

# A case of phalangeal lengthening

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A severely shortened and deformed index finger – due to osteomyelitis of the middle phalanx – of a 12-year-old boy was lengthened by using a Kessler distraction device. Distraction for 2 weeks followed by interposition of a 15-mm bone graft resulted in a stable painless finger of normal length.

Lengthening of metacarpals by continuous distraction has been used in congenital hand anomalies (Matev 1967, Kessler et al. 1977, Paneva-Holevich & Yankov 1980) following amputation of the thumb at the metacarpophalangeal level (Matev 1970, 1979, 1985, Allieu 1985) and following severe hand injuries with a loss of bone substance (Kessler et al. 1979, Bilos & Ekestrand 1979). External fixation has also been used for fixation of comminuted fractures of fingers (Allieu 1985). We report a case of middle phalanx collapse secondary to osteomyelitis lengthened by using a Kessler distraction device.

## Case report

A 12-year-old boy had his right index finger caught between two stones on July 17, 1984. A skin laceration at the PIP joint level was revised and sutured. Four days later he developed pain, and because of a local skin infection he was treated with peroral antibiotics. The pain disappeared and the wound seemed to heal adequately.

Two months later the boy was admitted because

of recurrent pain and swelling. The finger was 3–4 mm shorter than the left index finger and there was a severe radial deviation of the middle and distal phalanges. Radiograms showed severe destruction of the DIP and PIP joints and collapse of the middle phalanx owing to osteomyelitis (Figure 1). There was no ongoing infection during the following months, but there was a progression of the deviation and shortening of the finger. The end result was a deformity of such a degree that corrective osteotomy was indicated.

On April 9, 1985, osteotomy of the middle phalanx was performed. A Kessler distraction device was inserted and distraction at a rate of 1/2–1 mm per day was initiated. The distraction was performed by the patient's father by winding two screws in the frame 360° each day.

No neurologic or vascular complications in the finger were observed during the distraction period. On April 30, 1985, a lengthening of 15 mm had been achieved. The distraction device was removed and a corticospongyous bone graft from the iliac crest was interposed in the bone defect. Bone fixation with the PIP joint in 60° flexion was achieved with two longitudinal K-wires. The PIP and DIP joints were both ankylotic. Radiographs 2 months later showed complete healing (Figure 1) and the wires were removed.

The clinical result was very good with the index finger of the same length as the contralateral one and without any deviation. The index finger was completely free of pain; and in spite of ankylotic PIP and DIP joints, hand function, including pinch grip, was excellent.

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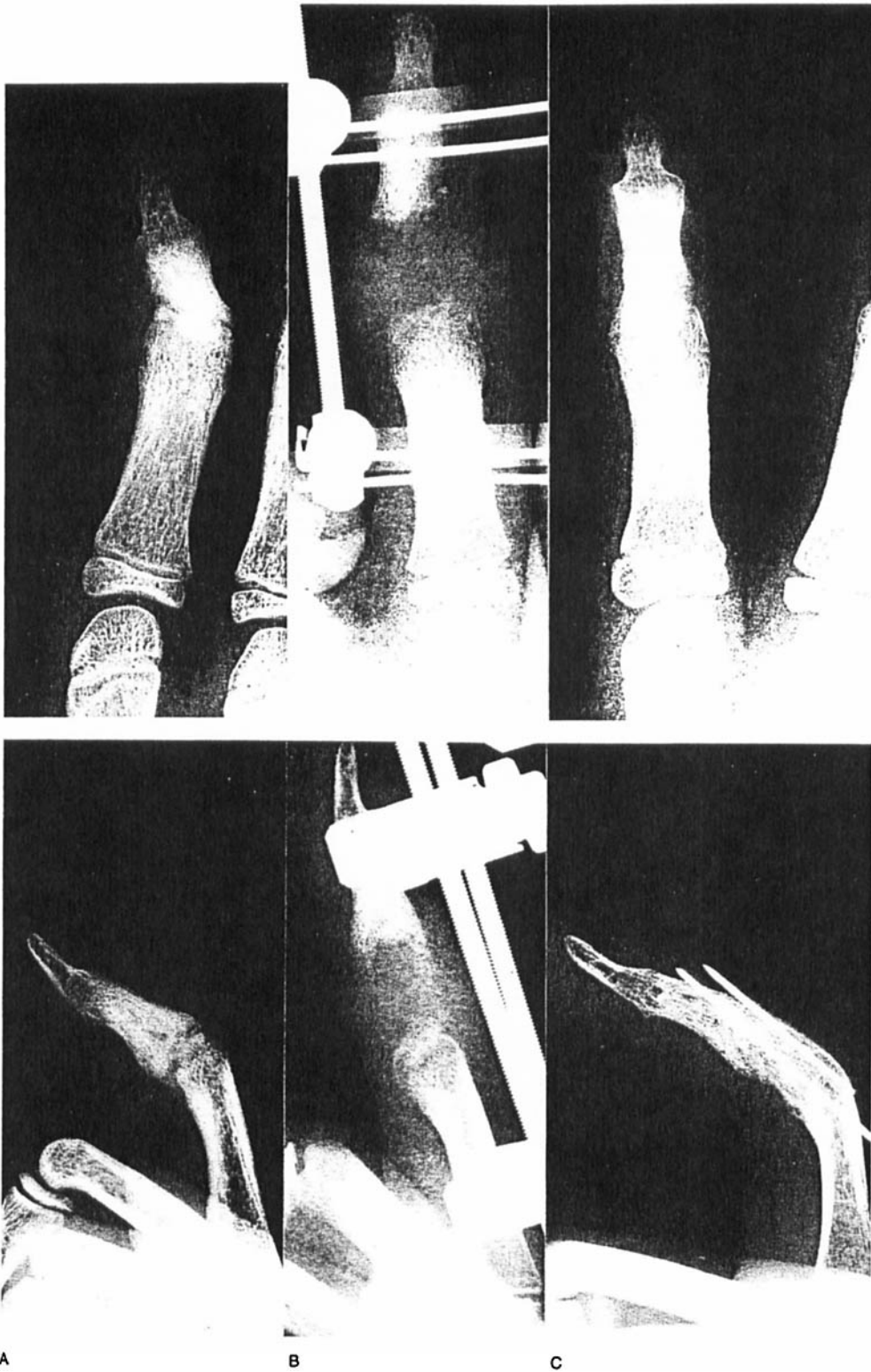


Figure 1. Phalangeal lengthening of the index finger in a 12-year-old boy.  
A. Preoperative appearance.  
B. Appearance following distraction of 1 mm per day over a 3-week period.  
C. Two months following interposition of a 15 mm bone graft. Healing was achieved in good position of the finger.

## Discussion

The principle of continuous distraction implies good possibilities to lengthen bone structures because associated soft-tissue structures usually adapt well to the slow stretching. The soft-tissue structures of the palm and dorsum of the hand are not enclosed in tight compartments and are known to tolerate a continuous stretching well without development of vascular or neurologic insufficiency. In the fingers the anatomic condi-

tions are different. Owing to the tightness of the tissue spaces at this level, the tolerance to continuous stretching of vessels and nerves would be expected to be limited. In addition, the skin of the fingers, especially on the volar side, is tightly adherent to underlying structures by fibrous septa. For these reasons, lengthening through osteotomy followed by bone grafting in *one* stage would result in a very limited lengthening of the finger.

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