Femoral Nonunion Exchange Nailing: Are we getting better results now?

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INTRODUCTION: While ~90% of femur fractures treated with intramedullary nail heal, 5-10% of patients fail initial treatment and progress to nonunion. One approach for treating femoral nonunions is through exchange nailing with reported union rates between 53-100%. These studies are based on small cohorts of patients with older implants, instruments, and techniques. The goal of our study was to evaluate rates of osseous healing and outcomes in femoral nonunions with contemporary exchange nailing.

METHODS: We retrospectively reviewed patients (age ³ 18) from five academic Level 1 trauma centers who sustained femur fractures (AO/OTA 31, 32, 33) initially treated with intramedullary fixation that developed nonunion and were treated with exchange nailing for the index nonunion surgery. The primary outcome measure was osseous union. We further analyzed union rate by AO/OTA classification, nonunion type, implants used, time from initial procedure, and infection status at time of indexed nonunion procedure. Standard demographic data was also obtained.

RESULTS: From a database of 1,959 long bone nonunions, we identified ninety-nine femurs in ninety-nine patients which met inclusion criteria. 68 of 99 femurs (69%) achieved union following initial exchange nail procedure. Rates of osseous union were similar by AO/OTA classification (p=0.36), nonunion type (hypertrophic, oligotrophic, atrophic) (p=0.58), implant/biologic used (p=0.15), and time from initial procedure until exchange nail procedure (p=0.18). Fifty-nine patients had inflammatory labs (CRP, ESR) and cultures obtained at time of first non-union surgery with no significant differences in union (p=0.57) based on lab and culture results. A considerable number of complications were encountered. 29 patients underwent subsequent re-operation (most secondary to continued nonunion), 20 were readmitted, 20 had persistent nonunion, 11 experienced hardware failure and 4 had a new infection.

DISCUSSION AND CONCLUSION: This large, multicenter study with modern implants, instruments, and techniques for exchange nailing femoral nonunions demonstrates disappointing rates of osseous healing (31% failure) consistent with the lower end of reported data in previous literature.