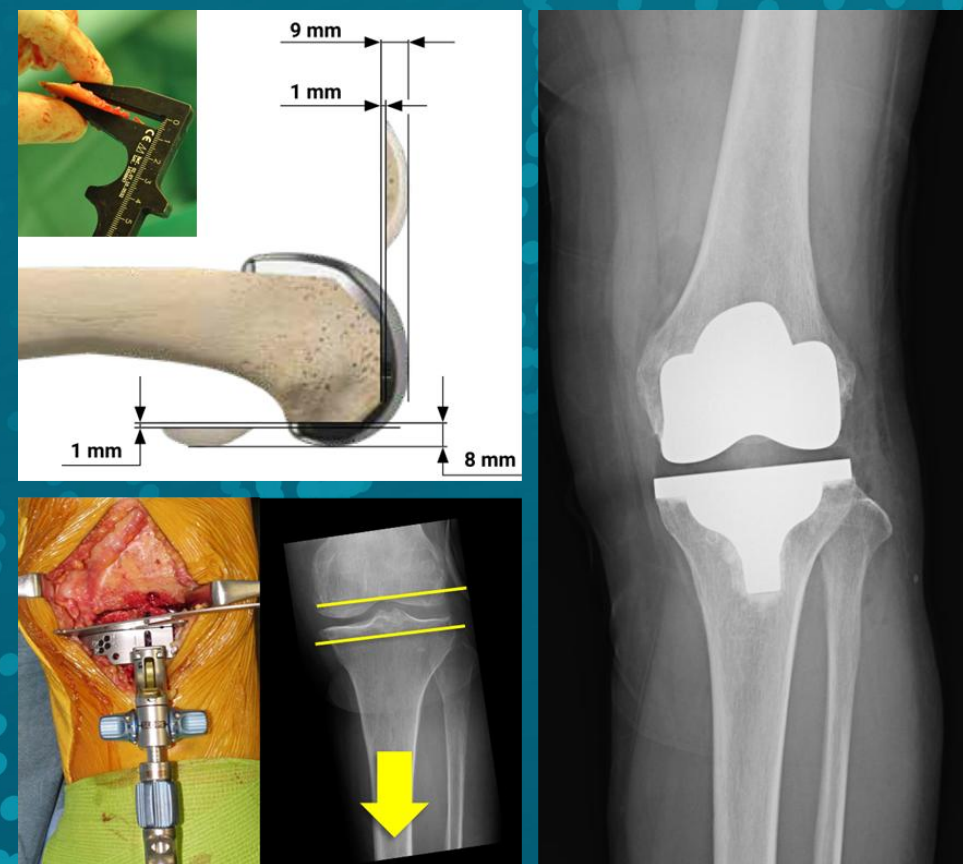
>15° severe varus group

<15° mild varus group

Surgical technique

- Calipered technique for femur
- Soft tissue respecting technique for tibia
- No ligament release

