

Supplementary article data

Periprosthetic tibial bone mineral density changes after total knee arthroplasty

A 7-year follow-up of 86 patients

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Table 2. Mean Knee Society score (95% CI) with number of knees studied

	Baseline	3 months	1 year	2 years	4 years	7 years
Varus aligned knees, n	75	73	72	70	68	52
AKS (95% CI)	91 (84–99)	164 (157–171)	178 (172–186)	179 (172–187)	176 (168–184)	168 (160–177)
p-value compared to baseline AKS score		0.001	0.001	0.001	0.001	0.001
p-value compared between the groups		0.03	0.001	0.04	0.005	0.01
p-value compared to 3 months AKS score			0.003	0.002		
Valgus aligned knees, n	20	18	18	19	19	15
AKS (95% CI)	99 (85–113)	147 (133–161)	149 (136–164)	163 (148–177)	152 (137–167)	146 (131–161)
p-value compared to baseline AKS score		0.001	0.001	0.001	0.001	0.001

Table 3. Mean periprosthetic tibial bone mineral density, g/cm² (95% CI) in the (preoperatively) varus aligned knee group

BMD	Baseline	3 months	6 months	1 year	2 years	4 years	7 years
No. of knees studied	75	73	67	72	70	68	52
Medial metaphyseal ROI (95% CI)	1.26 (1.20–1.33)	1.20 (1.14–1.26)	1.17 (1.11–1.23)	1.16 (1.09–1.22)	1.16 (1.10–1.22)	1.14 (1.08–1.20)	1.11 (1.04–1.17)
p-value compared to baseline BMD		0.003	0.001	0.001	0.001	0.001	0.001
p-value compared to 3-month BMD						0.009	0.001
p-value compared to 6-month BMD							0.04
Lateral metaphyseal ROI (95% CI)	1.28 (1.20–1.35)	1.28 (1.21–1.35)	1.29 (1.22–1.37)	1.28 (1.21–1.36)	1.28 (1.20–1.35)	1.28 (1.20–1.35)	1.26 (1.19–1.34)
p-value compared to baseline BMD		1.000	1.000	1.000	1.000	1.000	1.000
Diaphyseal ROI (95% CI)	1.13 (1.07–1.19)	1.09 (1.03–1.15)	1.08 (1.02–1.14)	1.07 (1.01–1.13)	1.07 (1.01–1.13)	1.07 (1.01–1.13)	1.08 (1.02–1.14)
p-value compared to baseline BMD		0.009	0.001	0.001	0.001	0.001	0.001

Table 4. Mean periprosthetic tibial bone mineral density (g/cm²) in the subgroups of the (preoperatively) varus aligned knee group. Comparison between the knees that were varus, straight, and valgus aligned postoperatively

