

Long-Term Patient-Reported Outcome After Revision Surgery for Lower Extremity Nonunion: A Retrospective Cohort Study

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Purpose: Ongoing lower extremity nonunion is a devastating condition associated with substantial patient morbidity. To date, there has been limited evidence on physical and mental function after surgical management of lower extremity nonunion. The primary aim was to assess long-term general physical and mental health and lower extremity-specific physical function of patients who underwent surgery for a lower extremity nonunion, and to compare these outcomes with normative population data. The secondary aim was to assess the influence of patient, nonunion, and treatment characteristics on general health and physical function.

Methods: 135 adult patients who underwent surgical management for a lower extremity nonunion between 2002 and 2021 were evaluated at an average follow-up of 8.6 years (interquartile range [IQR]: 4-12). General physical and mental health was assessed with the Short-Form 12 (SF-12) physical (PCS) and mental (MCS) component summaries, and lower extremity-specific physical function with the Lower Extremity Functional Scale (LEFS). Multivariable linear regression was performed to identify variables that were independently associated with outcomes.

Results: The median LEFS was 50.0 (IQR: 37.25-63.0) and the median SF-12 PCS was 42.8 (IQR: 32.7-52.0), both of which are lower than normative population scores (LEFS: 77 and PCS 50.7, $P < 0.0001$). The median SF-12 MCS was 50.0, which is very close to the normative population score of 50.9 ($P < 0.0001$). The number of surgeries prior to the index nonunion treatment ($P = 0.018$ and $P = 0.041$) and the number of subsequent revision surgeries after the index nonunion treatment ($P = 0.022$ and $P = 0.041$) were both associated with lower LEFS and SF-12 PCS scores.

Conclusion: At an average of 8.6 years after lower extremity nonunion surgery, patients report lower general and lower extremity-specific physical functioning compared to the normative population. The number of surgical attempts to obtain healing is associated with lower physical function scores. Mental health scores may return close to normative population scores. These results can be used to inform patients, and guide treatment strategies and health-care policies.