

SUPPLEMENTAL TABLES

Patient	Initial Displacement								Postoperative Displacement								Follow-up Displacement								
	rotation				translation				rotation				translation				rotation				translation				
	Dimension	x	y	z	t	x	y	z	t	x	y	z	t	x	y	z	t	x	y	z	t	x	y	z	t
		Varus	Ext. rot					Leg short		Varus	Ext. rot					Leg short		Varus	Ext. rot					Leg short	
1		-25.7	47.7	9.0	56.3	20.9	24.1	-26.9	41.7	-5.0	7.8	-13.3	15.9	11.8	-3.7	-2.1	12.6	-23.0	3.3	-28.0	35.7	8.5	-2.3	0.5	8.9
2		15.9	10.8	55.4	57.0	29.0	42.7	-16.1	54.1	0.4	0.2	-14.3	14.3	-0.7	-15.2	5.5	16.2	3.3	1.6	-8.3	9.1	-8.1	-5.8	-4.2	10.8
3		-7.2	35.6	46.4	60.1	31.4	51.3	-21.2	63.8	-1.7	-5.7	-4.1	7.3	-4.5	7.0	2.7	8.8	-	-	-	-	-	-	-	-
4		-21.4	26.0	35.8	52.1	10.6	45.8	-9.5	48.0	-15.6	8.7	-8.5	19.2	10.9	13.3	-2.3	17.4	-	-	-	-	-	-	-	-
5		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6		-60.2	47.0	-35.1	70.4	18.4	17.0	-39.4	46.7	-10.7	-5.1	-20.8	24.3	1.6	-2.7	-4.1	5.1	-10.5	-3.8	-17.5	21.0	-0.3	-0.9	-4.7	4.8
7		-29.2	-2.4	33.9	44.1	0.4	34.5	4.6	34.8	-0.7	7.4	12.2	14.4	11.1	13.3	-8.8	19.4	-0.8	7.0	12.9	14.7	9.4	13.9	-11.4	20.3
8		-4.7	5.2	13.8	15.7	2.5	7.9	-2.8	8.8	3.7	10.3	-7.8	13.6	6.4	-7.1	-9.2	13.3	6.8	8.1	-3.2	11.2	1.6	-6.1	-10.2	12.0
9		-8.3	47.8	54.0	73.9	34.9	38.1	-36.6	63.4	-17.3	-2.7	-11.6	21.2	-1.4	12.2	-1.8	12.4	-9.7	-1.3	-3.8	10.6	-5.4	12.4	-5.3	14.6
10		2.9	24.4	27.7	36.4	12.4	25.9	-28.9	40.8	-2.7	4.4	-5.1	7.1	-2.6	-6.6	-13.3	15.1	23.6	8.4	13.0	27.3	0.8	6.4	-11.4	13.1
11		-28.0	35.7	14.1	49.7	16.7	24.8	-23.6	38.1	-2.5	-18.6	7.0	19.9	-13.9	9.9	4.5	17.6	-14.0	-18.7	1.0	23.3	-17.8	12.2	3.0	21.8
12		-28.4	30.4	15.2	46.5	1.5	52.3	-36.9	64.0	-1.1	4.1	9.9	10.8	12.4	10.5	-10.0	19.1	-2.2	5.8	5.2	8.1	-0.1	4.7	2.1	5.2
13		-3.9	30.5	40.7	51.5	23.0	38.8	-17.8	48.5	-8.3	-8.9	12.7	17.1	-6.1	11.1	0.8	12.7	-6.8	-8.8	18.6	21.2	-5.9	15.1	0.8	16.2
14		-90.0	9.6	11.5	91.9	18.2	61.8	-4.8	64.6	-15.5	-14.3	9.0	22.1	-6.6	12.9	6.2	15.7	-3.1	-17.6	13.9	22.3	-13.3	11.2	-0.4	17.4
15		-34.3	48.0	31.0	72.6	27.5	51.8	-16.2	60.9	-28.9	17.4	12.2	37.1	14.1	33.6	-4.6	36.7	-37.9	11.1	1.3	39.5	9.2	34.9	-3.1	36.2
Mean		-23.0	28.3	25.3	55.6	17.7	36.9	-19.7	48.4	-7.6	0.3	-1.6	17.5	2.3	6.3	-2.6	15.9	-6.2	-0.4	0.4	20.3	-1.8	8.0	-3.7	15.1
Median		-23.6	30.5	29.8	54.2	18.3	38.5	-19.5	48.2	-3.8	2.1	-4.6	16.5	0.5	10.2	-2.2	15.4	-4.9	2.5	1.2	21.1	-0.2	8.8	-3.7	13.8
SD		27.0	17.0	23.4	18.5	11.2	15.4	13.5	15.5	9.0	10.1	11.7	7.7	8.8	12.3	6.1	7.2	15.3	10.0	13.8	10.2	8.7	11.5	5.2	8.5
CI Lower		-37.2	19.4	13.1	45.9	11.8	28.9	-26.8	40.3	-12.3	-4.9	-7.7	13.4	-2.3	-0.1	-5.8	12.1	-14.8	-6.1	-7.4	14.5	-6.7	1.5	-6.6	10.3

