

# Simultaneous Limb Lengthening with Ankle Fusion Using an Internal Lengthening Nail

## Purpose

The purpose of this study is to evaluate whether ankle fusion and limb lengthening can be achieved simultaneously by insertion of a retrograde intramedullary tibial lengthening nail combined with ankle fusion.

## Materials and Methods

We retrospectively reviewed of 17 patients with previously failed ankle fusions or osteotomies around the ankle. All patients had preoperative LLD. Ankles were fused using a retrograde intramedullary tibial nail and screws placed adjacent to the nail. Lengthening was carried out by a tibial osteotomy proximal to the fusion site. Clinical, subjective, objective, and radiographic analyses were performed after an average follow-up of 12 months.

Average age was 37 years old. Mean weight was 65kg and the mean height was 160cm. The average preoperative LLD was 4.9cm (2.6-7.6cm). All patients complained of pain preoperatively and of significant limp. The average level of the tibial osteotomy was 13cm proximal to the plantar calcaneus. Average distraction rate was 0.75mm per day.

BONE LENGTHENING



ANKLE FUSION



## Materials and Methods Continued

Surgical technique:

Either medial or lateral approach was used. Ankle joint was prepped with sagittal saw. If the subtalar joint was present it was curvetted and fenestrated. A Steinman pin is then placed from the plantar calcaneus into the tibia along the proposed path of the nail. Fluoroscopy is used to check positioning. Multiple drill hole osteotome osteotomy was then performed followed by anterior compartment fasciotomy. Sequential reaming was then performed. Nail was inserted followed by distal locking screws and Large cannulated screws were placed on either side of the nail distally. Proximal locking screws were then placed.

PRE-OP



POST-OP



## Results

Ankle fusion was achieved in all cases. The amount of lengthening performed was 1.8 to 7.2cm (mean 3.95cm). The final average LLD was 1cm (0.7-1.1cm). The foot was plantigrade in all cases. The foot rotation 10 degrees (5-15 degrees) external, relative to the knee in all cases. At final follow-up no patient had pain and all claimed to be walking much better than before surgery. Patients were walking with minimal to no limp after surgery based on the surgeon's observation.

Post-operative complications included 4 patients who had a superficial skin infection after surgery. There were no other complications in this series.

## Discussion

In our series we successfully achieved ankle fusion with simultaneous tibial lengthening using an internal lengthening nail. This in turn would theoretically improve gait and function for these complex ankle deformities.

## References

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