Howell SM et al. Orthopedics. 2019
Hiranaka T et al. Bone Joint Open. 2022



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Evaluation criteria

1. Demographic data (Age, sex, BMI, disease, F/U period)

2. Alignment (HKA, mLDFA, mMPTA)

Preoperative and postoperative standing Long-leg radiograph

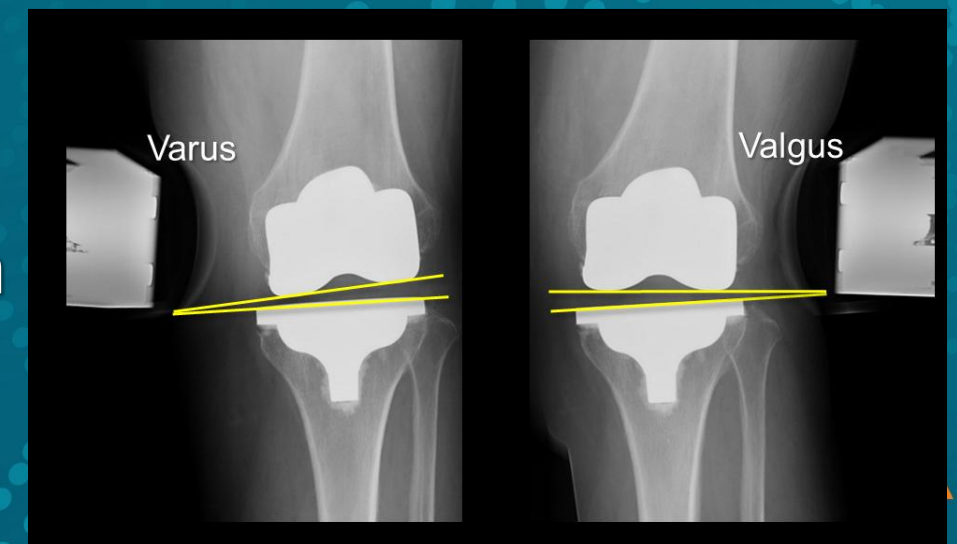
3. Varus-Valgus laxity in extention

Stress radiography using Telos stress device

- 150N of applied force, - Knee position: 15° flexion

4. Clinical results (ROM, KOOS, Complications)

Preoperative and 6M postoperative



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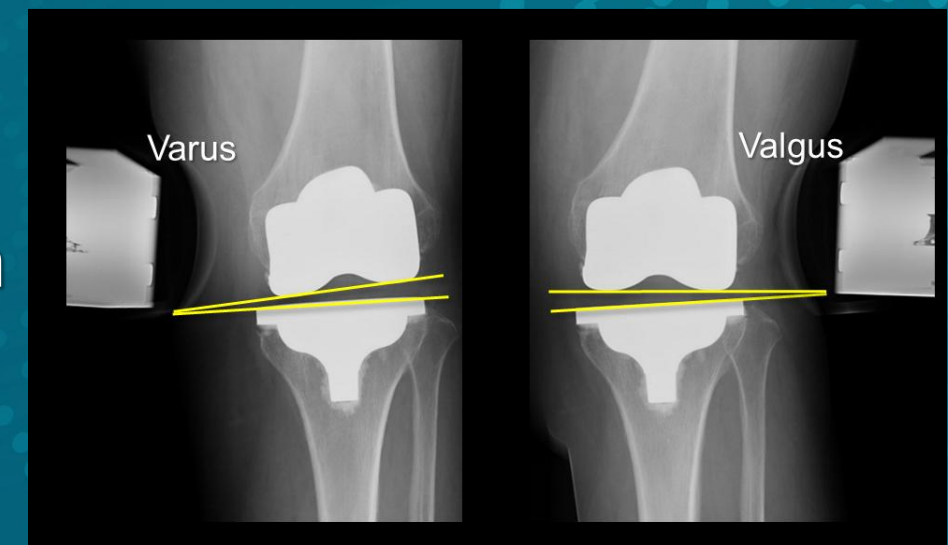
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Preoperative and 6M postoperative



Severe varus group vs Mild varus group

Mann-Whitney U test and Chi-square test
 $p < 0.05$ was considered significant



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Result 1. Demographic data

	Severe varus group (26 cases, 29knees)	Mild varus group (80 cases, 93 knees)	Significance
Sex (male)	5 (19%)	13 (16%)	n. s.
Age (years)	74.1 ± 8.8	72.8 ± 6.8	n. s.
BMI (kg/m ²)	24.6 ± 4.3	29.4 ± 6.2	P=0.017
Disease	OA 22, RA 4	OA 71, RA 9	n. s.
F/U (months)	29.3 ± 6.5	30.4 ± 7.2	n. s.

N (%) or Mean ± S. D.

