Going to Great Lengths for the Elderly: Magnetic Limb Lengthening Nails in the Seventh Decade and Beyond

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Introduction

- Outcomes with motorized magnetic limb lengthening nails have been reported for the general population, typically in patients who are younger than 50 years.[1]
- Motorized magnetic intramedullary lengthening nails are the latest technology and were introduced in an effort to make limb lengthening easier and more comfortable.[1–3]
- What are the outcomes, complications, and viability of lower limb lengthening in older adults using motorized magnetic lengthening nails?

Methods

- Retrospective chart and radiographic review was conducted for 5 patients (3 men, 2 women).
  - Radiographic review utilized digital films in conjunction with clinical notes to determine preoperative limb length discrepancy (LLD), amount of lengthening achieved, and the date of full distraction and complete consolidation.
- All underwent unilateral lengthening (1 tibia, 4 femora) using motorized magnetic nails.
- Mean age: 67 years (range, 63–72 years)
- Initial etiology of shortening was:
  - Trauma: 4 cases
  - Knee fusion: 1 case
- Mean lengthening goal: 3.1 cm (range, 2.5–4.0 cm)

Results

- All 5 patients completed the distraction phase and achieved their initial lengthening goal (Table 1, Figures 1–4).
- Mean follow-up after index surgery: 11.9 months (range, 5.7–21.7 months)
- Mean distraction index: 0.7 mm/day (range, 0.6–0.8 mm/day)
- Mean consolidation index: 32.4 days/cm (range, 27.6–49.6 days/cm)
- Two complications occurred:
  - 1 limb had osteomyelitis
    - Required premature nail removal
  - 1 limb was not lengthened for several days (remote controller device malfunction)
    - Treated by increasing the lengthening rate from 1 mm/day to 1.25 mm/day for 1 week.

Table 1. Demographics and Outcomes for Each Patient.

#	Etiology	Age	Gender	Side	Bone	Goal (cm)	Length achieved (cm)	Distraction index (mm/day)	Consolidation index (days/cm)
1	Posttraumatic injury	63	M	Right	Femur	3.0	3.0	0.083	30.3
2	Posttraumatic injury	66	F	Right	Tibia	3.0	3.0	0.081	23.6
3	Posttraumatic injury	72	F	Right	Femur	2.5	2.5	0.058	27.6
4	Posttraumatic injury	65	M	Left	Femur	4.0	4.0	0.074	30.8
5	Posttraumatic injury	71	M	Right	Femur	3.0	3.0	0.065	49.6

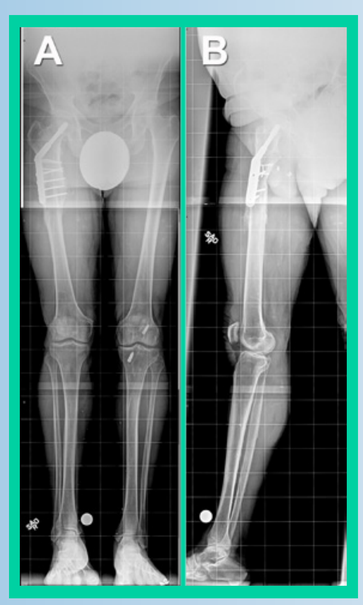

Figure 1. Posttraumatic femoral deformity in a 71-year-old patient (case number 5 in Table 1). Preoperative AP (**A**) and lateral (**B**) view radiographs of the affected femur before insertion of the motorized magnetic lengthening nail.

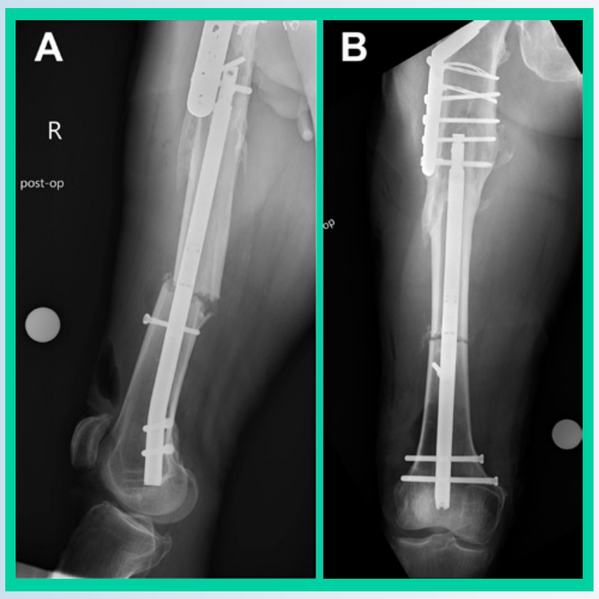

Figure 2. Immediate postoperative lateral (**A**) and AP (**B**) view radiographs of the affected femur after insertion of the motorized magnetic lengthening nail.

Figure 3. Postoperative AP (**A**) and lateral (**B**) view radiographs of the affected femur after 3-cm distraction with the motorized magnetic lengthening nail.

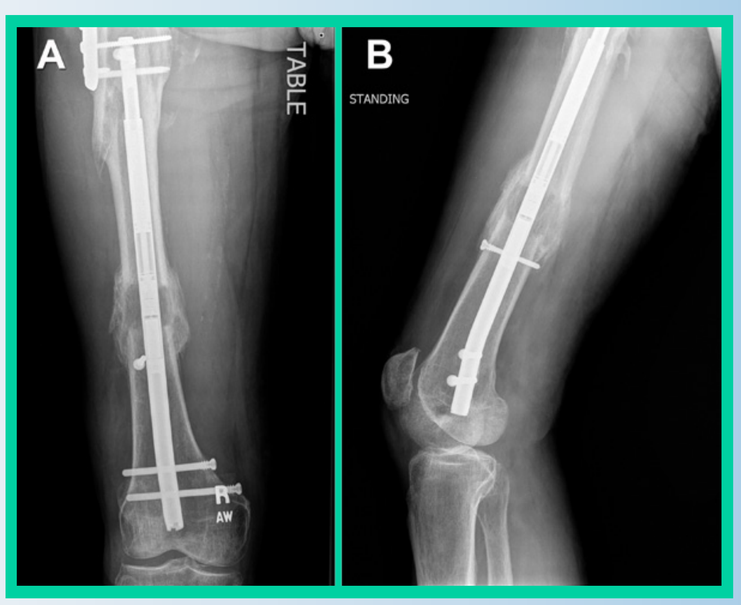

Figure 4. Postoperative AP (**A**) and lateral (**B**) view radiographs show complete consolidation after femoral lengthening with the motorized magnetic lengthening nail.

Discussion

- Lengthening with magnetic nails in older adults resulted in distraction, consolidation, and complication rates that are similar to outcomes reported in the general population.
- Motorized magnetic limb lengthening nails are a viable option to treat LLD in otherwise healthy individuals into the seventh and eighth decades of life.

References

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