Avascular Necrosis of the First Metatarsal from Failed Bunion Surgery: A Case of Second Metatarsal Bone Transport with External Fixation

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Purpose

Large bone defects can be difficult to treat. Large segmental bone grafting can be fraught with complications and published results are mixed. We present a case and result of use of external fixation for medial transport of the second metatarsal to repair a large bone defect caused by AVN affecting the first metatarsal.

Literature Review

Ilizarov bone transport has been widely practiced across the world and is a preferred method by many reconstructive surgeons to manage large long bone defects.
Many authors have reported success with using fibular transport for large tibial defects. [1-7]
In 2000 Paley reported on Ilizarov bone transport in 19 patients with tibial defects averaging 10 centimeters with union achieved in all cases. The results were graded as excellent in 15 patients, good in 3 patients, and poor in 1 patient. [2]
To our knowledge this is the first reported use of this technique for a metatarsal defect.

Case Study

A 49 year old female was referred to our clinic for evaluation of 2 year history of 1st metatarsal AVN which developed after a bunion surgery.
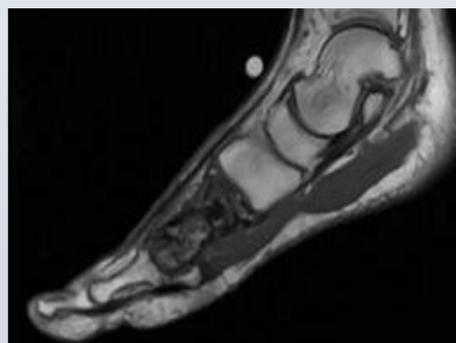
PRE-OP X-RAY   PRE-OP MRI
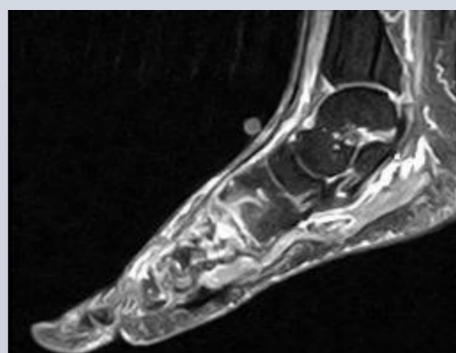
Case Study Continued

We performed a two-staged procedure where we first debrided the non-viable 1st metatarsal and spanned the medial column with external fixation. The second metatarsal was then captured with 2 transverse rail external fixators which were fixated laterally into the 4th and 5th metatarsal. The 2nd metatarsal was osteotomized and gradually transported medially in place of the 1st metatarsal. In the second stage of the procedure we modified the external fixation construct to compress the second metatarsal to fuse it to the hallux and the medial cuneiform.

2ND METATARSAL TRANSPORT   MEDIAL COLUMN FUSION

2ND METATARSAL TRANSPORT

Results

At 12 month follow up 1st ray position and length was maintained. Patient had no pain and had returned to her desired daily activities.

PRE-OP   POST-OP

Discussion

Bone transport is a reliable method for treating large bone defects in the lower extremity. We present a successful case of gradual second metatarsal transport to treat AVN with a large bone defect involving the first metatarsal after failed bunion correction.

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