

Robotic-arm assisted total knee arthroplasty is associated with improved early functional recovery and reduced time to hospital discharge compared with conventional jig-based total knee arthroplasty: a prospective cohort study

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Goal of study

To compare early postoperative functional outcomes and time to hospital discharge between conventional jig-based total knee arthroplasty (TKA) and robotic-arm assisted TKA.

Materials and methods

- Prospective comparative cohort study
- 40 consecutive patients undergoing conventional jig-based TKA followed by 40 consecutive patients receiving robotic- arm assisted TKA
- No clinical differences in baseline characteristics between the two groups
- All surgical procedures were performed by a single surgeon
- Same surgical exposure (medial parapatellar approach)
- Same implant system (Triathlon PS)
- Standardized postoperative inpatient rehabilitation
- Inpatient functional outcomes and time to hospital discharge were collected in all study patients classification system







Type 6	Uninvolved soft tissues (10 points)	
Type 5	Planned soft tissue release. Tissues beyond release uninjured (8 points)	
Type 4	Soft tissue confusion. Superficial layer involvement only. No involvement of deeper layers. No fibrillation. (7 points)	
Type 3	Soft tissue fibrillation (macroscopic superficial to partial thickness tissue damage) (5 points)	
Type 2	Soft tissue cleavage (partial to full thickness soft tissue fragmentation) (3 points)	
Type 1	Complete unintentional knee defunctioning due to superficial MCL, LCL injury, partial or complete patella tendon injury	

Fig. 1
Intraoperative photographs showing soft tissue injury for each grade of MASTI classification system. No type 6 injuries were observed in this study. LCL, lateral collateral ligament; MCL, medial collateral ligament.

- **Note:** The proposed MASTI classification system is a reproducible grading scheme for describing iatrogenic bone and soft tissue injury in TKA

