

The Limb Lengthening and Reconstruction Society: ASAMI–North America

Sixteenth Annual Scientific Meeting Abstract Form

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Title: Lengthening and Then Nailing (LATN)

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Select all that apply:

Category

• Limb Lengthening

- Trauma, Acute
- Nonunions
- Deformity Correction
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What was the question?

Although lengthening with the classic Ilizarov method is successful, it often requires a lengthy time in frame. Lengthening over a nail (LON) and available internal lengthening nails have limitations. Lengthening and then nailing (LATN) was introduced to address deformity correction while minimizing the time needed in a frame. Can LATN be used effectively?

How did you answer the question?

LATN was used to treat 36 limbs in 24 patients, 33 tibiae and 3 femora. The reason for treatment was leg length discrepancy (LLD) from malunion in 6, fibrous dysplasia in 3, nonunion in 2, polio in 1, and for stature lengthening in 12 patients. Ilizarov/ Taylor Spatial or EBI monolateral frames with were used for the distraction phase with pin /wire placement to allow subsequent intramedullary nailing. At the end of distraction, reamed intramedullary nails were inserted and frames were removed. Contact between external fixation pins/ wires and internal fixation was avoided. Large diameter full length statically locked nails were inserted. Clinical and radiographic data were recorded.

What are the results?

The average patient age was 37 years (range, 22-60). Average follow-up was 34 months (range, 6-60). Leg length discrepancy improved from 6.3 cm (range, 2.5-12.6) to 1 cm (range, 0-2.6). Lengthening accomplished was 5.7 cm (range, 2.5-10). Time in frame averaged 13 weeks (range, 3-27). The EFI was 0.5 months/ cm (range, 0.3-0.7). Delay between the end of distraction and nailing was an average of 9.8 days (range, 0-35). Full weight bearing was tolerated 7 weeks (range, 6-11) after nailing and was considered the time of bony healing. Bone healing index was an average of 0.8 months/ cm (range, 0.4-1.2). Ankle and knee ROM did not change with treatment and were 9⁰ dorsiflexion to 39⁰ plantar flexion and 0⁰ extension to 127⁰ flexion respectively. Sagittal plane and rotational deformities were fully corrected in 1 and 2 patients respectively. Preoperative MAD averaged 28.8 mm lateral and 7 mm medial. Final MAD averaged 9 mm lateral and 10 mm medial. Final LDFA averaged 88⁰ (range, 81⁰-91⁰). Final MPTA averaged 87⁰ (range, 83⁰-105⁰). Complications included skin breakdown over a prominent interlocking screw and deep infection in one patient. This was treated successfully with nail removal and 6 weeks of intravenous antibiotics. The regenerate was fully healed at that point and no other hardware was needed. One patient with spina bifida developed temporary bilateral sciatic nerve palsy that resolved. There were no nonunions, fractures or loss of position. Additional procedures included gastrocnemius recessions (14), gradual correction of a knee contracture (1), gradual correction of ankle contracture (1), ankle fusion (2), repeat fibula osteotomies (2), and intramedullary nail removals (9).

What are your conclusions?

LATN seems to be a safe and effective procedure for limb lengthening and deformity correction. Like LON, it allows frame removal after the distraction phase of lengthening. There may be several advantages over LON: the ability to insert a full length large diameter nail for more stability; avoiding concomitant use of internal and external fixation and lower risk of infection; ability to gradually correct diaphyseal deformity and lengthen prior to nail insertion expanding the indications; reaming through the regenerate appears to enhance and quicken the bone healing. Further study of LATN is warranted including the biology of regenerate

