

Comparison of Clinical Outcomes between High Tibial Osteotomy and Total Knee Arthroplasty in Older Patients with Severe Osteoarthritis

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Competing interest

The authors declare that they have no competing interests



Introduction 1

- ✓ Clinical outcomes of high tibial osteotomy (HTO) in older patients remain controversial

Goshima K, KSSTA, 2017

Schuster P, AJSM, 2018

Jin C, Arthroscopy, 2020

Efe T, BMC Musculoskeletal Disorders, 2011

- ✓ Clinical outcome

HTO \equiv Total knee arthroplasty (TKA) (no criteria: age, K-L grade)

Unicompartment knee arthroplasty > HTO (65-74 years, K-L ≥ 3)

Matsumoto K, J Orthop Surg (Hong Kong, 2020

Okimura S, Arch Orthop Trauma Surg, 2023

Clinical outcomes of HTO in older patients compared with TKA in early older patients with severe OA remain unclear



Introduction 2

Objectives

This study aimed to compare the clinical outcomes of HTO and TKA in early older patients with severe OA

Hypothesis

Satisfactory clinical outcomes could not be attained with HTO in early elderly patients with severe OA



Methods

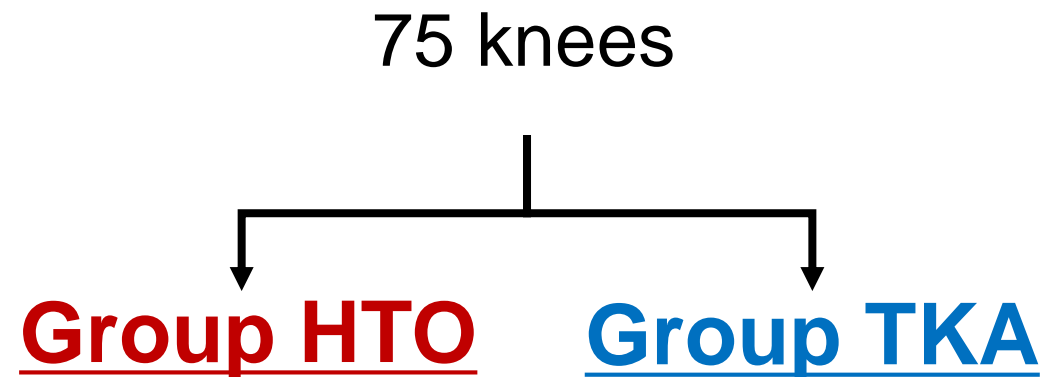
Patients: underwent HTO or TKA for medial knee OA in our hospital between 2011 and 2022 were enrolled

Inclusion criteria

- (1) Age 65-74 years (early older)
- (2) Kellgren-Lawrence (K-L) grade: 4
- (3) Minimal follow-up of 2 year postoperatively

Exclusion criteria

- (1) Inflammatory arthritis
- (2) Symptomatic lateral compartment
- (3) Revision cases





Clinical evaluations 1

① Demographic data

- ✓ Age
- ✓ Sex
- ✓ Body mass index (BMI)
- ✓ Follow-up (F/U) period

② Radiographic data

- ✓ Femoral tibial angle (FTA)
- ✓ % of the mechanical axis (%MA)
- ✓ Medial proximal tibial angle (MPTA)
- ✓ Joint line convergence angle (JLCA)
- ✓ Posterior tibial slope (PTS)



Clinical evaluations 2

③ Clinical outcomes

- ✓ Knee Injury and Osteoarthritis Outcome Score (KOOS) at final F/U
 - ✓ Minimal clinically important difference (MCID)
 - ✓ Patient-acceptable symptomatic state (PASS)
- } achievement rate

HTO/TKA	MCID	PASS
Symptoms	15.1/9	71.4/81
Pain	15.4/12	72.2/85
ADL	17/10	77.9/83
Sports	11.2/9	40/NA
QOL	16.5/14	56.3/66

Statistical analysis

- ✓ t-test
- ✓ Paired t-test
- ✓ chi-squared test

Statistical significance was set at $P < 0.05$ (*)

Jacquet C, KSSTA, 2021

Migliorini F, KSRR, 2024

Patel S, J Cartilage Joint Preservation, 2021



Result ~Demographic data

Mean	Group HTO (n=35)	Group TKA (n=40)	P value
Age	69.1	71.1	<0.01
Sex (M/F)	11/24	11/29	0.91
BMI (kg/m ²)	27.6	28.0	0.72
F/U period (m)	60.3	54.7	0.48



