

**Nonunion Repair With Bone Graft Is a Durable Procedure:  
No Decay in Outcomes at 5 Years Following Surgical Treatment**

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**Purpose:** The purpose of this study is to compare long-term patient-reported outcomes to 1-year data for patients treated surgically for a long bone fracture nonunion to determine whether results stand over time.

**Methods:** 71 patients successfully surgically treated for a fracture nonunion with fixation and autogenous bone graft with follow-up greater than 5 years were prospectively followed. Data collected included baseline and follow-up pain scores measured by the visual analog scale (VAS), clinical outcomes assessed by the Short Musculoskeletal Functional Assessment (SMFA), and range of associated joint motion. The mean age of the cohort was 48.5 years and the mean length of follow-up was 7.8 years. 75% of patients in this study had lower-extremity fracture nonunions and 25% had upper-extremity fracture nonunions. Femur fracture nonunions were the most common. Data at latest follow-up was compared to 1-year follow-up using the independent t test.

**Results:** All patients had healed their nonunions and reported improvement in pain and function compared to baseline at 1 year. There were no differences in patient-reported outcomes between 1 year and latest follow-up according to the standardized total SMFA ( $P = 0.982$ ), functional index SMFA ( $P = 0.186$ ), bothersome index SMFA ( $P = 0.396$ ), activity index SMFA ( $P = 0.788$ ), emotional index SMFA ( $P = 0.923$ ), or mobility index SMFA ( $P = 0.649$ ). There was also no difference in reported pain ( $P = 0.534$ ). Range of joint motion data were collected for patients who followed up in clinic at least 5 years after their surgical treatment. 58% of these patients reported a slight increase in range of motion at 5 years.

**Conclusion:** Fracture nonunion repair is a durable procedure. Patient functional outcomes, range of motion, and reported pain all normalize by 1 year following surgical treatment for fracture nonunion and do not change at 5 years and beyond post-surgery. Surgeons do not need to follow up with fracture nonunion patients beyond 1 year barring pain or general complications and can provide patients this information with confidence.