

Comparison of outcomes of High Tibial Osteotomy using two principles of pre-operative planning

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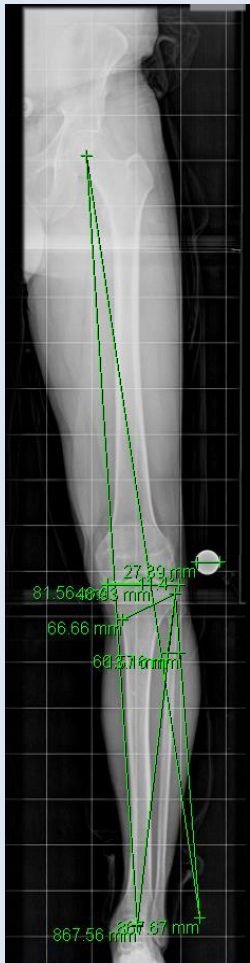
Background and Objective

- Indication for HTO: Young patient with medial compartment OA and varus alignment of knee
- Ideal WB axis postop is not universally agreed. However, valgus alignment is desirable to unload medial compartment.
- Careful pre-operative planning is required to obtain a weight bearing axis (Miculikz point) within the desired 50 to 70 % of tibial plateau
- Severe tibia valgus (mPTA>93) can lead to abnormal shear forces in the joint and make future TKR difficult
- **Objective** of this study was to compare results of HTO by two different principles of pre-op planning.

Patients and Methods

- Retrospectively analysis of total 100 patients (109 knees).
- **Surgeon 1** (67 pts, 71 knees) used Miniaci method with focus on achieving Mikulicz point at 60-62.5 %.
- **Surgeon 2** (33 pts, 38 knees) employed planning software (TraumaCad) with a conservative approach keeping mMPTA < 93 degrees to avoid valgus at proximal tibia.
- Mikulicz point, mMPTA and JLCA were compared on long leg radiographs.
- Functional outcomes were determined using Oxford Knee Score (OKS), KOOS and EQ5D5L.

Group 1 pre-op

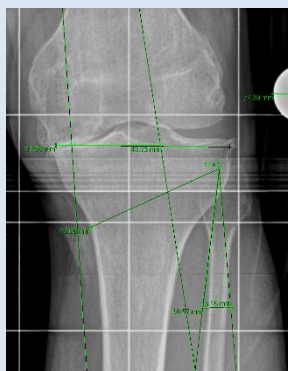


Group 1 post-op



MEASUREMENT TOOLS INFORMATION
High Tibial Osteotomy
 High Tibial Osteotomy = 1°
Limb Alignment Analysis (Unilateral)

Angle(°)	Pre	Normal	Post
mLPFA	89	85-90	
mLDFA	88	85-90	
mMPTA	95	85-90	
mLDTA	83	86-92	
JLCA	4	0-2	
Length (mm)	Pre	Normal	Post
MAD	9		
Femur	422		
Tibia	334		
Total Length	759		



Group 2 pre-op



MEASUREMENT TOOLS INFORMATION
Limb Alignment Analysis (Unilateral)

Angle(°)	Pre	Normal	Post
mLPFA	85	85-90	88
mLDFA	88	85-90	88
mMPTA	83	85-90	93
mLDTA	91	86-92	90
JLCA	2	0-2	2
Length (mm)	Pre	Normal	Post
MAD	26		88
Femur	446		443
Tibia	346		354
Total Length	797		804

Group 2 post-op

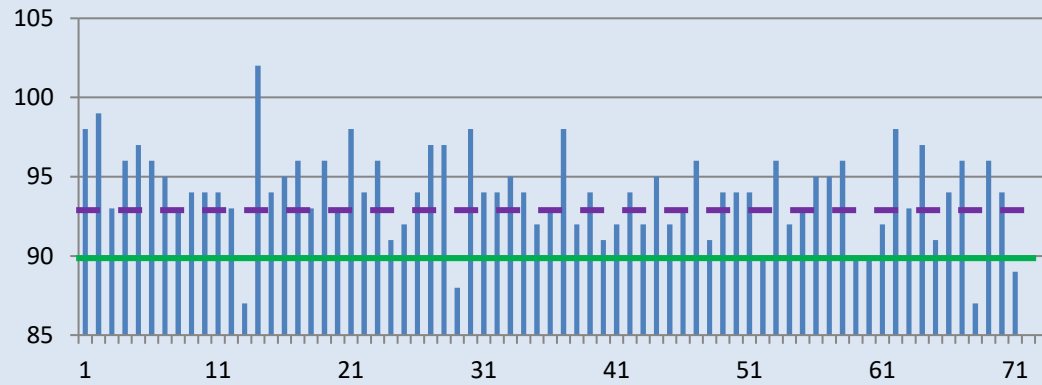


MEASUREMENT TOOLS INFORMATION
Limb Alignment Analysis (Unilateral)

