

Long-term Patient Reported Symptom Improvement and Quality of Life Following Transthoracic Diaphragm Plication in Adults

Amanda R. Hunt, BA, BS¹, Christina M. Stuart, MD¹, Anna K. Gergen, MD¹, Anne E. Reihman, MD²,
Laura J. Helmkamp, MS³, Yihan Lin, MD, MPH⁴, John D. Mitchell, MD¹, Robert A. Meguid, MD, MPH¹,
Christopher D. Scott, MD⁵, Brandon M. Wojcik, MD⁶

¹ Division of Cardiothoracic Surgery, Department of Surgery, University of Colorado, Aurora, CO

² Critical Care and Pulmonary Sleep Associates, Aurora, CO

³ Adult and Child Consortium for Health Outcomes Research, University of Colorado School of Medicine,
Aurora, Colorado

⁴ Department of Cardiothoracic Surgery, Stanford University, Palo Alto, CA

⁵ Division of Cardiothoracic Surgery, Department of Surgery, University of Virginia, Charlottesville, VA

⁶ Division of Cardiothoracic Surgery, Department of Surgery, Munson Medical Center, Traverse City, MI

Introduction: Open and robotic-assisted transthoracic approaches for diaphragm plication are accepted surgical interventions for diaphragm paralysis and eventration. However, long-term patient-reported symptom improvement and quality of life (QOL) remains unclear.

Study Design: A telephone-based survey was developed focusing on postoperative symptom improvement and QOL. Patients who underwent open or robotic-assisted transthoracic diaphragm plication (2008-2020) across three institutions were invited to participate. Patients who responded and provided consent were surveyed. Likert responses on symptom severity were dichotomized and rates before and after surgery were compared using McNemar's test.

Results: 41% of patients participated (43/105 responded, mean age 61.0 years, 67.4% male, 37.2% robotic-assisted surgery), with an average time between surgery and survey of 4.1 ± 3.2 years. Patients reported significant improvement in dyspnea while lying flat (67.4% pre-op vs 27.9% post-op, $p < 0.001$), dyspnea at rest (55.8% pre-op vs 11.6% post-op, $p < 0.001$), dyspnea with activity (90.7% pre-op vs 55.8%

post-op, $p < 0.001$), dyspnea while bending over (79.1% pre-op vs 34.9% post-op, $p < 0.001$), and fatigue (67.4% pre-op vs 41.9% post-op, $p = 0.008$). There was no statistical improvement in chronic cough. 86% of patients reported improved overall QOL, 79% had increased exercise capacity, and 86% would recommend surgery to a friend with a similar problem. Analysis comparing open and robotic-assisted approaches found no statistically significant differences in symptom improvement or QOL responses between the groups.

Conclusion: Patients report significantly improved dyspneic and fatigue symptoms following transthoracic diaphragm plication, regardless of open or robotic-assisted approach. The majority of patients report improved QOL and exercise capacity.