

Long-Term Pulmonary Function, Thoracic Pain, and Quality of Life in Patients with 1 or More Rib Fractures

Jonne T.H. Prins, MD; Esther M.M. Van Lieshout, PhD;

Hidde Clemens Gerardus Overtom, BS; Yusuf S. Tekin, BS; Michael Verhofstad, MD;

Mathieu Wijffels, MD

Erasmus University Medical Center, Rotterdam, Netherlands

Purpose: This retrospective cohort study evaluated long-term pulmonary function, thoracic pain, and quality of life in patients admitted with rib fractures.

Methods: All patients admitted with one or more rib fractures between January 1, 2012 and December 1, 2019 were included. During one follow-up visit, pulmonary function was measured using spirometry and patients completed questionnaires on thoracic pain and quality of life. Patients were stratified by chest wall injury severity into one or two rib fractures, multiple rib fractures, or a flail chest. Multivariable analysis was performed to compare outcome after operative treatment with nonoperative treatment in patients with three or more rib fractures.

Results: In total, 300 patients were included. The median follow-up was 39 months (P25-P75, 18-65 months). At follow-up, the corrected forced vital capacity (FVC) returned to 84.7% (P25-P75, 74.3-93.7) and the forced expiratory volume in 1 sec (FEV1) to 86.3% (P25-P75, 75.3-97.0) of the predicted reference values. The median EuroQol 5 Dimensions 5-Level (EQ-5D-5L) utility score (US) was 0.82 (P25-P75, 0.66-0.92) and visual analog scale score was 75 (P25-P75, 70-85). The Short Form-12 version 2 (SF-12v2) physical and mental component summaries (PCS and MCS) were 45 (P25-P75, 38-54) and 53 (P25-P75, 43-60), respectively. This indicated a quality of life within normal population ranges. Moderate to severe thoracic pain, dyspnea in rest or during mild effort, and chest tightness were reported by 64 (21.3%), 70 (23.3%), and 48 (16.0%) patients, respectively. Long-term outcomes were similar for patients with one or two rib fractures, multiple rib fractures, or a flail chest. No difference in long-term outcomes between operative and nonoperative treatment was demonstrated.

Conclusion: While long-term pulmonary function and quality of life recover to normal values, subjective thoracic complaints such as pain and dyspnea remain frequently present in patients following rib fractures. No effect of chest wall injury severity or treatment modality on long-term outcomes was demonstrated.