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THE ROLE OF PROXIMAL FIBULA DURING BILATERAL TIBIAL LENGTHENING IN ACHONDROPLASIC PATIENTS

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Fundación

Introduction

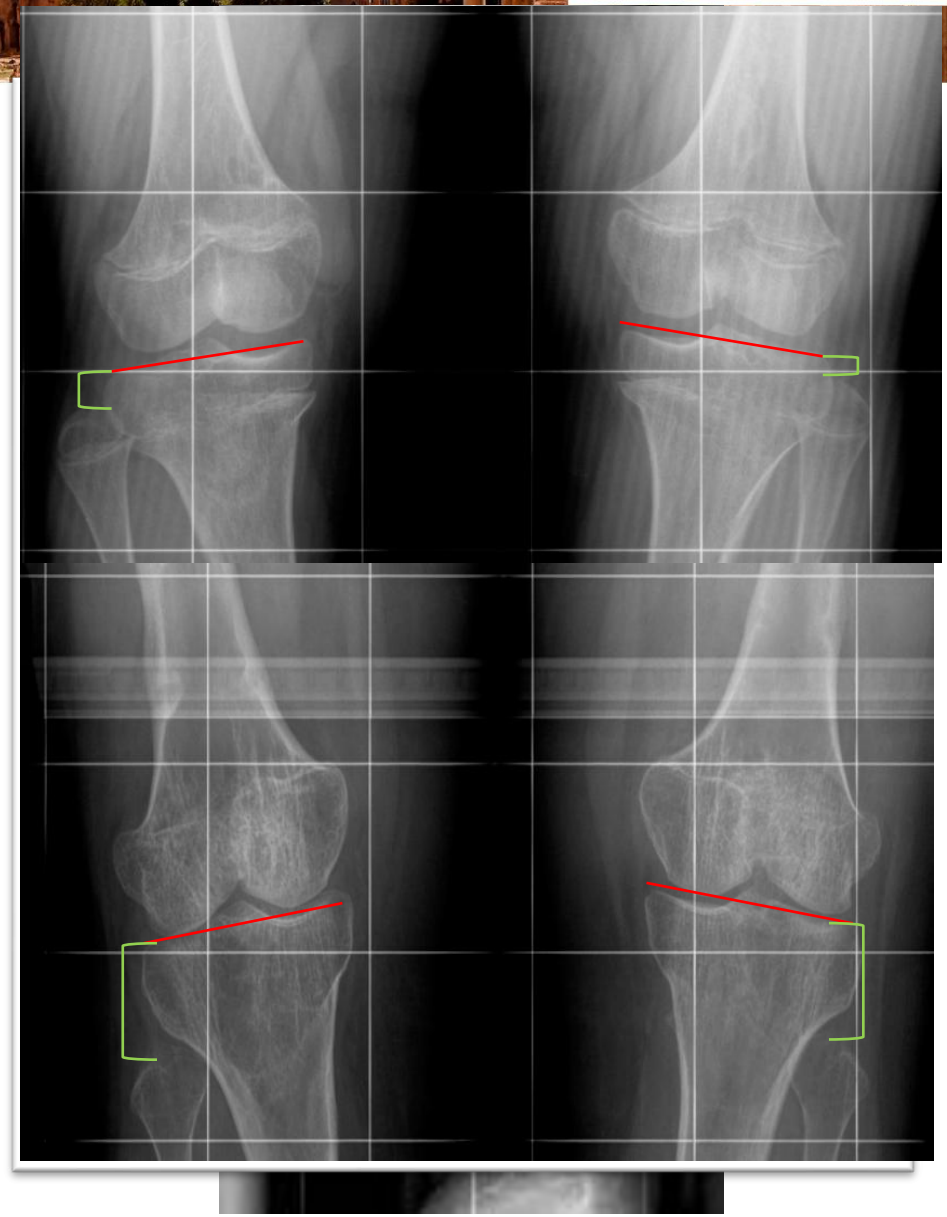
- The descent of the fibular head occurs during tibial lengthening with a monolateral fixator in achondroplastic patients.
- The role of proximal tibiofibular joint fixation during tibial lengthening is still debated in the literature.
- **The aim of our study was to evaluate the clinical and radiological effects when the fibula head is NOT fixed to the tibia during the tibial lengthening in achondroplasic patients.**

Methods

- From 2007 to 2019
- 43 achondroplasic patients
- 86 tibial lengthening procedures **without proximal tibiofibular joint fixation**
- Mean follow-up: 7.4 years
- 25 male / 18 female
- Mean age surgery: 11 years old

Radiographic parameters

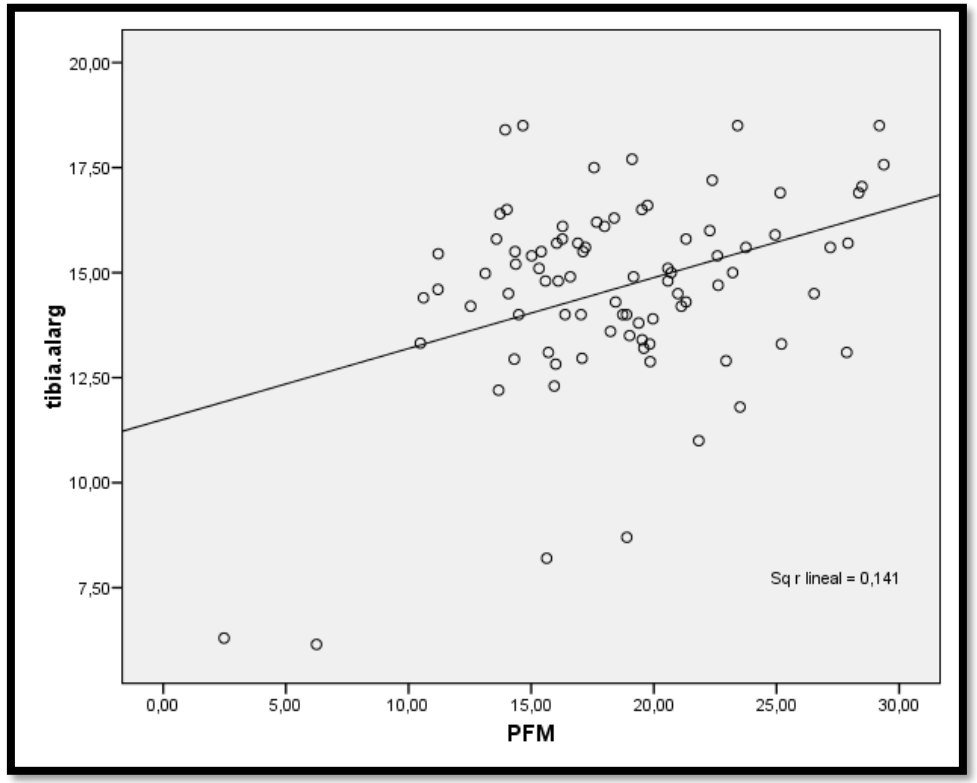
1. **Mechanical axis deviation (MAD)**
   - A value of >10mm valgus was assumed to be clinically important
2. **Tibiofibular distraction difference (TFDD)**
3. **Proximal fibular migration (PFM)**
4. **Tibial angulation**
   - A value of >10º valgus was assumed to be clinically significant