Patient	Initial Displacement								Postoperative Displacement								Follow-up Displacement							
	rotation				translation				rotation				translation				rotation				translation			
Dimension	x	y	z	t	x	y	z	t	x	y	z	t	x	y	z	t	x	y	z	t	x	y	z	t
CI Upper	-8.9	37.2	37.6	65.2	23.5	45.0	-12.7	56.5	-2.8	5.6	4.5	21.5	6.9	12.8	0.6	19.6	2.5	5.3	8.2	26.1	3.2	14.4	-0.8	19.9

Table S1. Displacement over time of fractures measured preoperatively, postoperatively and at follow-up. The displacement was measured in relation to the contralateral mirrored hip. A positive rotation along the y axis is an approximation of varus displacement of the head relatively to the shaft, and along the z axis a positive value represents external rotation of the distal fragment. Similarly, a negative translation along the z axis represents leg shortening.

Body and Movement	Dimension	n	Mean Bias (Δ)	SD(Δ)	Repeatability (95%)	LoA Lower	LoA Upper
Femoral head	x	13	0.01	0.33	0.66	-0.65	0.66
	y	13	-0.02	0.22	0.43	-0.44	0.41
	z	13	0.07	0.38	0.75	-0.68	0.81
	t	13	0.48	0.25	0.49	-0.02	0.97
Femoral Head	x	13	-0.05	0.19	0.37	-0.43	0.32
	y	13	-0.04	0.22	0.43	-0.47	0.38
	z	13	-0.02	0.11	0.23	-0.24	0.21
	t	13	0.26	0.17	0.34	-0.08	0.59
Spiral blade	x	13	-0.01	0.23	0.45	-0.46	0.44
	y	13	-0.03	0.12	0.23	-0.26	0.21
	z	13	0.02	0.22	0.43	-0.41	0.44
	t	13	0.31	0.10	0.20	0.11	0.51
Spiral blade	x	13	-0.02	0.09	0.17	-0.20	0.15
	y	13	0.03	0.23	0.45	-0.42	0.49
	z	13	0.02	0.13	0.26	-0.24	0.28
	t	13	0.24	0.14	0.28	-0.05	0.52

Δ = signed paired-scan difference (scan2 – scan1).

Repeatability (95%) = $1.96 \times \text{SD}(\Delta)$. LoA = $\text{mean}(\Delta) \pm 1.96 \times \text{SD}(\Delta)$.

Table S2. Detailed repeatability metrics for CTMA measurements.

For each variable we report sample size (n), **mean bias (Δ)**, **SD(Δ)**, **95% repeatability** ($1.96 \times \text{SD}[\Delta]$), and **Bland–Altman limits of agreement** ($\text{mean}[\Delta] \pm 1.96 \times \text{SD}[\Delta]$). Where indicated, we also provide **mean absolute difference ($|\Delta|$)** with its **95% CI** and the **empirical 95th percentile of $|\Delta|$** .

Notes: Δ = scan2 – scan1 (repositioned follow-up scans). **t** = Euclidean total across axes.