Postoperative alignment	Baseline	3 months	6 months	1 year	2 years	4 years	7 years
Varus, n	10	9	10	10	9	9	7
Straight, n	58	57	50	55	55	53	39
Valgus, n	7	7	7	7	6	6	6
Medial metaphyseal BMD							
varus	1.28	1.25	1.21	1.27	1.28	1.25	1.27
(95% CI)	(1.11–1.45)	(1.08–1.42)	(1.04–1.37)	(1.10–1.43)	(1.12–1.45)	(1.08–1.42)	(1.10–1.44)
p-value ^a		1.000	0.948	1.000	1.000	1.000	1.000
straight	1.27	1.21	1.18	1.16	1.16	1.14	1.11
(95% CI)	(1.21–1.34)	(1.14–1.27)	(1.11–1.24)	(1.09–1.22)	(1.10–1.23)	(1.08–1.21)	(1.04–1.18)
p-value ^a		0.033	0.001	0.001	0.001	0.001	0.001
valgus	1.17	1.09	1.04	0.98	0.93	0.96	0.88
(95% CI)	(0.99–1.35)	(0.92–1.27)	(0.86–1.22)	(0.80–1.16)	(0.75–1.12)	(0.78–1.14)	(0.70–1.06)
p-value ^a		0.979	0.341	0.017	0.002	0.008	0.001
p-value ^b					0.024		0.014
p-value ^c					0.020		0.021
Lateral metaphyseal BMD							
varus	1.25	1.26	1.29	1.25	1.30	1.26	1.31
(95% CI)	(1.07–1.44)	(1.07–1.45)	(1.11–1.48)	(1.06–1.43)	(1.11–1.49)	(1.07–1.45)	(1.11–1.50)
p-value ^a		1.000	1.000	1.000	1.000	1.000	1.000
straight	1.30	1.29	1.30	1.30	1.30	1.30	1.28
(95% CI)	(1.22–1.37)	(1.22–1.37)	(1.23–1.38)	(1.23–1.38)	(1.22–1.37)	(1.22–1.37)	(1.20–1.36)
p-value ^a		1.000	1.000	1.000	1.000	1.000	1.000
valgus	1.15	1.22	1.22	1.19	1.09	1.17	1.12
(95% CI)	(0.94–1.36)	(1.01–1.43)	(1.01–1.43)	(0.98–1.40)	(0.87–1.30)	(0.95–1.38)	(0.90–1.33)
p-value ^a		0.999	0.999	1.000	1.000	1.000	1.000
Diaphyseal BMD							
varus	1.13	1.10	1.11	1.10	1.09	1.10	1.14
(95% CI)	(0.98–1.28)	(0.95–1.25)	(0.96–1.26)	(0.95–1.25)	(0.94–1.24)	(0.95–1.25)	(0.99–1.29)
p-value ^a		1.000	1.000	1.000	0.993	1.000	1.000
straight	1.14	1.11	1.09	1.08	1.08	1.07	1.07
(95% CI)	(1.08–1.20)	(1.05–1.17)	(1.03–1.15)	(1.01–1.14)	(1.02–1.14)	(1.01–1.14)	(1.01–1.14)
p-value ^a		0.019	0.001	0.001	0.001	0.001	0.001
valgus	1.01	0.97	0.96	0.96	0.96	0.99	1.01
(95% CI)	(0.84–1.18)	(0.80–1.14)	(0.79–1.13)	(0.79–1.13)	(0.79–1.13)	(0.82–1.16)	(0.84–1.18)
p-value ^a		0.985	0.944	0.915	0.931	1.000	1.000

^a p-value within the subgroup, compared to baseline BMD measurement.

^b p-value compared to knees that were varus aligned postoperatively.

^c p-value compared to knees that were straight aligned postoperatively.

Table 5. Mean periprosthetic tibial bone mineral density (g/cm²) in the (preoperatively) valgus aligned knee group

Postoperative alignment	Baseline	3 months	6 months	1 year	2 years	4 years	7 years
No of knees studied	20	18	19	18	19	19	15
Medial metaphyseal BMD	1.01	1.06	1.02	1.01	1.00	0.97	0.90
(95% CI)	(0.90–1.13)	(0.94–1.18)	(0.90–1.14)	(0.89–1.12)	(0.88–1.11)	(0.86–1.09)	(0.78–1.01)
p-value compared to baseline		0.966	1.000	1.000	1.000	0.998	0.020 ^a
Lateral metaphyseal BMD	1.26	1.27	1.28	1.27	1.24	1.25	1.22
(95% CI)	(1.12–1.40)	(1.13–1.41)	(1.14–1.41)	(1.13–1.40)	(1.11–1.38)	(1.11–1.38)	(1.08–1.36)
p-value compared to baseline		1.000	1.000	1.000	1.000	1.000	0.999
Diaphyseal BMD	1.06	1.03	1.02	1.02	1.02	1.00	1.02
(95% CI)	(0.95–1.17)	(0.92–1.15)	(0.91–1.14)	(0.91–1.13)	(0.90–1.13)	(0.89–1.11)	(0.91–1.13)
p-value compared to baseline		0.998	0.694	0.615	0.337	0.050	0.584

^a p = 0.001 between 3-month and 7-year measurements, p = 0.011 between 6-month and 7-year measurements, and p = 0.046 between 1-year and 7-year measurements.