n. s.: non-significant

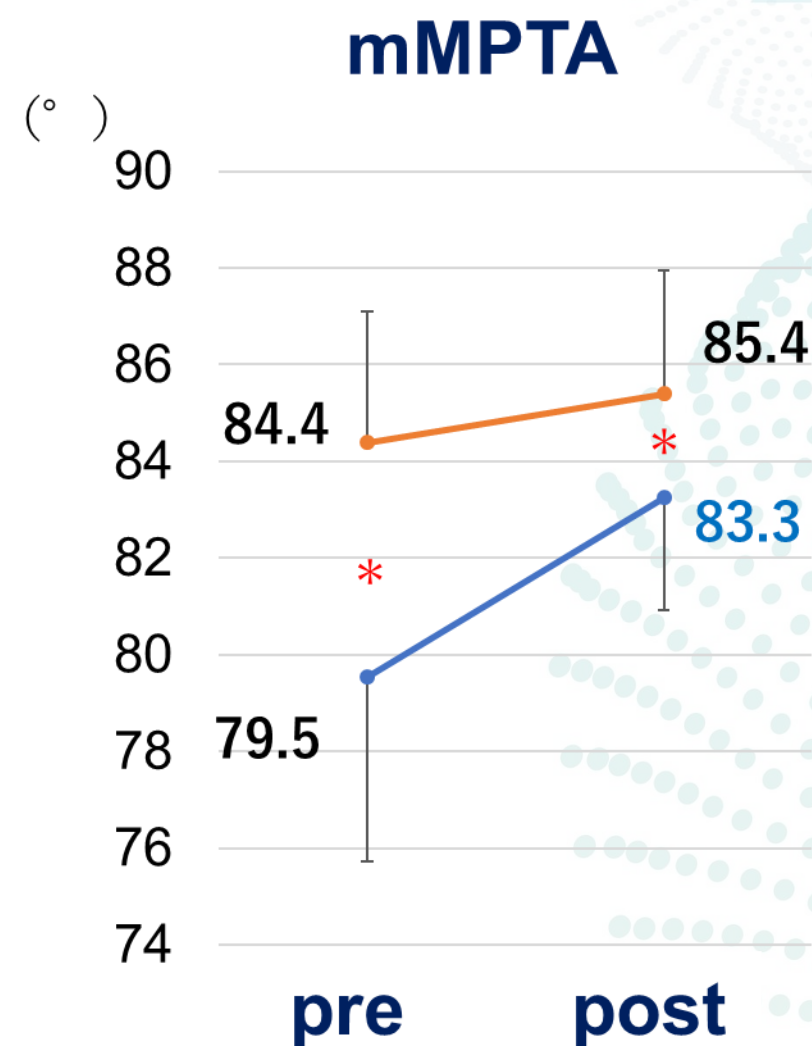
