



Abstract: Lengthening and Then Nailing (LATN) of the Tibia

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What was the question?

Although tibia lengthening with the classic Ilizarov method is successful, it often requires a lengthy time in frame. Lengthening over a nail (LON) has been used successfully to decrease the time in frame. Can lengthening and then nailing (LATN) be used successfully in the tibia. Are there advantages of this technique over LON?

How did you answer the question?

LATN was used to lengthen 4 tibiae in 3 patients. These patients were prospectively followed. Ilizarov/ Taylor Spatial frames with were used for the distraction phase with pin placement to allow subsequent intramedullary nailing. Residual deformity correction was utilized to correct diaphyseal deformity before nailing. At the end of distraction, reamed tibial nails and syndesmosis screws were inserted, and circular frames were removed. Contact between external fixation pins/ wires and internal fixation was avoided. Large diameter full length statically locked tibial nails were inserted. Syndesmosis screws were removed at 3 months. Clinical and radiographic data were recorded.

What are the results?

The average patient age was 36 years(28-46). Preoperative diagnoses were fibrous dysplasia, malunion with shortening, and hypochondroplasia dwarfism. Leg length discrepancy improved from 6 cm (3.5-8.5) to 0.4 cm. Tibial lengthening accomplished was 5 cm (3-7). Time in frame was 2.8 months (1.7-4.6). Full length 10 mm and 11.5 mm reamed tibial nails were used in all cases. Staged gastrocnemius recession procedures were performed in all patients. At average followup of 10 months, ankle range of motion was 2.5° dorsiflexion to 40° plantar flexion. Full weight bearing was begun 3 months (2.3-3.5) post nailing and was considered time of bony healing . Bone healing index was 1.1 months/cm (0.85-1.2). Complications included skin breakdown over a prominent interlocking screw and superficial infection in one patient. This was treated successfully with screw removal and one week of intravenous antibiotics. There were no deep infections, no fractures, and no loss of knee ROM.

What are your conclusions?

LATN seems to be a safe and effective procedure for tibial lengthening. 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 bone healing. Further study of LATN is warranted including the biology of regenerate reaming, biomechanical stability of the nail construct, and further clinical use and followup.