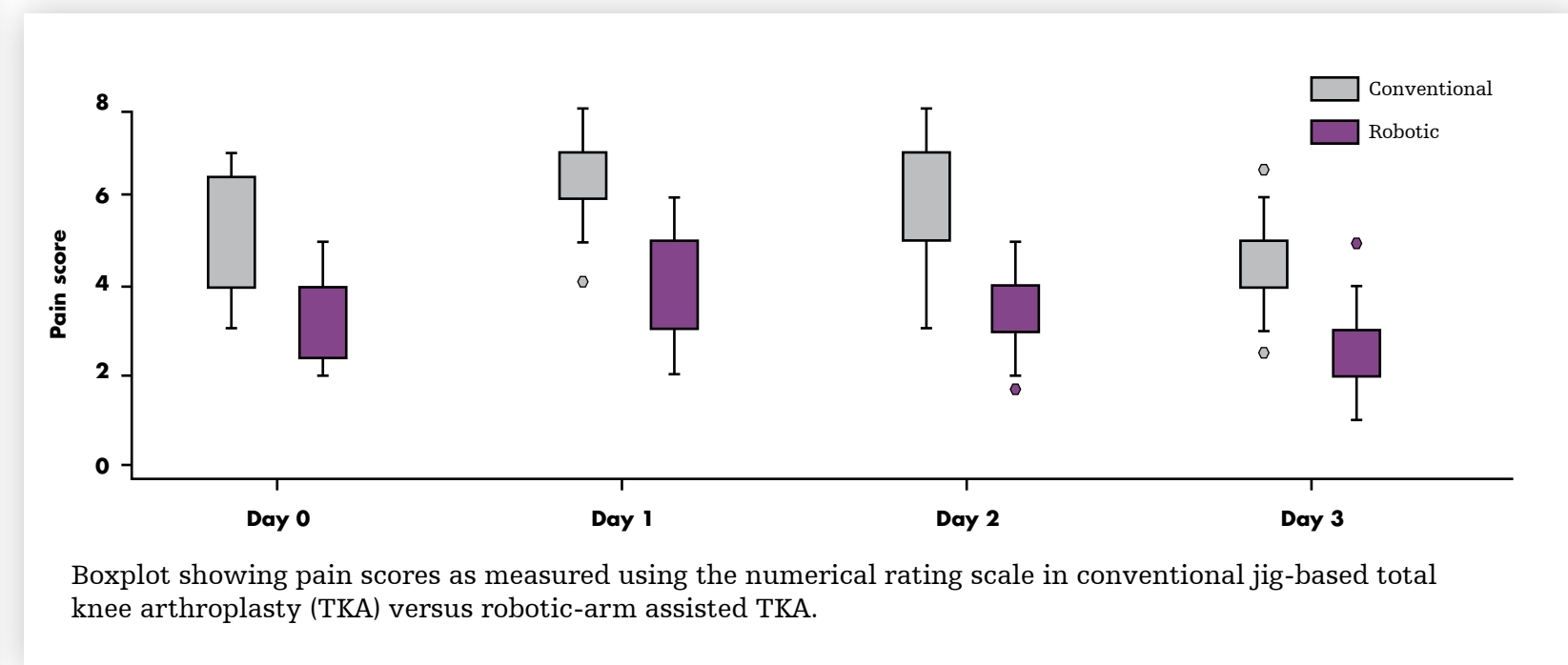
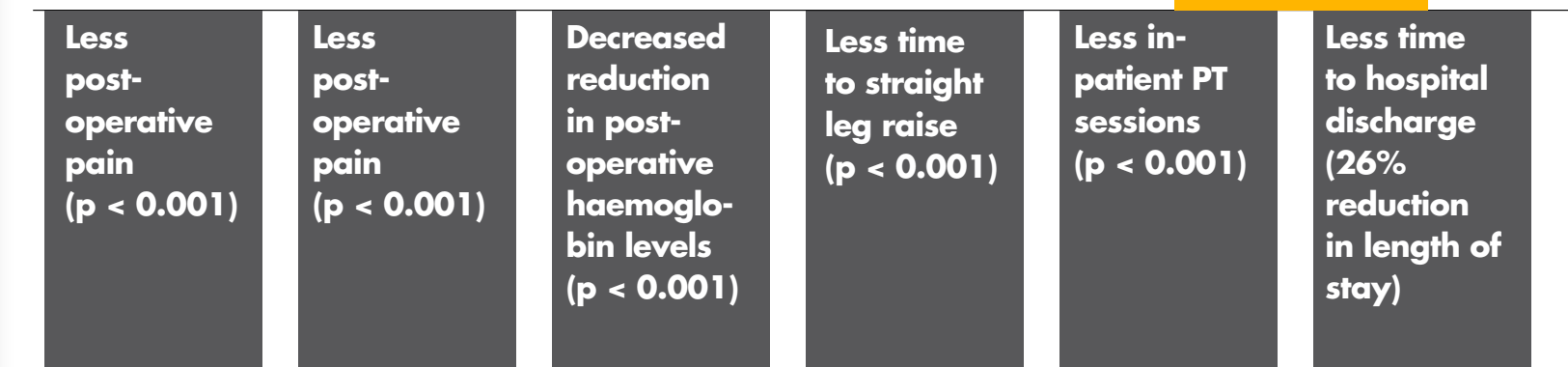
MASTI classification	Description of soft tissue reservation	Points	Description
Grade A	Excellent	>34 points	Iatrogenic injury to only 1 zone with relative soft tissue preservation of the other zones
Grade B	Average	25-33 points	Minimal iatrogenic injury to ≥2 zones with relative soft tissue preservation of the other zones
Grade C	Poor	<24	Significant iatrogenic soft tissue injury to ≥3 zones
Grade D	Defunctioned knee	0	Injury to superficial MCL ± LCL ± extensor mechanism defunctioning the knee

Table 1
Description of the MASTI Classification System.

Results

When comparing robotic-arm assisted TKA to conventional instrumented, robotic-arm assisted TKA was associated with:

Improved maximum knee flexion at discharge (p < 0.001) compared with conventional jig-based TKA



Conclusion

Robotic-arm assisted TKA was associated with decreased pain, improved early functional recovery and a reduced time to hospital discharge compared with conventional jig-based TKA.

References:
B.Kayani, S. Konan, J. Tahmassebi, J. R. T. Pietrzak, F. S. Haddad. Robotic-arm assisted total knee arthroplasty is associated with improved early functional recovery and reduced time to hospital discharge compared with conventional jig-based total knee arthroplasty. The Bone and Joint Journal. 2018; 100-B:930-7.

B.Kayani, S. Konan, J. Tahmassebi, J. R. T. Pietrzak, F. S. Haddad. Iatrogenic Bone and Soft Tissue Trauma in Robotic-Arm Assisted Total Knee Arthroplasty Compared With Conventional Jig-Based Total Knee Arthroplasty: A Prospective Cohort Study and Validation of a New Classification System. The Journal of Arthroplasty March (2018) 1e6-18.

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