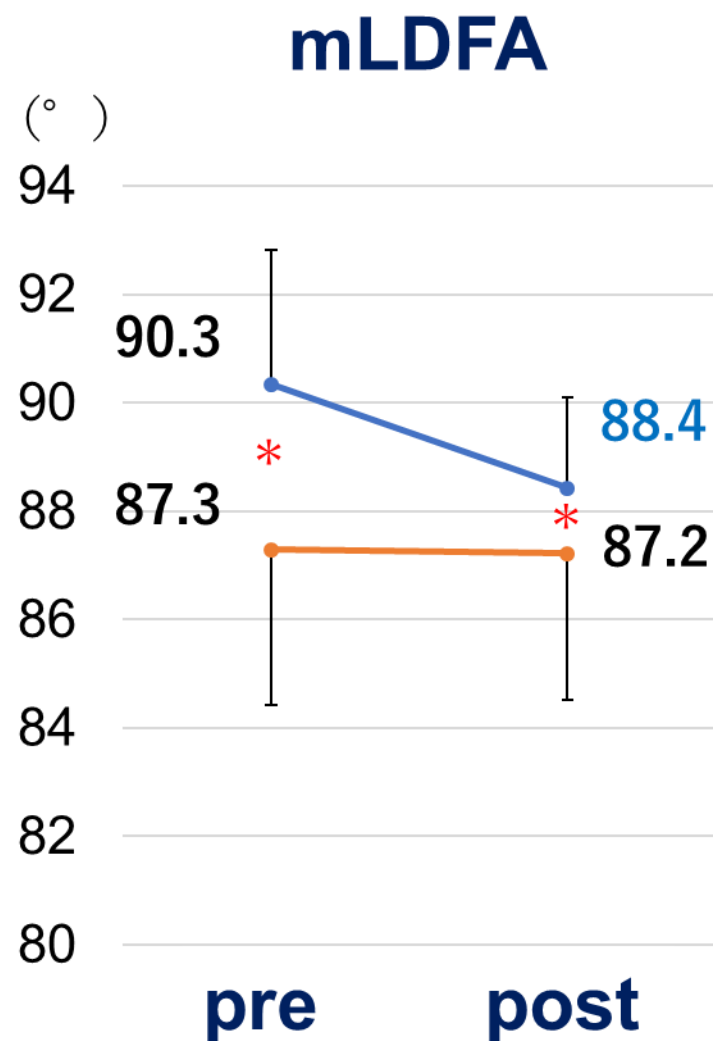
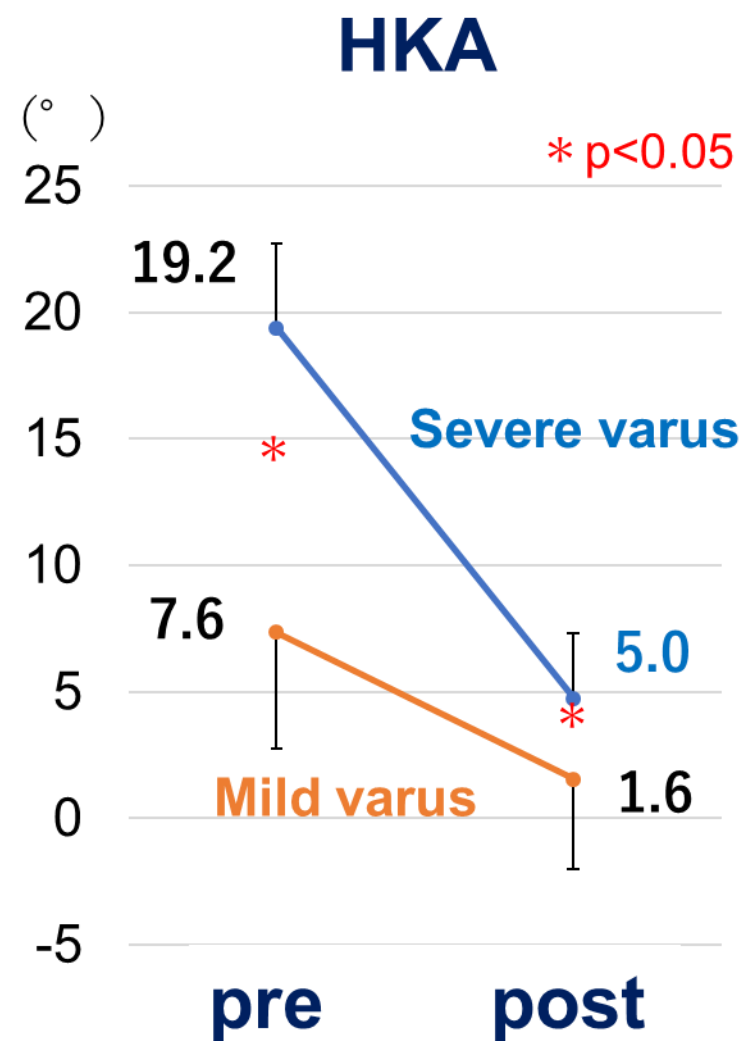


