Tibial Nonunion Exchange Nailing Fails More than One Third of the Time

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INTRODUCTION: Tibia fractures are the most common long bone injuries sustained each year. Frequently, these fractures are treated with intramedullary fixation. The literature reports 5 to 10% of tibia fractures will progress to nonunion after intramedullary nailing. A common approach for treating tibial nonunions is through exchange nailing. The goal of our study was to evaluate rates of osseous healing in tibial nonunions treated with contemporary exchange nailing.

METHODS: We retrospectively reviewed patients (age ³ 18) from five academic Level 1 trauma centers who sustained a tibia fracture (AO/OTA 41, 42, 43) initially treated with intramedullary fixation that developed nonunions 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. Standard demographic data was also obtained.

RESULTS: From a database of 1,956 long bone nonunions, we identified 66 tibias in 66 patients which met inclusion criteria. Forty-three (65%) achieved osseous union after exchange nail procedure. Sixty-four of 66 patients within series sustained AO/OTA 42 type fracture. Rates of union were similar by nonunion type (hypertropic, oligotrophic, atrophic) (p=0.85), implant/biologic used (p=0.69), and time from initial procedure until exchange nail procedure (p=0.44). Forty-three patients had inflammatory labs (CRP, ESR) and cultures obtained at time of first nonunion surgery with no significant differences in union (p=0.48) based on lab and culture results. Complications documented included 15 patients who underwent subsequent reoperation (most secondary to continued nonunion), 11 were readmitted, 13 were diagnosed with new infection, 4 had persistent nonunion, and 3 experienced hardware failure.

DISCUSSION AND CONCLUSION: This large, multicenter study with modern implants, instruments, and techniques for exchange nailing tibial nonunions demonstrates disappointing rates of osseous healing (35% failure) consistent with the lower end of reported data in previous literature.