

Intraoperative Knee Arthrography in Toddlers with Genu Varum: How Does It Affect Decision Making for Guided Growth Treatment?

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Introduction

- We evaluated whether intraoperative arthrography changed decision making for guided growth of genu varum in toddlers.

Methods

- Six patients (10 knees) had guided growth for genu varum (average age, 28.7 months; range, 21-37 months).
- One patient had multiple epiphyseal dysplasia; 5 patients had infantile Blount disease.
- Three surgeons measured the mechanical lateral distal femoral angle (mLDFA) and the medial proximal tibial angle (MPTA) on radiographs and two weeks later measured long-leg simulated weight-bearing knee arthrograms.
- Each surgeon recorded their preferred treatment (distal femoral or proximal tibial guided growth) based on the images (with and without arthrogram).
- Paired-sample t-tests were used to compare the mLDFA and MPTA measurements for each observer on the preoperative and arthrogram radiographs ($p < .05$ statistically significant).

Results

- Each observer recorded the mLDFA and MPTA for six patients (10 knees) using radiographs and long-leg simulated weight-bearing knee arthrograms (Tables 1 and 2).
- Arthrogram measurements changed the distal femoral guided growth treatment plan for:
 - Observer 1: 2 of 10 knees (yes to no)
 - Observer 2: 3 of 10 knees (yes to no)
 - Observer 3: 4 of 10 knees (no to yes)
- Arthrogram measurements changed the proximal tibial guided growth treatment plan for:
 - Observer 1: 5 of 10 knees (3 yes to no; 2 no to yes)
 - Observer 2: 4 of 10 knees (yes to no)
 - Observer 3: 2 of 10 knees (no to yes)

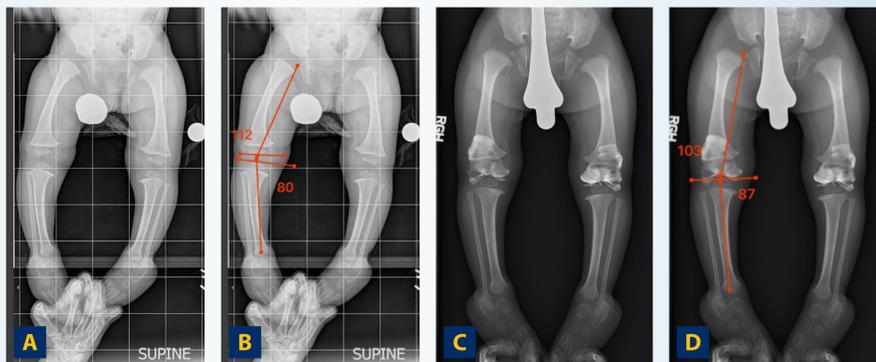


Figure 1. A and B, Apparent femoral and tibial varus on AP view full length standing radiograph in a patient with multiple epiphyseal dysplasia. C and D, Same patient after arthrogram with normal tibia and femoral varus.

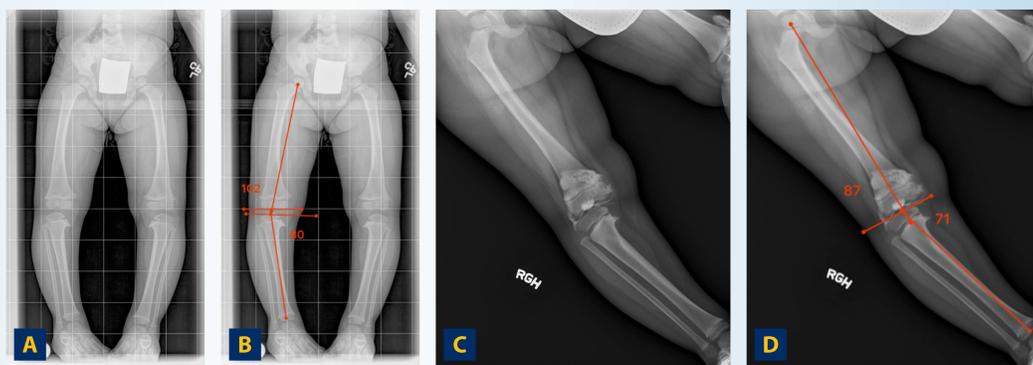


Figure 2. A and B, Apparent femoral and tibial varus in a patient with Blount disease. C and D, Same patient after arthrogram, demonstrating tibial varus only.

Table 1. Mean mLDFA measurements (6 patients, 10 knees) obtained by three observers using only preoperative radiographs or preoperative long-leg simulated weight-bearing knee arthrograms.

	Preoperative Radiographs (°)	Preoperative Arthrograms (°)	P value
Observer 1	103.4	94.1	$p < .01$
Observer 2	101.3	94.7	$p < .01$
Observer 3	101.8	95.4	$p < .01$

$p < .05$ statistically significant

Table 2. Mean MPTA measurements (6 patients, 10 knees) obtained by three observers using only preoperative radiographs or preoperative long-leg simulated weight-bearing knee arthrograms.

	Preoperative Radiographs (°)	Preoperative Arthrograms (°)	P value
Observer 1	82.4	84.8	0.16
Observer 2	83.1	84.9	0.17
Observer 3	82.1	85.1	0.23

$p < .05$ statistically significant

Conclusion

- Intraoperative knee arthrography in toddlers with genu varum changed the mLDFA measurements compared to plain films due to the delineation of the cartilaginous femoral condyles.
- Arthrogram measurements can help the clinician to decide on guided growth treatment strategies for the distal femur and proximal tibia.