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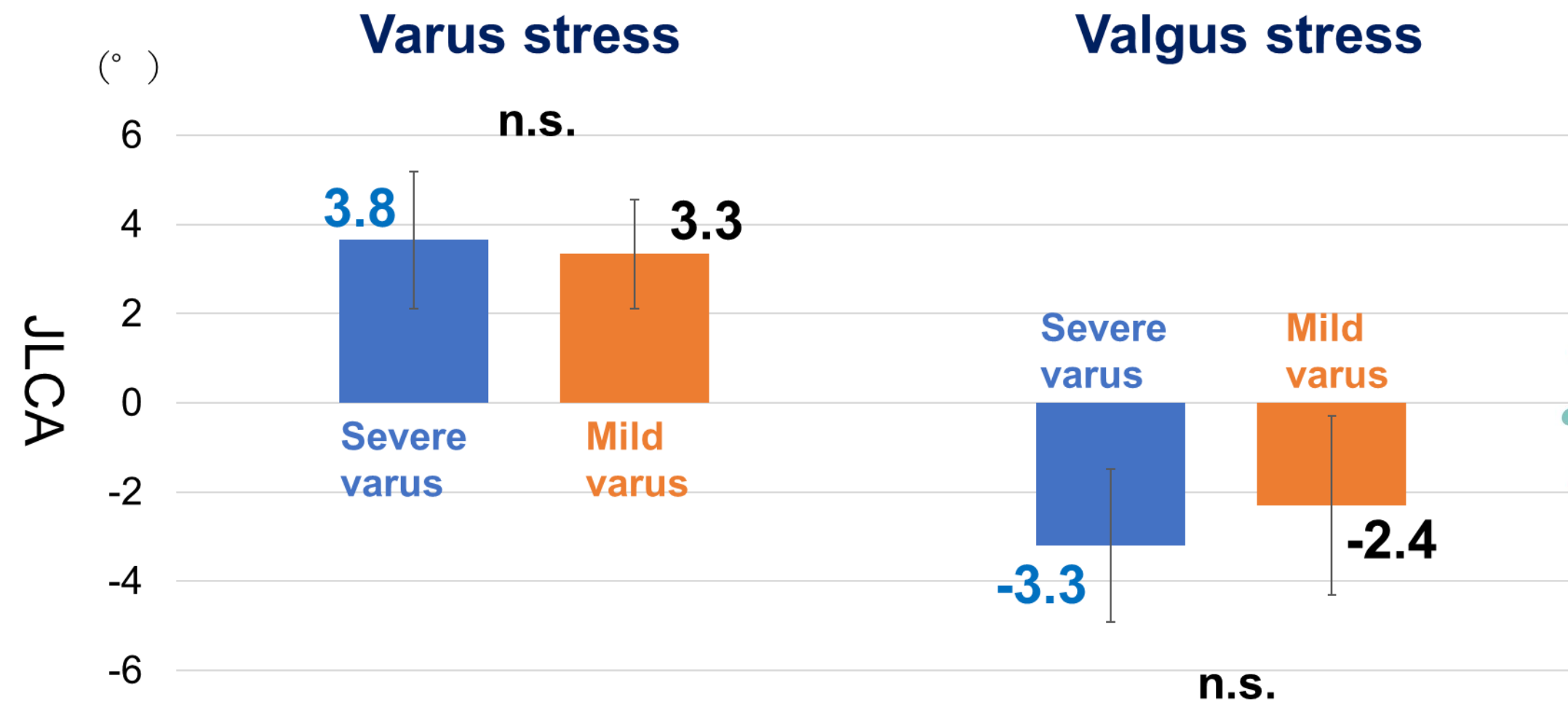