Conversion to TKA: 3 patients
Revision osteotomy by hinge fracture: 2 patients



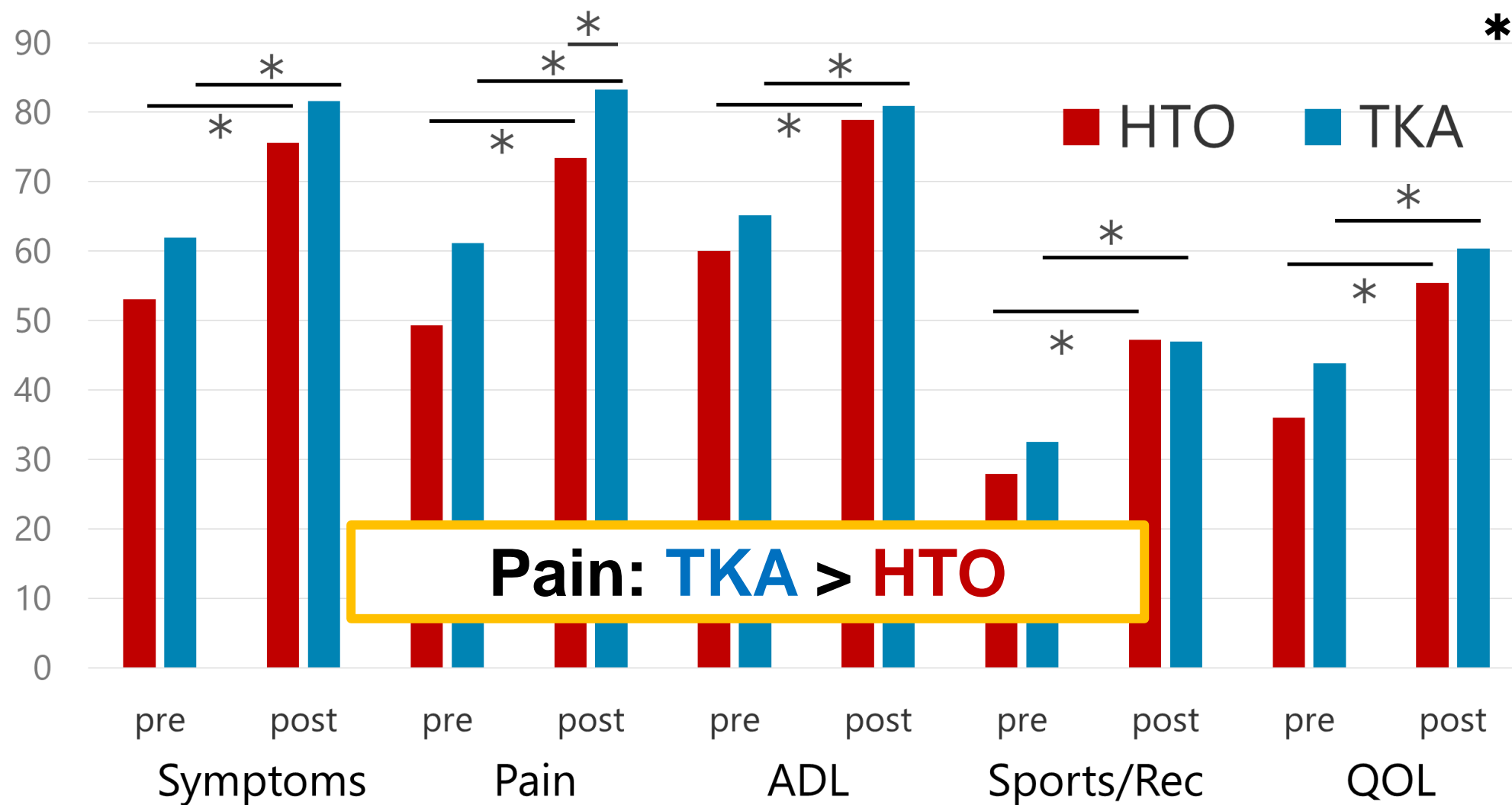
Result ~Radiographic data

Mean Pre/post-operative	Group HTO (n=35)	Group TKA (n=40)	P value
FTA (°)	183.1/172.2	185.6/175.4	0.03/0.01
%MA (%)	8.6/53.5	0.8/44.6	0.12/0.02
MPTA (°)	84.4/93.4	82.2/88.7	0.01/0.01
JLCA (°)	5.2/3.7	5.2/0.4	0.92/0.01
PTS (°)	8.0/7.8	7.7/2.9	0.74/0.01



Result ~KOOS

*: $p < 0.05$





Result ~MCID/PASS

		Group HTO (n=35)	Group TKA (n=40)	P value
MCID	Symptoms	45.7	75.0	0.02
	Pain	57.1	67.5	0.49
	ADL	42.9	57.5	0.30
	Sports	54.3	50.0	0.89
	QOL	51.4	57.5	0.77
PASS	Symptoms	57.1	60.0	0.99
	Pain	65.7	45.0	0.12
	ADL	54.3	45.0	0.57
	Sports	62.9	47.5	0.18
	QOL	65.7	47.5	0.18

MCID Symptoms : TKA > HTO



Discussion

Previous study

- ✓ Influence of age on HTO remains controversial

Guarino A, Orthop Surg, 2023

Yabuuchi, OJSM, 2023

- ✓ Severe OA is a risk factor for poor clinical outcomes after HTO

Ekeland A, Knee, 2017

Kuwashima U, Knee, 2021

- ✓ Satisfaction (ascending stairs), KOOS Symptoms/Pain: TKA>HTO

Matsumoto K, J Orthop Surg (Hong Kong, 2020

This study

- ✓ Pain: **TKA**>HTO

- ✓ MCID (Symptoms): **TKA**>HTO

HTO may have limitations in older patients with K–L grade 4



Conclusion

- ✓ KOOS Pain scores and MCID achievement rate for KOOS
Symptoms after TKA were superior to those after HTO in early older patients with severe OA at a mean follow-up of 54 months.
- ✓ Our findings suggest that HTO should be limited in older patients with severe OA.