

Posterior Micro-Endoscopic Discectomy vs. ACDF for Single-level Radiculopathy: Comparative Effectiveness and Cost-Utility Analysis

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Introduction

Cervical radiculopathy remains highly prevalent and costly in the U.S. healthcare system. While ACDF has remained the most

popular surgical treatment modality, minimally invasive advancements such as posterior micro-endoscopic

discectomy/foraminotomy(pMED) has emerged as a motion preserving and less invasive alternative. To date, the comparative effectiveness and cost-effectiveness of pMED vs. ACDF remains unclear.

Methods

Patients undergoing surgery for single-level radiculopathy without

myelopathy resulting from foraminal stenosis or foraminal disc

herniation without instability over a one-year period were

prospectively enrolled into an institutional database. Baseline, post

-operative 3-months, and 12-months VAS-Arm and Neck, NDI, EQ

-5D, and return to work(RTW) status were collected. Direct

healthcare cost(payer perspective) and indirect cost (work-day

losses multiplied by median gross-of-tax wage

Results

Total 20 ACDF and 28 pMED patients were identified. Baseline

demographics, symptomatology, and co-morbidities were similar

between the cohorts. For pMED vs. ACDF, mean length of surgery

(48.1±20.0 vs. 69.9±11.6 minutes, $p<0.0001$) and estimated blood

loss (20.3±9.3 vs. 31.8±15.4 mL, $p=0.04$) was reduced. There was

no 90-day morbidity or re-admission for either cohort. One(3.6%)

pMED patient required a subsequent ACDF; no patients in the

ACDF cohort required re-operation by one-year. pMED and ACDF

cohorts demonstrated similar improvement in arm -VAS(3.1 vs.

2.6, $p=0.66$), neck-VAS(2.0 vs. 3.2, $p=0.24$), NDI(9.0 vs.

6.8, $p=0.24$), and EQ-5D(0.17 vs. 0.15, $p=0.82$). Ability to

RTW(93.8% vs. 94.1%, $p=1.0$) and median time to RTW(3.7[0.9-

8.1] vs. 3.6[2.1-8.5] weeks, $p=0.85$) were similar.

Learning Objectives

The comparative-effectiveness and cost-effectiveness research

have emerged as an important tool to determine value of spine

care by merging patient-centered outcomes with responsible use

of societal health care resources. To date, the comparative

effectiveness and cost effectiveness of pMED vs. ACDF remains

unclear. In this study, we demonstrate that for single-level

unilateral-radiculopathy resulting from foraminal stenosis or lateral

disc herniation without segmental instability, pMED was equivalent

to ACDF in safety and effectiveness, however pMED had

significant cost saving benefit compared to ACDF.