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Medial Degenerative Disease of the Knee Without Radiographic Osteoarthritis is a Good Indication for Medial Open Wedge High Tibial Osteotomy

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Faculty Disclosure Information

- Nothing to disclose

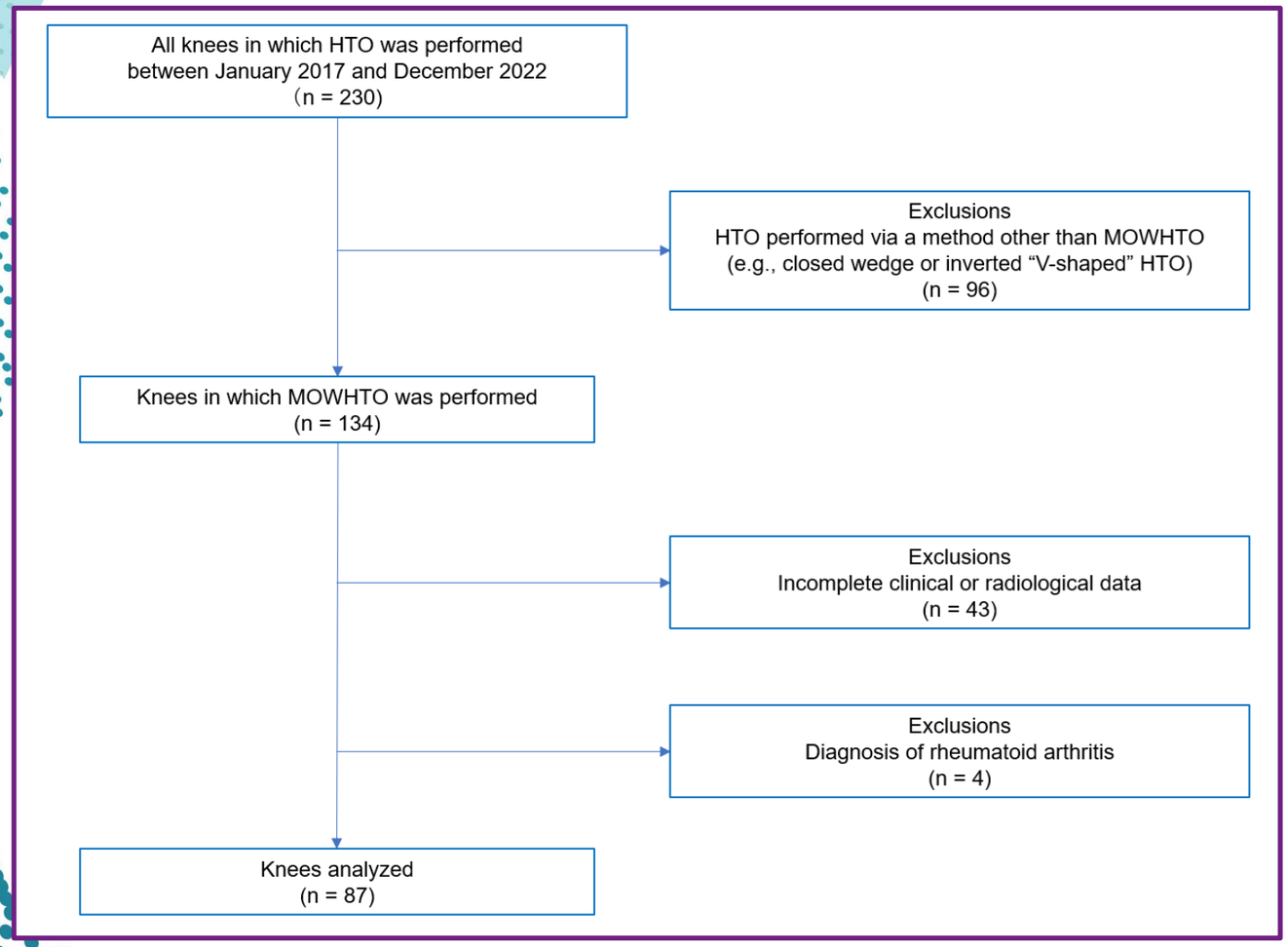
Background

- Early OA, Kellgren–Lawrence (K/L) grade of 0 or 1
- Still a lack of consensus on the surgical treatment of early OA with varus malalignment
- One of the choices is medial open-wedge high tibial osteotomy (M-OWHTO)
- While MOWHTO has favorable outcomes, it is uncertain whether it is effective for early OA