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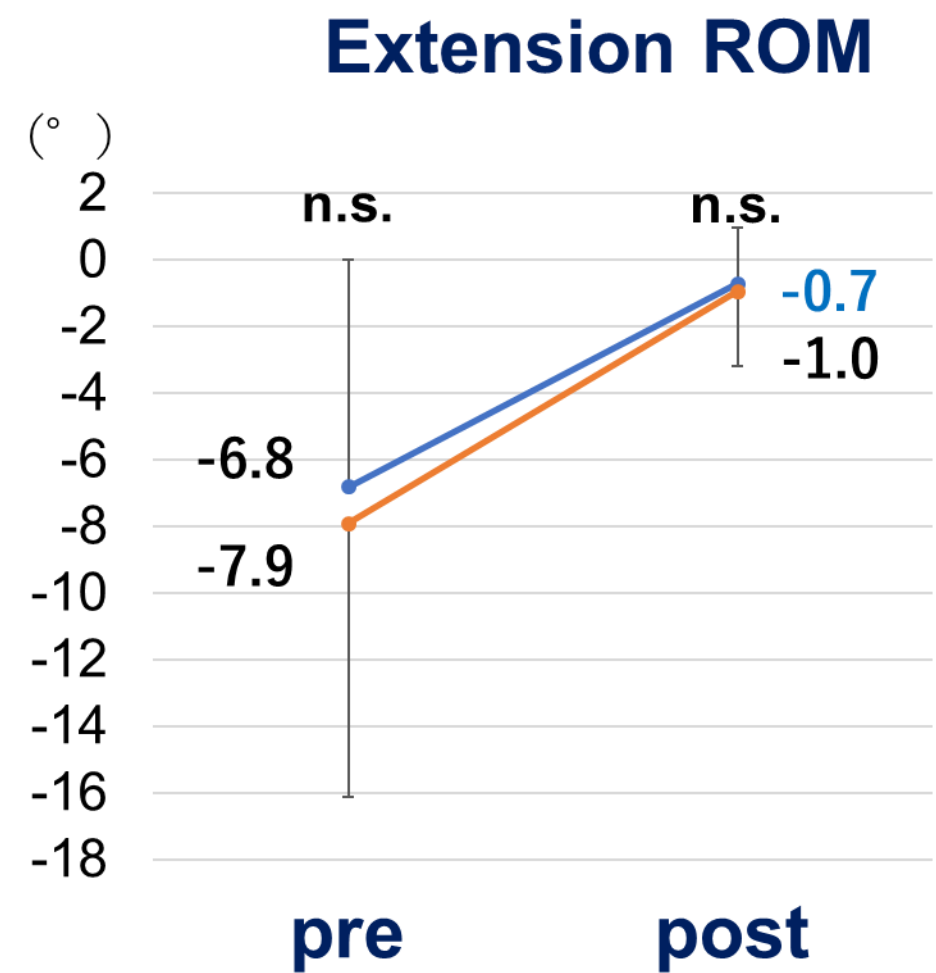
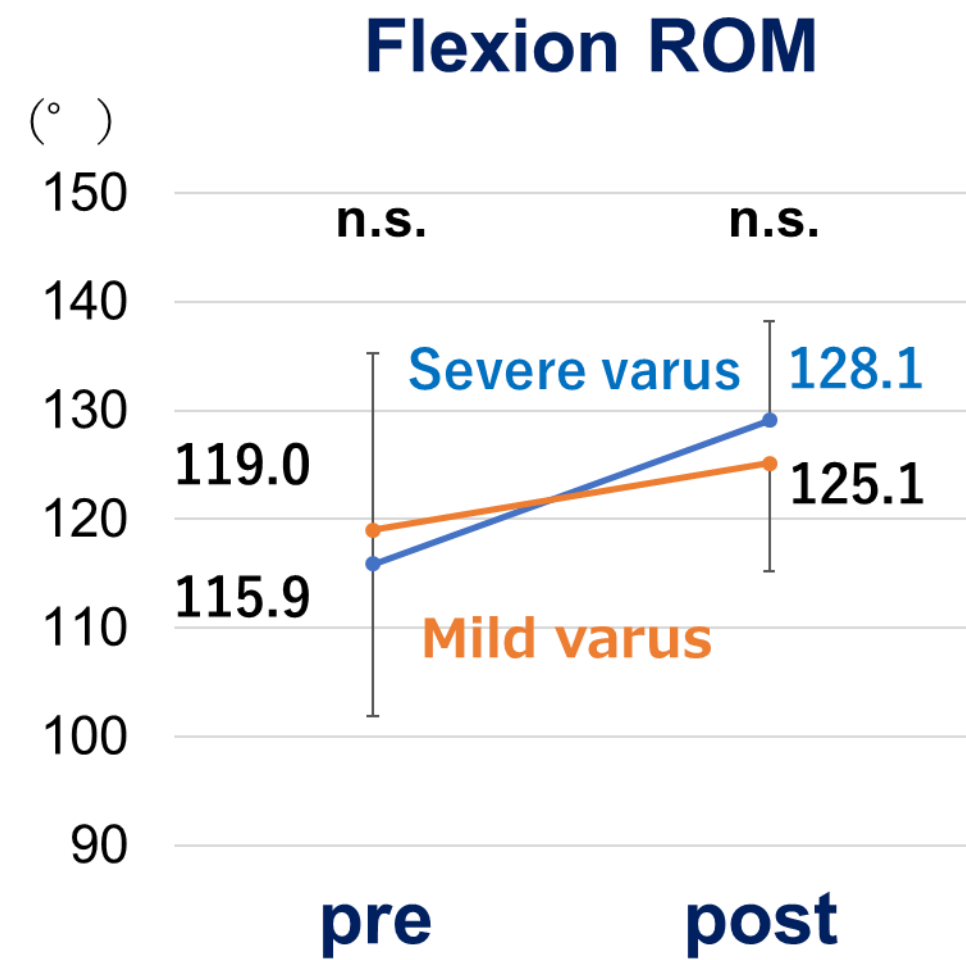
Result 2. Preoperative and postoperative alignment



