

Does Lateral Column Lengthening Influence Patient Outcomes in Robotic-assisted Total Knee Arthroplasty?

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Background

- When correcting arthritic deformity during total knee arthroplasty, the joint can be lengthened by inserting more material than was resected. While the medial compartment is more commonly lengthened for varus deformity, we also observe lateral compartment lengthening.
- The impact of lateral compartment lengthening on TKA outcomes is currently unknown.

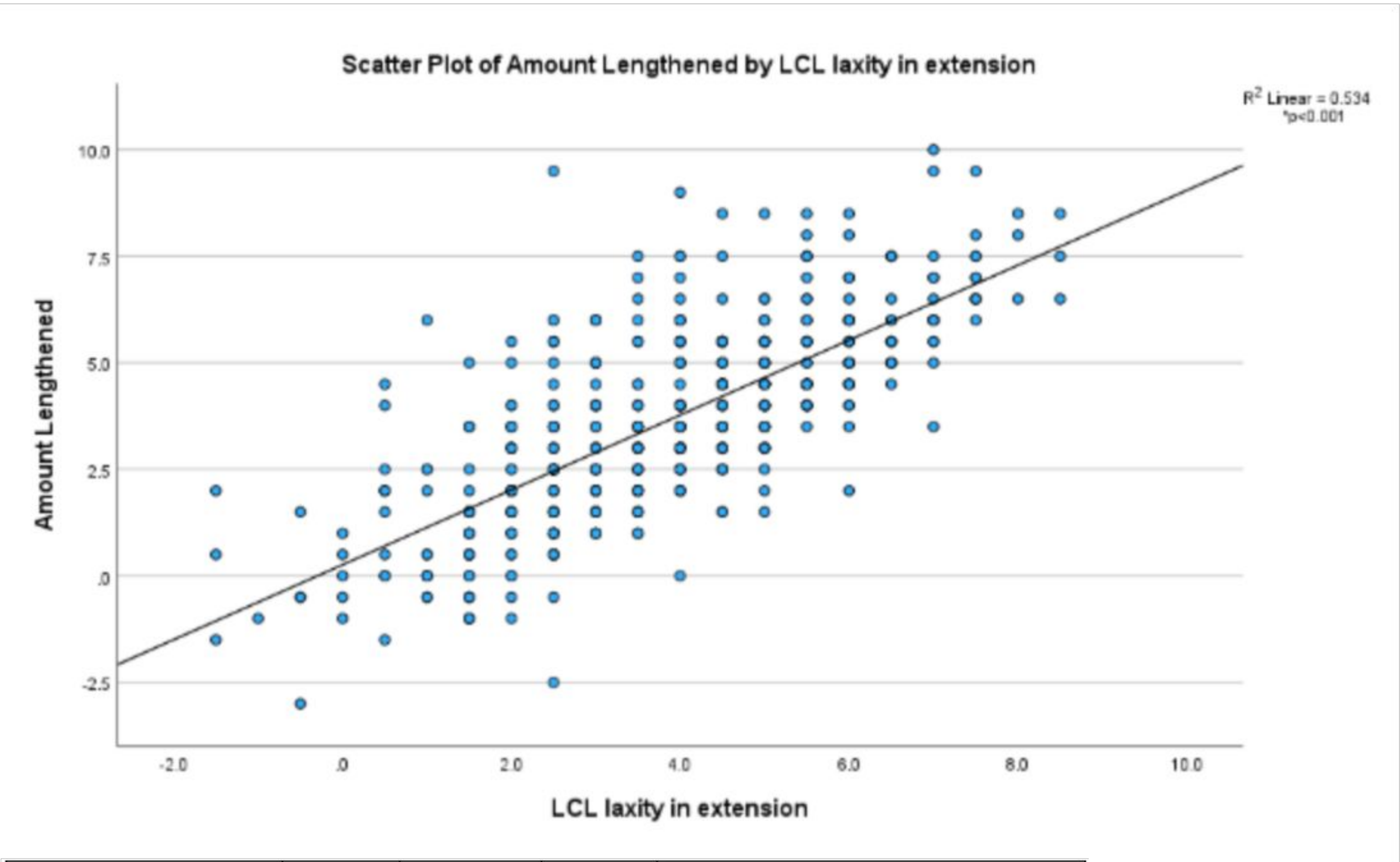
Methods

- Our study was a retrospective review of 646 patients who underwent primary robotic-assisted total knee arthroplasty with an arithmetic HKA of 0 or greater, selecting only varus or neutral knees. These cases were between January 2023 and August 2024.
- Lengthening was defined by the difference between amount of bone resected and amount of implant placed.
- We wanted to investigate the relationship between lateral column lengthening and laxity, so we used the ratio between laxity and lengthening to stratify patients into three groups. Group 1 was below the first quartile meaning patients were lengthened less than their native laxity would have predicted, Group 2 was between 1st and 3rd quartiles, and Group 3 was above the 3rd quartile, meaning patients were lengthened more than average for their amount of native laxity.

Results

- Our first analysis evaluated how outcomes differ in the PROMS: we found no significance at 6wks or 3months follow ups
- We then explored variables that could explain the lengthening. Figure 1 is a graph of the amount that the lateral column was lengthened by lateral column laxity. We found that there was a correlation coefficient of 0.73, which was statistically significant.

Results



Lateral column lengthening-to-laxity ratio	<1 st quartile (G1)	1 st -3 rd quartile (G2)	>3 rd quartile (G3)	P-value			
				G1/G2/G3	G1/G2	G2/G3	G1/G3
KOOS JR.- 3 Month	(n=32)	(n=69)	(n=41)				
¹ Stairs	1.5±0.9	1.8±0.9	1.4±0.9	.123	.128	.071	.891
² Rising from sitting	1.4±0.9	1.7±0.8	1.3±0.9	.038	.126	.013	.519
³ Bending	1.3±1	1.6±0.9	1.1±0.8	.013	.083	.003	.461

In our analysis of KOOS anterior knee pain scores, we found that there was actually **less** knee pain when bending and rising from sitting in the patients that had greater lengthening than laxity would have predicted

Conclusion

- Our overall conclusion was that lateral column lengthening did not result in inferior PROMS, and in fact did have less anterior knee pain when rising from the sitting position and for bending. We believe this to be partly due to greater preoperative deformity where lateral column lengthening was necessary to address laxity for stability.
- However, we do suspect that there is a confounder due to the clinical experience of dissatisfaction after excessive lengthening.