Purpose

- To evaluate the clinical results of MOWHTO in patients with early OA and varus malalignment
- We hypothesized that the improvement in clinical outcomes in patients with early OA would be similar to those in patients with established OA

Materials and Methods



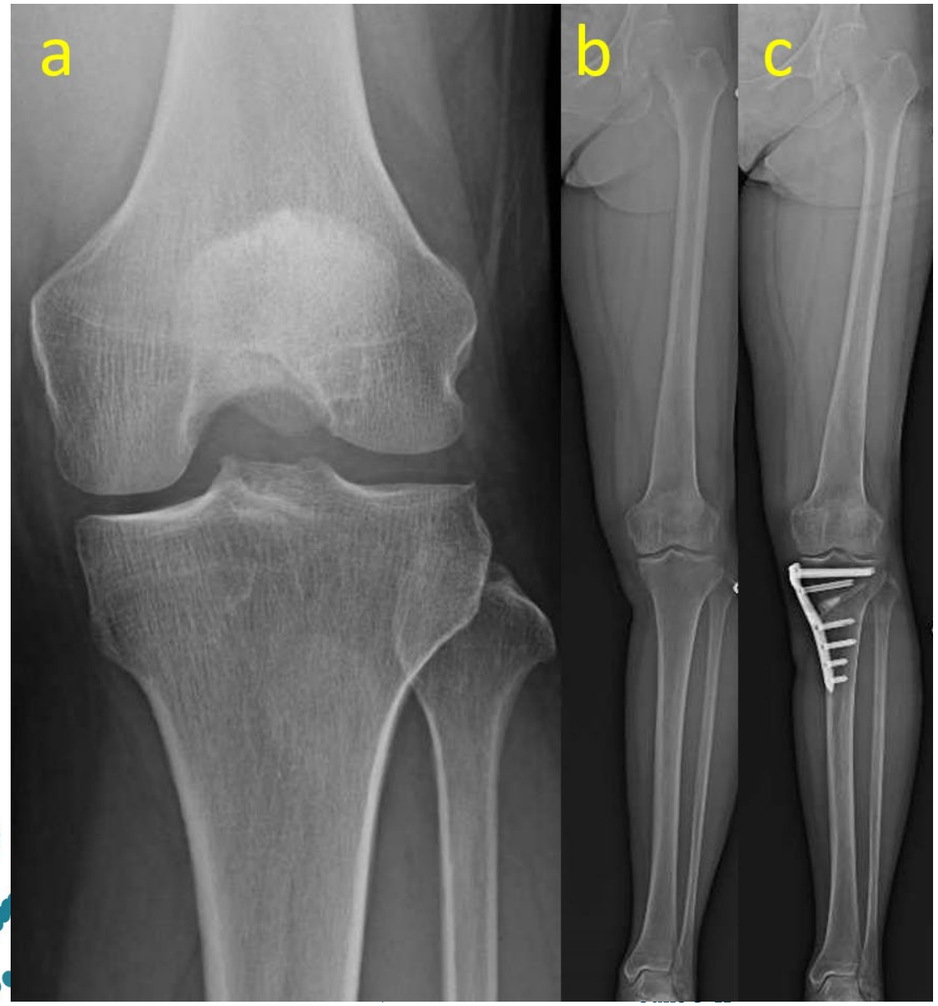
Retrospective analysis of 87 patients in whom varus malalignment corrected by MOWHTO

Materials and Methods

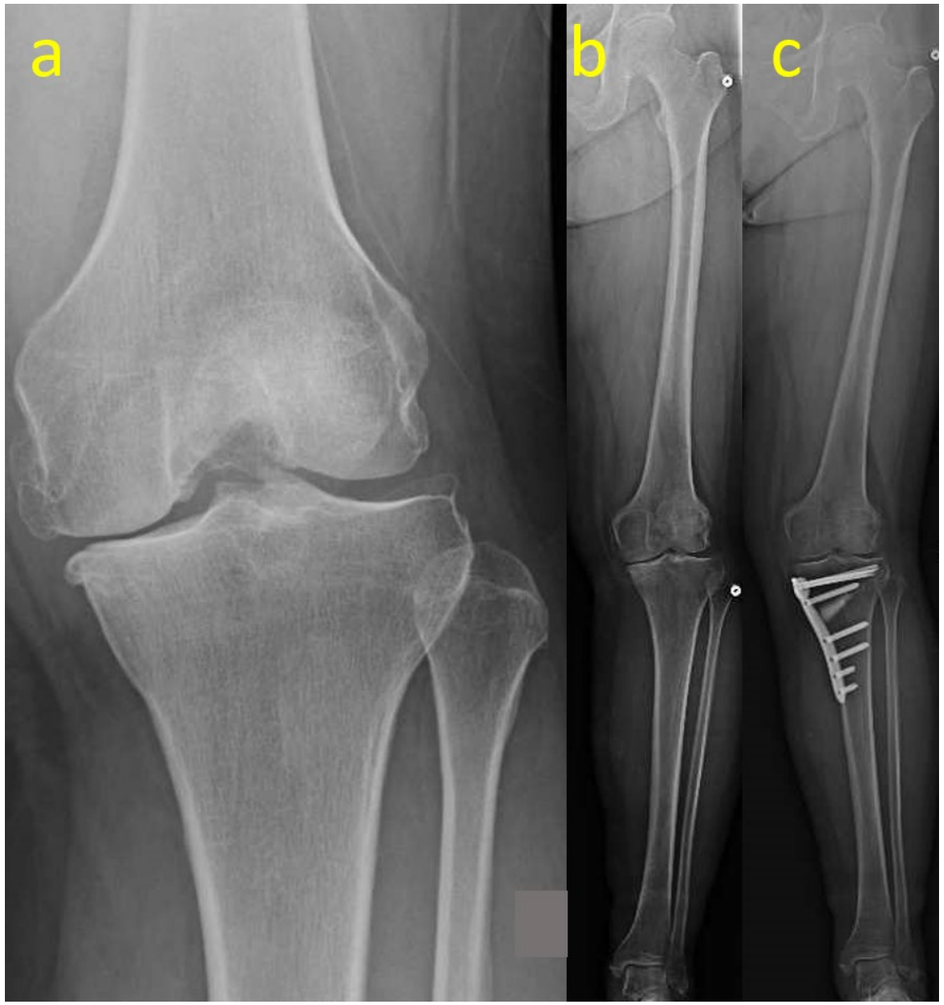
- Early OA was defined as K/L grade 0 or 1 and established OA as K/L grade ≥2
- Valgus alignment was defined as an HKA angle of <180° and varus alignment as an HKA angle of >180°
- MOWHTO was performed via biplanar osteotomy using a long locking plate (TriS, Olympus Terumo Biomaterials, Tokyo, Japan) aiming for a postoperative weight-bearing axis at a location 62.5% lateral to the transverse diameter of the tibial plateau
- PROMs, Forgotten Joint Score-12 (FJS-12), and Knee Injury and Osteoarthritis Outcome Score (KOOS)

Materials and Methods

Early OA



Established OA



(a) Anteroposterior radiograph before MOWHTO. (b) Whole-leg standing radiograph before MOWHTO. (c) Whole-leg standing radiograph after MOWHTO.

Results

Table 1 Demographic and radiological data according to stage of osteoarthritis

Parameter	Early OA (n = 38)	Established OA (n = 49)	*p*-value
Age at surgery (years), median [range]	55 [40–73]	61 [45–78]	**0.02**
Male sex, n (%)	17 (44.7)	19 (38.8)	0.66
Body mass index[a], median [range]	25.6 [18.3–31.8]	25.1 [19.1–41.0]	0.86
Preoperative K/L grade			**< 0.0001**
0	1	0	
1	37	0	
2	0	28	
3	0	18	
4	0	3	
Preoperative ROM (°), median [range]	140 [110–150]	135 [75–150]	0.07
Postoperative ROM (°), median [range]	145 [130–150]	140 [125–150]	0.06
Preoperative HKA (°), median [range]	183.4 [180.6–187.8]	184.3 [180.2–187.0]	0.13
Postoperative HKA (°), median [range]	177.1 [175.2–180.0]	176.6 [174.9–179.5]	0.12
Preoperative MPTA (°), median [range]	83.4 [78.1–87.6]	83.8 [78–87.1]	0.26
Postoperative MPTA (°), median [range]	90.8 [86.4–95.3]	91.8 [88.1–95.4]	0.11
Preoperative LDFA (°), median [range]	87.2 [84.5–90.8]	87.2 [84.1–90.6]	0.89
Duration of follow-up (months), median [range]	24.5 [13–65]	24.0 [12–60]	0.45
Concurrent arthroscopic procedures, n (%)			0.08
Meniscus repair	14 (36.9)	10 (20.4)	
Meniscus resection	24 (63.1)	39 (79.6)	

