

## 12<sup>th</sup> International Conference on **ARTHROPLASTY**

June 24-25, 2019 | Rome, Italy

### **The diaphyseal aseptic tibial non-union after failed previous treatment options managed with the reamed intramedullary locking nail**

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**T**ibial 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  $5\pm 0.8$  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.