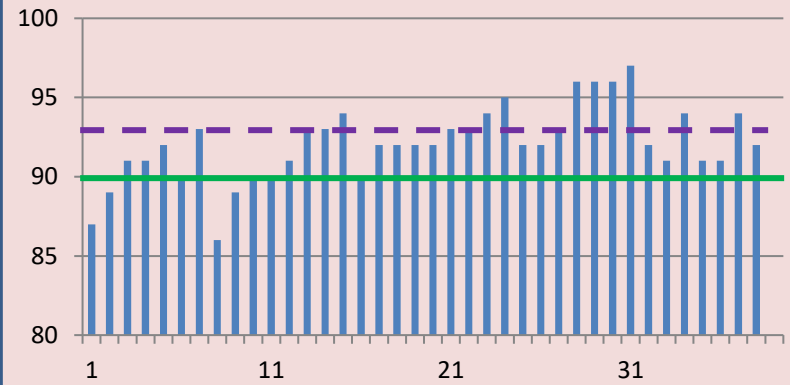
Angle(°)	Pre	Normal	Post
mLPFA	90	85-90	
mLDFA	88	85-90	
mMPTA	90	85-90	
mLDTA	90	86-92	
JLCA	3	0-2	
Length (mm)	Pre	Normal	Post
MAD	7		
Femur	445		
Tibia	348		
Total Length	798		
Total Length	798		

Results

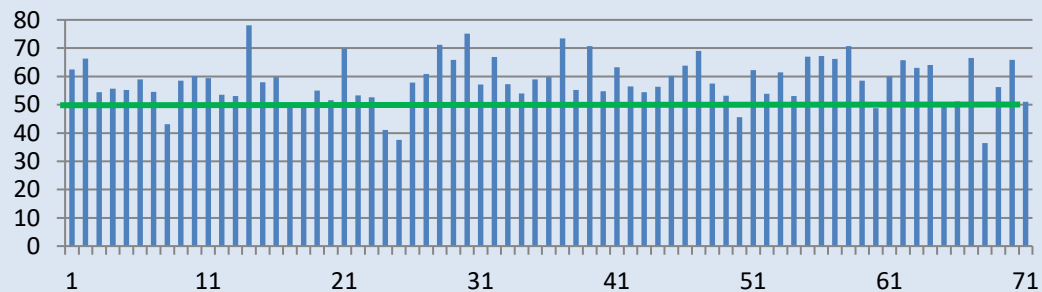
mMPTA postop Group 1 (mean 93.95)



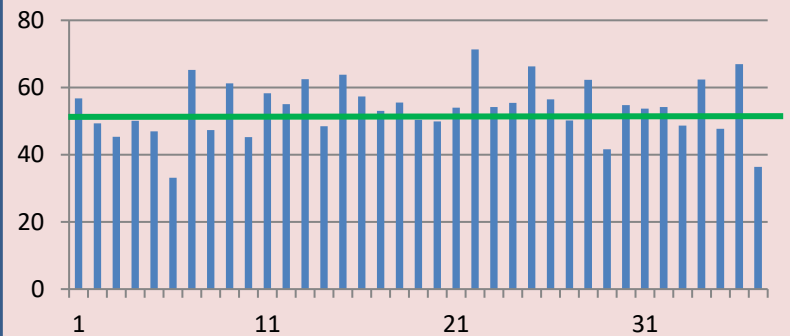
mMPTA Group 2 (mean 92.13)



Mikulicz Point postop Group 1 (mean 58.45)



Mikulicz Group 2 (mean 53.81)



JLCA

	Group 1 pre-op	Group 1 post op	P value	Group 2 pre-op	Group 2 post-op	P value
JLCA	3.61	2.97	0.15	3.39	2.40	0.0049
mMPTA		93.95 (SD 2.76)			92.13 (2.37)	0.0008

Functional Outcomes

	Group 1 pre-op	Group 1 post op	P value	Group 2 pre-op	Group 2 post-op	P value
OKS	42.84	68.99	0.0001	43.15	65.05	0.03
KOOS	23.24	36.44	0.0001	23.71	32	0.0008
EQ5D 5L	0.57	0.73	0.0001	0.56	0.70	0.08

	Group 1 post-op (n=41)	Group 2 post op (n=14)	P value
OKS	68.99	65.05	0.67
KOOS	36.44	32	0.83
EQ5D 5L	0.73	0.70	0.92

Discussion and Conclusions

- **mMPTA**

- Group 1: 93.95 (SD 2.76) in group 1 . 38% mMPTA \geq 95
- Group 2: 92.13 (SD 2.37). 15% mMPTA \geq 95

- **Mikulicz point**

- Group 1: 58.45 (SD 8.2) . 9.85 % Under-corrections and 8.45% over correction
- Group 2: 53.81 (SD 8.29). 32.4 % under-corrections and 2.7% overcorrection

- Mean **EQ5D**, **OKS** and **KOOS** improved after surgery in but there was no significant difference between groups.

- **Conclusion:**

- Principle 1 less risk of under correction and higher risk of overcorrection. High risk of valgus tibia (mMPTA>95)
 - Principle 2 higher risk of under correction, less risk of valgus tibia.
- The functional outcomes improve in patients after HTO irrespective of the technique used in pre-operative planning.