Bold values denote statistically significant differences between the groups

HKA, hip-knee-ankle angle; K/L, Kellgren-Lawrence; LDFA, lateral distal femoral angle; MPTA, mechanical medial proximal tibial angle; OA, osteoarthritis; ROM, range of motion

[a]Calculated as kg/m^2

Patients in the established OA group (n = 49) were significantly older than those in the early OA group (n = 38) (p = 0.02)

Results

Table 2 Patient-reported outcome measures according to stage of osteoarthritis

Patient-reported outcome measure	Early OA (n = 38)	Established OA (n = 49)	*p*-value
Preoperative			
FJS-12	17.5 ± 14.0	20.9 ± 16.4	0.31
KOOS (Pain)	49.9 ± 17.0	56.2 ± 16.6	0.08
KOOS (Symptoms)	58.6 ± 20.1	56.8 ± 18.4	0.50
KOOS (ADL)	61.8 ± 16.7	70.7 ± 16.6	**0.02**
KOOS (Sports)	27.8 ± 21.6	33.7 ± 23.2	0.27
KOOS (QoL)	25.8 ± 18.5	31.3 ± 19.5	0.21
Postoperative			
FJS-12	50.9 ± 28.3	60.8 ± 25.9	0.10
KOOS (Pain)	83.3 ± 13.8	88.6 ± 13.1	**0.04**
KOOS (Symptoms)	84.1 ± 15.9	86.5 ± 12.6	0.66
KOOS (ADL)	86.2 ± 14.3	91.0 ± 10.6	0.06
KOOS (Sports)	62.1 ± 27.0	73.2 ± 22.2	0.06
KOOS (QoL)	65.9 ± 23.8	70.6 ± 22.3	0.35
Improvement			
ΔFJS-12	33.4 ± 27.6	39.9 ± 23.3	0.22
ΔKOOS (Pain)	33.3 ± 17.5	32.4 ± 16.6	0.78
ΔKOOS (Symptoms)	25.5 ± 20.6	29.6 ± 19.6	0.25
ΔKOOS (ADL)	24.3 ± 14.3	20.3 ± 14.9	0.23
ΔKOOS (Sports)	34.2 ± 27.1	39.2 ± 21.5	0.42
ΔKOOS (QoL)	40.1 ± 25.3	39.4 ± 20.7	0.93

Data are presented as the mean ± standard deviation. Bold values denote statistically significant differences between the groups

ADL, activities of daily living; FJS-12, Forgotten Joint Score; KOOS, Knee Injury and Osteoarthritis Outcome Score; OA, osteoarthritis; QoL, quality of life

No significant difference between the groups in improvements in PROMs

Discussion

- K/L grade has limited reproducibility and includes terminology “doubtfully” and ”possible” in regard to joint space narrowing, which are inherently.

- Our findings indicate that MOWHTO can be considered if there are persistent symptoms in the varus knee rather than using a cut-off K/L grade to determine whether surgery is indicated.

- On the other hand, the potential risks of overdiagnosis and overtreatment must be acknowledged.

- Further research is needed to determine the exact role of HTO in meniscus or cartilage injury.

Discussion (Limitations)

- Retrospective study
- Potential effect of concurrent meniscus surgery is unknown
- Sample size was small
- The duration of follow-up was relatively short
- Only the K/L scale was used to grade the severity of OA

Conclusions

- The improvement in clinical outcomes in patients with early OA following MOWHTO was similar to those with established OA
- Medial degenerative disease of the knee without radiographic osteoarthritis is a good indication for MOWHTO

References

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