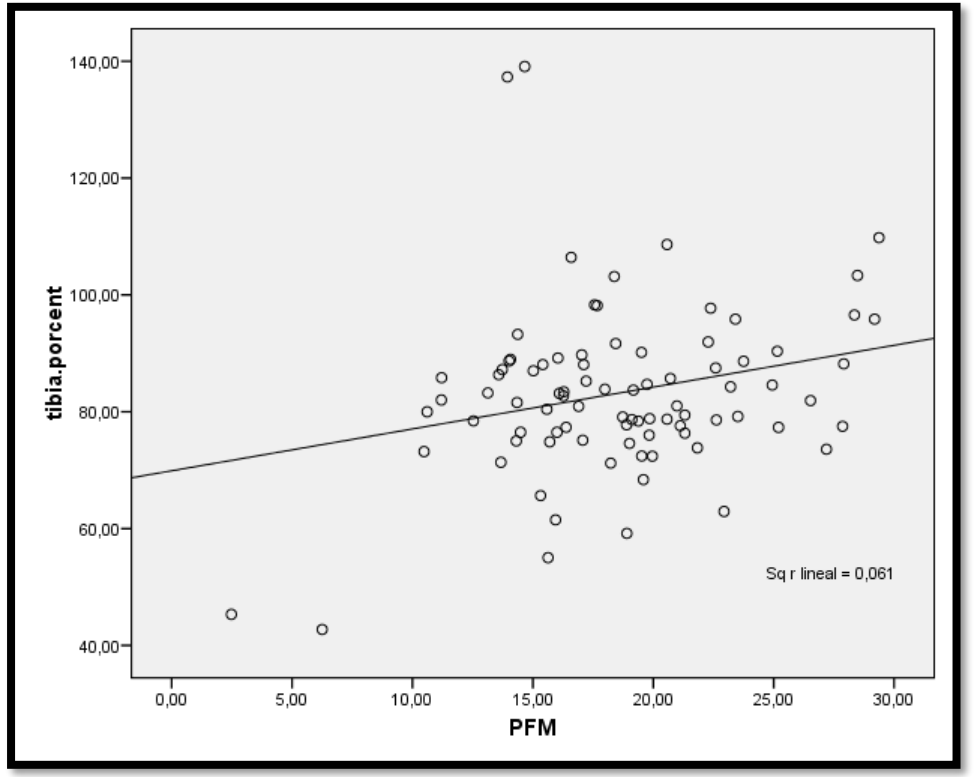


Results

- Mean amount of lengthening: 14.64 +/- 2.25 cm
- Mean percentage lengthening: 83%
- Mean duration of follow-up: 7.35 years
- Mean MAD: 11.91mm preoperatively and 8.2 mm at the final follow-up.
    - Final follow up: 53 varus and 18 valgus, only 10 with >10mm
- Mean TFDD: 37.39 +/- 14.5 cm
- Mean PFM: 18,55 +/- 5 mm
- Mean amount of tibial angulation was -6.4º +/- 9.1º preoperatively and 7.09 +/- 6.7º at the final follow-up.
    - Preoperatively 59 varus and 15 valgus
    - Final follow-up 1 varus and 75 valgus, only 26 with >10º

Results





The degree of **proximal fibular migration** was linearly correlated with the amount of lengthening and the percentage lengthening.

Results

Comparison according to postoperative MAD

Postoperative MAD	No of Segments	Tibial Lengthening (cm)	Percent Tibial Lengthening	Tibiofibular Distraction Difference (mm)	Proximal Fibular Migration (mm)	Tibial angulation (deg)
Valgus (>10mm)	10	15.5 +/- 1.6	94.4 +/- 20.8	34. 3 +/- 15.3	20.7 +/- 5.4	11.4 +/- 8.6
Normal axis	40	15.10 +/- 2.1	84.9 +/- 12.8	38.7 +/- 12.9	19.5 +/- 4.8	7.1 +/- 7.1
Varus (>10mm)	34	13.8 +/- 2.5	77.7 +/- 12.6	37.4 +/- 16.4	17 +/- 4.9	6.6 +/- 4.5
P value		0,031	0.013	>0.05	>0.05	>0.05

Valgus of the knee increased as extended the magnitude of the lengthening. In contrast, **the proximal fibular migration** was not associated with valgus deformity of the knee.

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Results

Major complications	Nº segments	Need surgery
Premature consolidation of the fibula	4	4
Valgus deviation	8	8
Valgus + Torsional deviation	4	4
Varus deviation	1	0
Tibial Fracture	1	0
Joint stiffness	2	1
Equinus contractures	6	2
Delay in consolidation	2	2

27/86 segments → **31%**

Results

Comparison according to presence of major complications

	No of Segments	Percent Tibial Lengthening	Tibiofibular Distraction Difference (mm)	Proximal fibular migration (mm)	Tibial angulation (deg)	MAD	Fibula resection (mm)
YES	27	82.2 +/- 14.4	38.3 +/- 11.9	17.9 +/- 4.7	10.6 +/- 8.9	3.6 +/- 15.6	13.2 +/- 4.4
NO	59	83.7 +/- 14.8	36.9 +/- 15.7	18.8 +/- 5.2	5.9 +/- 4.3	10.5 +/- 14.7	15.1 +/- 3.6
P value		>0.05	>0.05	>0.05	0.057	0.04	0.003

The fibula resection and the mechanical axis deviation were associated with the presence of complications. In contrast, **the proximal fibula migration** was NOT.

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Conclusion

- Proximal fibular migration is common during tibial lengthening in achondroplasic patients.
- Tibiofibular distraction difference, proximal fibular migration, and tibial angulation increase proportionally with the amount of lengthening.
- Valgus deformity was associated with the amount of tibial lengthening.
- **No** correlation was found between **proximal fibular migration** and valgus deformity, tibial angulation, or major complications.
- **These findings indicate that the fixation of the proximal tibiofibular joint is NOT required in bilateral tibial lengthening with unilateral external fixation in achondroplasic patients.**

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