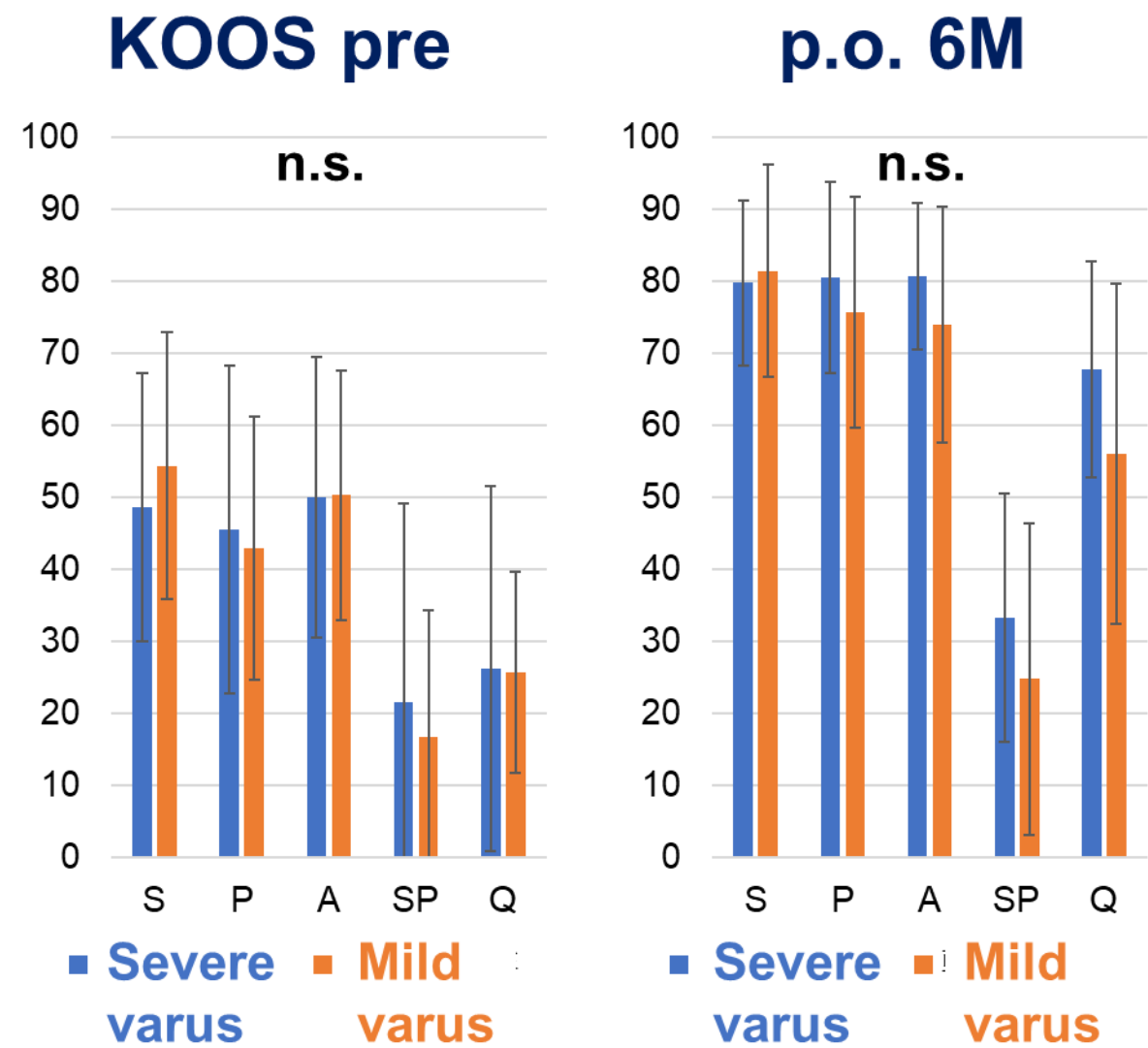
Result 3. Varus-valgus laxity in extension



Result 4. Clinical results



Result 4. Clinical results



	Severe varus (29knees)	Mild varus (93 knees)	
infection	0	0	n.s.
Pulmonary embolism	0	0	n.s.
loosening /sinking	0	0	n.s.
reoperation	0	2 (patellar disloc.)	n.s.

KA-TKA for severe varus deformity

- **Restoring the preoperative varus alignment**

Postoperative HKA: var 5.0° mL DFA 88.4° mMPTA 83.3

- **Superior varus-valgus stability in extension**

Varus laxity 3.9° valgus laxity 3.3°

- **No implant loosening** during an average 3 years follow-up

- **Excellent range of motion and functional scores**

, comparable to a mild varus knee

References

Riviere C, et al. *Orthop Traumatol Surg Res.* 2017
Bellemans et al. *Clin Orthop Relat Res.* 2011
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