Patterns of Physical Therapy Utilization Following Microdiscectomy

Maya S. Abu-Zahra BA[1], Daniel Rusu BS[1], Natalie Kistler BS[1], Aidan Lindgren BS[1], Marc A. Abdou MS[1], Ram K. Alluri MD[1], Justin M. Lantz DPT, OCS[2]
[1]Department of Orthopaedic Surgery, Keck School of Medicine of USC, Los Angeles, CA, United States
[2]Division of Biokinesiology and Physical Therapy, University of Southern California, Los Angeles, CA, United States
Email of Presenting Author: abuzahra@usc.edu

Disclosures: Maya S. Abu-Zahra (N), Daniel Rusu (N), Natalie Kistler (N), Aidan Lindgren (N), Marc A. Abdou (ATEC Spine), Ram K. Alluri (Orthofix, eCential Robotics, Globus, Medtronic, HIA technologies, NeoOnc, ATEC, Max BioPharma), Justin M. Lantz (Clinical Pattern Recognition LLC, SI-Bone Inc)

INTRODUCTION: Lumbar microdiscectomy (MD) is a minimally invasive surgery for symptomatic disc herniation that is refractory to conservative management. Physical therapy (PT) after microdiscectomy may aid recovery by initiating mobilization and strengthening, but optimal use and application of protocols remain unclear. This study investigates the frequency, timing, and predictors of PT utilization on a national, multi-center level following MD.

METHODS: The PearlDiver Mariner national database was used to identify patients undergoing MD from 2010–2022 using CPT codes. Patients were stratified using CPT codes for PT interventions specifically for ICD-9/10 diagnosis codes related to lumbar disc degeneration. Patients under 18, with malignancy, infection, trauma, rheumatoid arthritis, revisions within one year, or less than 1 year follow-up were excluded. PT utilization was assessed between 7-365 days postoperatively. Patient demographics, comorbidities, and preoperative PT utilization were collected. Statistical analyses included ANOVA, chi-squared tests, univariate and multivariate logistic regression to identify significant predictors of PT use.

RESULTS SECTION: Among 372,376 patients in this national cohort, 89,970 (24.2%) received postoperative PT following MD surgery. Patients utilizing PT were slightly younger (52.8±14.6 years), had higher comorbidity scores (ECI 3.31±2.92), and greater mean family income ($77,937±$21,722) (all p<0.001; Table 1). PT users were female (49.9%) and had markedly higher rates of preoperative PT (25.8% vs. 8.6%), which emerged as the strongest predictor of postoperative PT use (multivariate OR: 3.73). Other independent predictors included inpatient surgical status (OR: 1.19), advanced education (OR: 1.28), and comorbidities including obesity (OR: 1.35), osteoarthritis (OR: 1.43), fibromyalgia (OR: 1.49), and depression (OR: 1.29) (all p<0.001). Timing of PT initiation varied: 38% started PT within 6 weeks postoperatively, 68% by 12 weeks, and 100% by one year, with commercial insurance enabling the shortest time to PT (84.4±82.71 days) compared to Medicaid (100.6±88.07 days) and Medicare (97.6±88.1 days) (p<0.001). Surgical complexity also played a role, as multi-level procedures increased PT utilization (OR: 1.07), whereas single-level surgery was associated with lower PT use (OR: 0.94). Additionally, patients experiencing medical (OR: 1.24) or surgical complications (OR: 1.32) were more likely to engage in PT.

DISCUSSION: Postoperative PT after MD remains underutilized, with only 24% of patients engaging in therapy. Utilization varies by age, comorbidities, insurance, region, number of levels involved, and postoperative complications, with preoperative PT strongly predicting postoperative use. This retrospective analysis is limited by reliance on administrative data, which may not fully capture actual PT engagement or functional outcomes. Our findings highlight disparities and the need for standardized, equitable rehabilitation guidelines to optimize recovery.

SIGNIFICANCE/CLINICAL RELEVANCE: This study highlights significant disparities in postoperative PT utilization following MD, influenced by demographic, socioeconomic, and clinical factors. Understanding these predictors can guide the development of standardized, equitable rehabilitation protocols to optimize patient recovery and resource allocation.

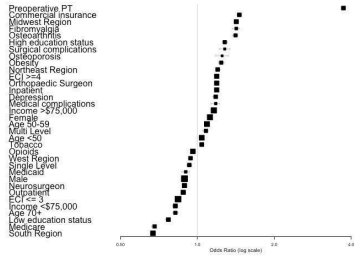

Figure 1. Forest plot depicting multivariate odds ratios for factors associated with postoperative PT utilization following MD.

	No Post-op PT	Post-op PT	p-value
	N=282,406 (75.8%)	N=89,970 (24.2%)	
Age	53.4 +/- 14.8	52.8 +/- 14.6	<0.001
ECI ≥ 4	90,259 (32.0%)	31,312 (34.8%)	<0.001
ECI ≤ 3	192,147 (68.0%)	58,658 (65.2%)	<0.001
Mean family income ($)	75,145 +/- 20,019	77,937+/-21,722	<0.001
Female	133,278 (47.0%)	44,891 (49.9%)	<0.001
Male	149,128 (53.0%)	45,079 (50.1%)	<0.001

Table 1. Demographics and PT Utilization of Patients Undergoing MD