

No Decay in Outcomes at a Mean 10 Years Following Surgical Treatment for Fracture Nonunion

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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.

Methods: 314 patients surgically treated for a fracture nonunion were prospectively followed. Data collected included pain scores measured by the visual analog scale (VAS), clinical outcomes assessed by the Short Musculoskeletal Functional Assessment (SMFA), and range of motion. 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: 71 patients were available for greater than 5-year follow-up data. There were no differences in patient-reported outcomes between 1 and 5 years 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 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: Patient functional outcomes, range of motion, and reported pain all normalize after 1 year following surgical treatment for fracture nonunion and do not change significantly 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.

Statistical analysis of SMFA and VAS scores at one year versus long-term (paired t-tests)

| Index | Mean One Year | Mean LTFU | Mean Difference | p-value |
|------------|---------------|--------------|-----------------|---------|
| Pain | 2.88 ± 2.65 | 3.17 ± 2.8 | -.289 | .534 |
| Total SMFA | 19.7 ± 20.4 | 19.6 ± 20.27 | .077 | .982 |
| Function | 19.2 ± 19.6 | 23.9 ± 22.7 | -4.72 | .186 |
| Activity | 25.8 ± 27.3 | 24.6 ± 28.8 | 1.27 | .788 |
| Arm & Hand | 5.59 ± 15.0 | 9.03 ± 17.0 | -4.31 | .110 |
| Mobility | 21.9 ± 23.5 | 23.7 ± 23.5 | -1.84 | .649 |
| Bother | 21.2 ± 25.3 | 17.9 ± 20.4 | 3.29 | .396 |
| Emotion | 21.7 ± 22.5 | 21.3 ± 20.8 | .352 | .923 |