

Nonunions of Fifth Metatarsal Fractures: Our Institutional Experience

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Purpose: Painful nonunion is a well-described complication of proximal 5th metatarsal (MT) fractures despite the fact that the vast majority of them heal uneventfully. The aim of this study was to present the incidence and evaluate the safety and efficacy of the management of symptomatic 5th MT nonunions.

Methods: This is a case series of patients treated in our institution for isolated 5th MT symptomatic nonunion following failure of nonoperative management. The fractures were classified according to the Lawrence classification. A nonunion was defined as a painful 5th metatarsal fracture 3 months after presentation with radiographic evidence of bone resorption with radiolucency at the fracture line along with obliteration of the medullary canal by sclerotic bone for fractures distal to the tuberosity and absence of callus formation in two orthogonal radiographs for Type I fractures. Patients with an open fracture, injuries involving the Lisfranc complex, and polytrauma patients were excluded. The following parameters were collected and evaluated: (1) patient demographics, (2) mechanism of injury, (3) type of operation, (4) time to solid radiographic union, (5) time to return to previous everyday activities, and (6) complications. The patients were followed up until clinical and radiographic union were evident.

Results: Over a 7-year period, 41 patients (mean age, 33.3 years; range, 9-66) out of 2940 (1.39%) with 5th metatarsal fractures treated in our institution developed a painful nonunion. 7 out of 2268 (0.6%), 22 out of 168 (13.1%), and 12 out of 504 (2.4%) Type I, II, and III fractures, respectively, developed a symptomatic nonunion. The most common mechanisms of injury were participation in sports (32.5%) and fall from a standing height or an ankle twist with the forefoot fixed (35%). 19 patients were smokers and 3 suffered from diabetes. The median time from the index fracture to the operation for the nonunion was 16 weeks. 26 of them had cannulated screw fixation, 12 underwent open reduction and internal fixation (ORIF), and 3 fragment excision. In 9 patients there was a residual gap following reduction and autologous bone graft was used to augment the fixation. The mean time to healing was 14.4 weeks (range, 6-106 weeks); in one patient an ORIF was revised to a cannulated screw because of a persistent nonunion and the fracture finally united after 106 weeks. The most common complication was prominent metalwork (7 patients); in 6 of them the metalwork was removed and the symptoms improved, whereas one patient refused any further procedures. At the time of union all but the patients who had a second operation reported that they had returned to their previous everyday activities. The patient who had a revision surgery for a persistent nonunion became symptom-free 3 months after the second operation. The rest of the patients assumed symptom-free foot function a month after the removal of implants.

Conclusion: Surgical management of symptomatic 5th metatarsal nonunions is a safe and efficient procedure. We recommend either excision or fixation depending upon the fracture size, closed intramedullary screw fixation, and ORIF for nonunions of Type I, II, and III fractures, respectively.

- The FDA has not cleared this drug and/or medical device for the use described in this presentation (i.e., the drug or medical device is being discussed for an "off label" use). For full information, refer to page 600.