

Additional file 6: Outcome measurement instruments

Outcome	Measurement
Death	N/S
Oropharyngeal dysphagia severity	VFS: DOSS (O'Neil et al., 1999); FDS (Han et al., 1999); VDS-total; -oral; -pharyngeal (Kim et al., 2012) FEES: score 0-108; sum of 5 scores; sum of 4 scores Dysphagia scale (no reference, from Wei et al. 2017); SSA (Perry et al., 2001); CSE
Drooling	UPDRS II: 5-point scale DSFS: 5- and 4-point scale (Thomas-Stonell & Greenberg, 1988)
Salivary pooling	FEES: 4-point scale
Orolingual bolus control	VFS: 5-point scale FEES: 3-point-scale, 5-point scale
Oral bolus transport	VFS: 3-point scale
Swallowing related lingual movement	VFS: 5-point scale
Timing of oropharyngeal swallow components	VFS FEES: 4-point scale
Laryngeal elevation	FEES: 3-point scale
Laryngeal sensation	FEES: touching epiglottis or arytenoids with endoscope, 4-point scale
Swallowing related hyoid bone movement	VFS: in milli- or centimeters
Initiation of pharyngeal swallow	VFS: 3-point scale FEES: endoscopic whiteout, 4-point scale; 3-point scale EMG (submental muscles) in milliseconds
Postswallow oral residue	VFS: 5-point scale
Postswallow pharyngeal residue	VFS: 3-point scale FEES: 4-point scale; 5-point scale
Postswallow pharyngeal pooling	VFS: 3-point scale FEES: 3-point scale
Piecemeal deglutition	VFS: 5-point scale FEES: 5-point scale
Penetration/Aspiration	VFS: PAS, 8-point scale (Rosenbek et al., 1996) FEES: PAS, 8-point scale (Rosenbek et al., 1996); penetration/aspiration before/after swallowing, 4-point scale
Cortical reorganization	Magnetoencephalography: data filtered within theta (4–8 Hz), alpha (8–13 Hz), beta (13–30 Hz), low-gamma, (30–60 Hz), high-gamma (60–80 Hz) frequency bands; in all frequency bands, performance of source localization of each subject's swallowing-associated event-related desynchronization (ERD) of cortical rhythms
Motor evoked potential	Electromyography
Overall motor symptoms	H&Y; UPDRS III

Tremor	UPDRS III
Rigidity	UPDRS III
Bradykinesia	UPDRS III
Axial symptoms	UPDRS III
Freezing of gait	Stand-walk-test (no reference, from Xie et al., 2018)
Phonation	Maximum phonation time on /aa/ in seconds
Loudness	Maximum phonation decibel (dB) on /aa/
Level of oral intake	FOIS (Crary et al., 2005)
Aspiration pneumonia	Chest radiography Clinical evaluation: ≥ 3 of the following: sustained fever (temperature $> 100^{\circ}\text{F}$ [38°C]), rales or rhonchi on chest auscultation, sputum Gram stain showing substantial leukocytes, or sputum culture showing a respiratory pathogen
Activities of daily living	IADL (Lawton et al., 1969)
Pleasure of oral intake	POE (Manor et al., 2013)
Swallowing related quality of life	SWAL-QOL (McHorney et al., 2002), MDADI (Chen et al., 2001)
Self-perception of swallowing	SDQ (Manor et al., 2007), DSS (Tohara et al., 2003), A-DHI (Farahat et al., 2014)
Self-perception of walking	FOG questionnaire (Giladi et al., 2009)
Self-perception of activities of daily living	Activities of Daily Living Scale (Brown et al., 1989)
Patient's satisfaction with intervention	Interview: rated as easy/pleasant, average, or difficult/unpleasant SWAL-CARE (McHorney et al., 2002)
Patient's adherence to intervention	Assessed across meals, classified monthly as 0% - 25%, 26% - 50%, 51% - 75%, or 76% - 100%
Hospitalization	N/S
Adverse events	Clinical evaluation

A-DHI = Arabic Dysphagia Handicap Index, CSE = Clinical Swallow Evaluation, DOSS = Dysphagia Outcome and Severity Scale, DSFS = Drooling Severity and Frequency Scale, DSS = Dysphagia Severity Scale, EMG = Electromyography, FDS = Functional Dysphagia Scale, FEES = Fiberoptic Endoscopic Evaluation of Swallowing, FOG = Freezing of Gait, FOIS = Functional Oral Intake Scale, H&Y = Hoehn & Yahr, IADL = Instrumental Activities of Daily Living, MDADI = MD Anderson Dysphagia Inventory, N/S = not specified, PAS = Penetration-Aspiration-Scale, POE = Pleasure of Eating, SDQ = Swallowing Disturbance Questionnaire, SSA = Standardized Swallowing Assessment, SWAL-CARE = Swallowing Quality of Care Questionnaire, SWAL-QOL = Swallowing Quality of Life Questionnaire, UPDRS = Unified Parkinson's Disease Rating Scale, VDS = Videofluoroscopic Dysphagia Scale, VFS = Videofluoroscopic Evaluation of Swallowing