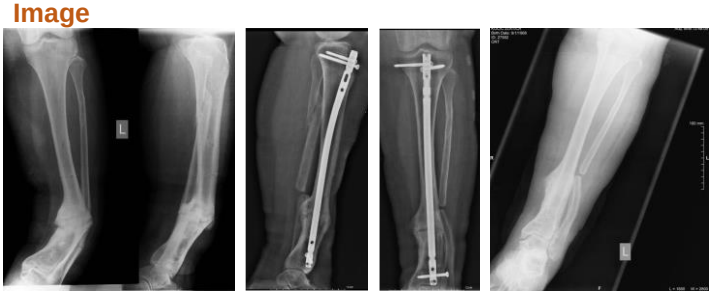
The diaphyseal aseptic tibial nonunions after failed previous treatment options managed with the reamed intramedullary locking nail

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Abstract

Tibial nonunions constitute the majority of long bone nonunions seen by orthopaedic surgeons. In this article, we present our approach to the surgical treatment of noninfected tibial shaft nonunions. Between 2008 and 2014, 33 patients with aseptic diaphyseal tibial nonunion was treated by reamed intramedullary nailing and were retrospectively reviewed. The initial fracture management consisted of external fixation (27 patients), plate fixation (2 patients) and cast treatment (4 patients). All patients, preoperatively, were evaluated for the signs of the infection, by the same protocol. There were 13 hypertrophic, 16 oligotrophic (atrophic) and 4 defect nonunions registered in our material. Patients were examined regularly during followed-up for a minimum of 12 months period for clinical and radiological signs of union, infection, malunion, malalignment, limb shortening, and implant failure. The time that elapsed from injury to intramedullary nailing ranged from 9 months to 48 months (mean 17 months).Open intramedullary nailing was unavoidable in 25 cases (75,75%), while closed nailing was performed in 8 patients (24,25%). Osteotomy or resection of the fibula was performed in 78,8% of the cases. All patients were followed up in average period of 2 years postoperative (range 1–4 years), and 31(93,9%) patients achieved a solid union within the first 8 months. Mean union time was 5±0.8 months. Complications included 2 (6,06%) patients, one with deep infection and another case with absence of bone healing. Anatomical alignment has been achieved in the majority of patients, 28 patients (84,8%). The additionally autogenous bone chips were added in 4 patients (12,1%) where cortical defect was greater than 50% of the bone circumference. In conclusion, a reamed intramedullary nail provides optimal conditions for stable fixation, good rotational control, adequate alignment, early weight-bearing and a high union rate of tibial non-unions. Reaming of the medullary canal with preservation of periosteal sleeve create the "breeding ground" for sound healing of tibial shaft nonunions.

Image



47-years old female patient with stiff hypertrophic nonunion 36 months old, treated with open reamed IM nailing without bone grafting due to obliteration of medullary canal and fibular resection; b) aligned bone consolidation after 8 months; c) one year later the nail has been removed.

Recent Publications

1. Hak DJ. Management of aseptic tibial nonunion. J Am Acad Orthop Surg. 2011 Sep;19(9):563-73.
2. Byron E. C., George E. P., Nick C. S., Christos G. D., Anastasios G. C. Reamed interlocking intramedullary nailing for the treatment of tibial diaphyseal fractures and aseptic nonunions. Can we expect an optimum result? Strat Traum Limb Recon (2009) 4:89–94.
3. Swanson EA, Garrard EC, O Connor DP, Brinker MR. Results of a systematic approach to exchange nailing for the treatment of aseptic tibial nonunion. J Orthop Trauma 2015;29(1):28–35.
4. Malekpoor S, Moghtadaei M, Akbarian E, Hamedanchi S. Management of tibial non-union using reamed interlocking intra-medullary nailing. Medical Journal of the Islamic Republic of Iran, 2009;22(4):184- 190.
5. Leow JM, Clement ND, Tawonsawatruk T, Simpson CJ, Simpson AH. The radiographic union scale in tibial (RUST) fractures: reliability of the outcome measure at an independent centre. Bone Joint Res 2016;5(4): 116-21.

Photograph



Biography

Dr Igor Kostić is an consultant orthopaedic and trauma surgeon with 19 years of work experience at the Deapartment of orthopaedics and traumatology at University hospital of Nis, Serbia, as board certified specialist of orthopaedic surgery and traumatalogy. He is an expert in hip and knee arthroplasty , trauma surgery, limb lengthening procedures and treatment of posttraumatic deformities. During his education, he obtained trauma training at the General Hospital (AKH) of Vienna under the supervision of Uni Prof Dr. Stefan Hajdu and orthopaedic training at Sozialmedizinisches Zentrum Ost - Donauspital in Vienna under supervision of Uni Prof Dr Mehdi Mousavi. He received his PhD at his home university under the mentorship of Academician Uni Prof Dr Milorad Mitković from the field of orthopedics of traumatology and obtained the title of Doctor of Medical Science. Actively participate in the education of young doctors in residency at his University Clinic.

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Notes/Comments: