

Within-subject Changes to Swallowing Metrics after Anterior Cervical Discectomy and Fusion Surgery

INTRODUCTION

Anterior cervical discectomy and fusion (ACDF) is a surgical procedure to correct pain, weakness, or numbness associated with herniated discs and/or degenerative disc disease. After damaged discs are removed, grafts/fillers are fixed in place with metal plates and screws (Figure 1). Unfortunately, this surgery places the muscles and the nerves of the pharynx at risk and can result in dysphagia¹.



Figure 1 Lateral view of hardware in situ after a multi-level ACDF surgery

The proportion of patients reported to experience dysphagia post-ACDF varies widely in part due to differences and inadequacies in the methods/metrics for capturing dysphagia². A 2017 systematic review of 59 studies reporting risk factors for dysphagia after ACDF, more than 65% of the studies used subjective patient compliant to identify dysphagia³.

The aim of this study was to quantify within-subject changes to swallowing before and 4 weeks after ACDF surgery at NYU Health using dysphagia-specific metrics.

METHODS

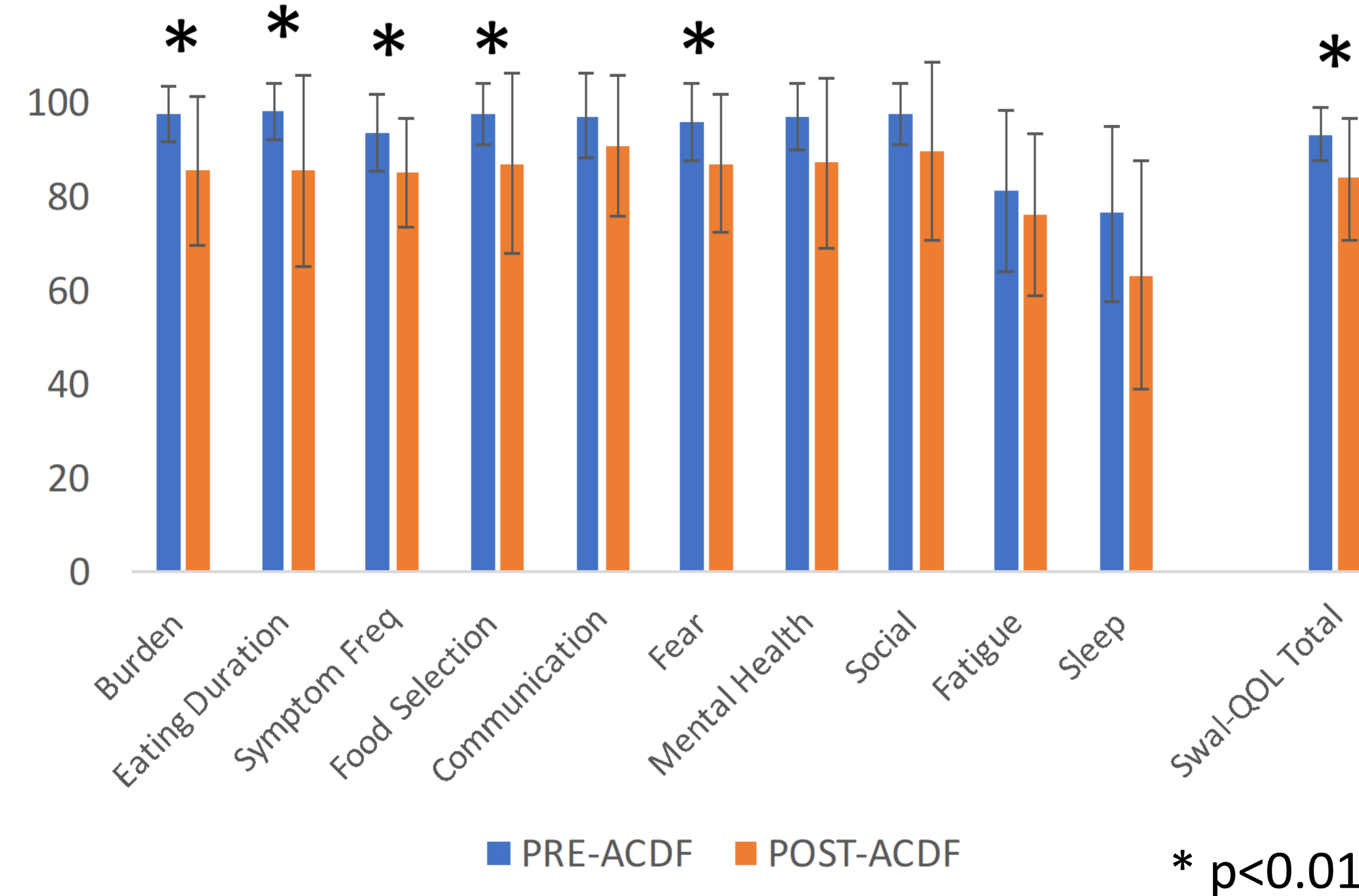
Participants: 35 patients (23 male, mean age=52.7, SD=10.4) were prospectively enrolled in this study. The most common surgical levels included C5-C7 (16/35), C4-C6 (8/35) and C4-C7 (5/35).

Outcome measures (pre-ACDF and 4 weeks post-ACDF)

- Swallowing Quality of Life Questionnaire (Swal-Qol)⁴
- Eating Assessment Tool (EAT-10)⁵
- Functional Oral Intake Scale (FOIS)⁶

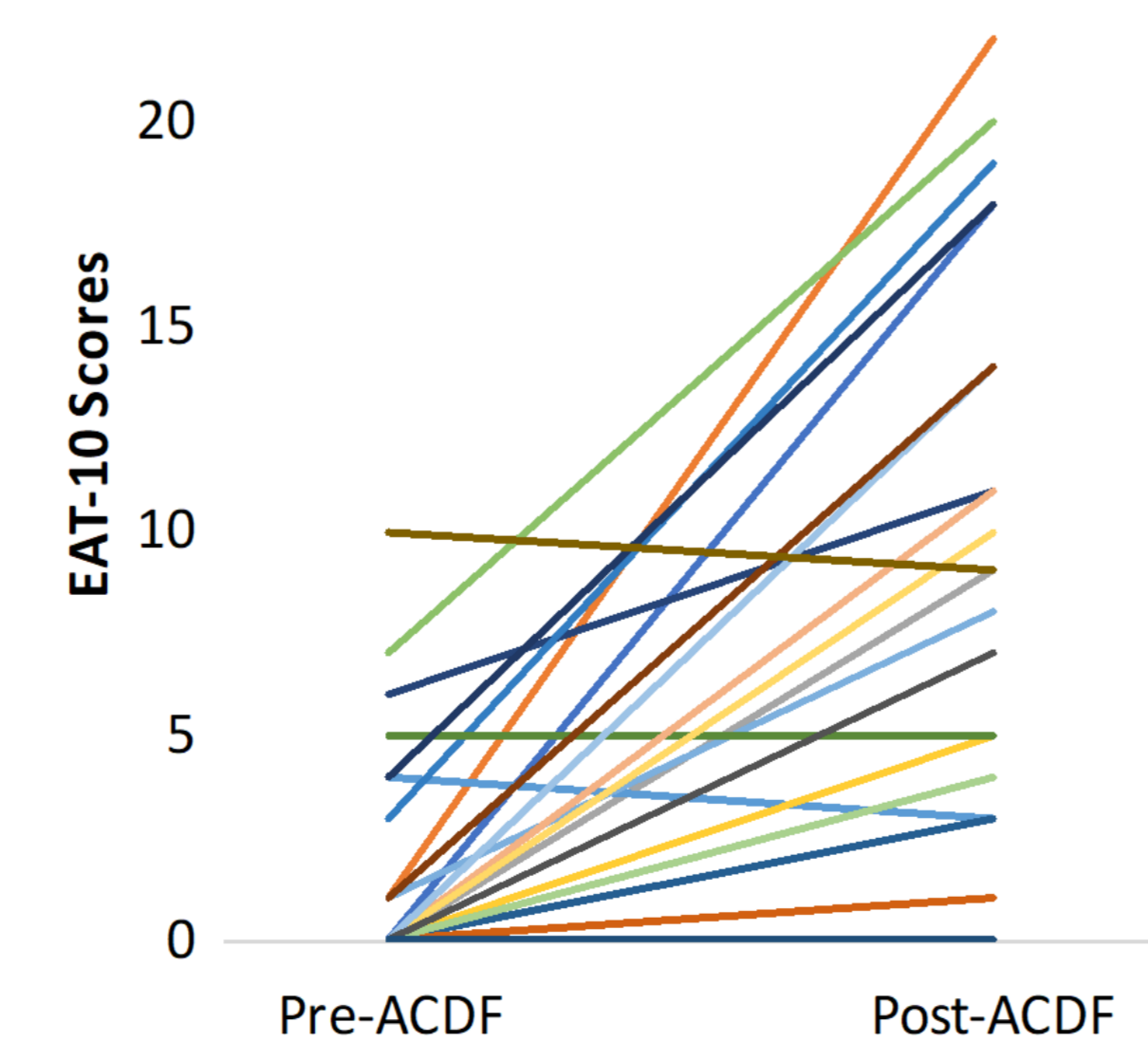
Statistical Analysis: McNemar Chi Square tests examined the change in distribution of abnormal EAT-10 scores (>3) pre- vs post-ACDF. Paired t-tests compared SWAL-QOL scores (overall and individual domains) pre- vs post-ACDF. Wilcoxon Signed Rank Test examined the change in distribution of FOIS scores pre-ACDF to discharge. P<0.01 was considered significant to control for multiple comparisons.

RESULTS: SWAL-QOL



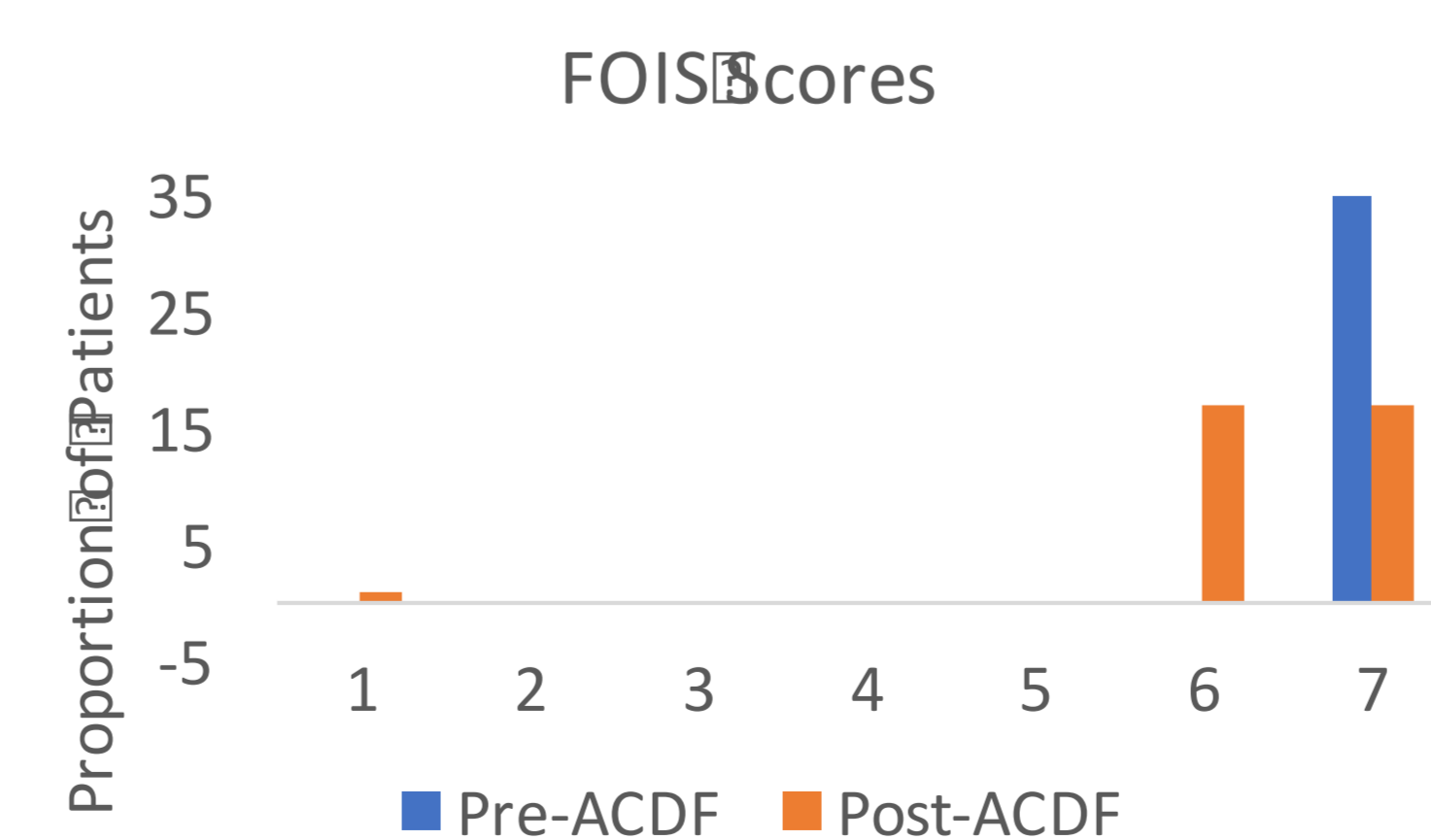
RESULTS: EAT-10

	Pre-ACDF	Post-ACDF
Mean	1.2	7.8
Median	0	7
SD	2.4	6.6
EAT-10 >3	6/35=17%	24/35=69%
p value	<0.001	



RESULTS: FOIS

	Pre-ACDF	Post-ACDF
Mean	7.0	6.3
Median	7	6
SD	0.0	1.1
p value	<0.001	



DISCUSSION POINTS

- The existing ACDF literature largely relies on using non-validated, subjective questionnaires to diagnose dysphagia (see for example the Bazaz scale⁷).
- This prospective, within-subject analysis using validated swallowing PROs and diet scales confirms that a large proportion of patient at our institution experience a significant disruption to swallowing function and quality of life post-ACDF.

LIMITATIONS & FUTURE DIRECTIONS

- Lack instrumental evaluations of swallowing
- Relatively small sample
- Limited to one post-surgical time point

This work will set the stage for future investigations into the pathophysiology of dysphagia post-ACDF with gold-standard imaging in collaboration with the neurosurgery team at our institution.

Our long-term goal is to track swallowing physiology using videofluoroscopy at multiple time points post-ACDF surgery.

REFERENCES

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