Case Report

Evaluation of Baclofen on Speech Production in Post-Stroke Laryngeal Tension Dysphonia and Spastic Dysarthria: A Case Report

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ABSTRACT

Objectives: Communication deficits following stroke are prevalent and often debilitating. While conventional speech rehabilitative strategies by speech-language pathologists remain the mainstay of therapy, pharmacological adjuncts that facilitate oromotor and phonatory function may further enhance recovery. This case report describes the use of oral baclofen as an adjunct to conventional speech therapy in a post-stroke patient with severe dysarthria. It also illustrates how the Frenchay Dysarthria Assessment (FDA) can sensitively capture functional changes beyond standard bedside evaluation.

Case description: A 64-year-old English-speaking male with no significant comorbidities presented with a right middle cerebral artery (MCA) infarct which occurred in the context of cerebral amyloid angiopathy for which he underwent successful thrombectomy. He suffered from severe motor speech impairment, including dysphonia and dysarthria. Nasoendoscopy revealed normal vocal cord structure and movement, suggesting laryngeal tension dysphonia. During the initial 10 days of conventional speech-language therapy without baclofen, there was minimal improvement in his speech production as assessed by the same speech-language pathologist using the Perceptual Dysarthria evaluation. Given the persistent oromotor and laryngeal muscle hypertonicity, oral baclofen was introduced to address suspected spastic contributions to the dysarthria and dysphonia.

Results: Over one month, the patient completed 22 structured speech therapy sessions. Following baclofen initiation, the FDA, administered before and after treatment, demonstrated noticeable improvements in multiple domains: lip seal function, lip spread in speech, jaw function in speech, palatal muscle function in speech, and tongue muscle function in protrusion, lateral movement, and speech. Speech intelligibility also improved.

Conclusions: This case highlights the potential of oral baclofen as an adjunctive agent in modestly improving speech production, articulation clarity, and intelligibility post-stroke, and underscores the clinical utility of the Frenchay Dysarthria Assessment in detecting oromotor improvements. Further studies are needed to determine the reproducibility and efficacy

Keywords: baclofen, dysarthria, tension, dysphonia, stroke
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Introduction

The ageing global population has driven an increased incidence of stroke, one of the leading causes of adult mortality and disability, often resulting in communication impairments include aphasia, cognitive-communication deficits, and motor speech disorders such as apraxia and dysarthria, with incidence reaching 60.0%.[1] According to the American Speech-Language-Hearing Association, up to 58.0% of acute stroke survivors experience dysarthria.[2] In a secondary UK analysis by Mitchell et al., 28.0% of patients with acute-phase stroke had dysarthria and aphasia.[3] A study from Bosnia and Herzegovina found that 57.7% of stroke patients had dysarthria, of which 82.4% had concomitant aphasia.[4]

Speech impairments significantly impact patients' quality of life by limiting communication, emotional expression, social participation, and increasing the risk of psychological complications.[5] Standard rehabilitation involves individualized speech-language therapy, focusing on articulation, phonation, and respiratory control.[6-8] However, the use of pharmacologic agents targeting muscle tone and spasticity remains limited in speech rehabilitation. Baclofen, a gamma-aminobutyric acid type B (GABA-B) receptor agonist, reduces spasticity by inhibiting excitatory neurotransmission at spinal and supraspinal levels. Its potential to modulate hypertonicity in oromotor and laryngeal musculature may facilitate improved phonation and articulation.

Despite the theoretical rationale, there are no published reports on the use of oral baclofen to enhance speech intelligibility post-stroke for patients with spastic dysarthria or laryngeal tension dysphonia. There is also a lack of medical treatments for post-stroke patients to improve speech function.

This case aims to demonstrate the potential adjunctive benefit of oral baclofen in post-stroke speech rehabilitation

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beyond conventional speech therapy, and the utility of the FDA in capturing functional oromotor changes that may not be evident on standard clinical examination.

This case report was prepared in accordance with the local legislation and institutional requirements. The participant provided written informed consent to participate in this report. Written informed consent was obtained from the individual for the publication of any potentially identifiable images or data included in this article. The reporting of this case adheres to the CARE guidelines.

Patient information

The patient was a 64-year-old English-speaking male with no significant medical history. He sustained a right middle cerebral artery infarct involving the right insular and opercular segments of the rolandic branch, in the context of cerebral amyloid angiopathy. He underwent mechanical thrombectomy with same-day intubation, followed by successful extubation. After stabilisation in the stroke unit, he was transferred to inpatient rehabilitation at a tertiary hospital.

Upon admission to rehabilitation, neurological examination revealed Medical Research Council (MRC) grade 4 motor power in the major muscle groups of the left upper and lower limbs, and mildly reduced sensation on the left side. Power and sensation on the right side remained intact. Notably, the patient exhibited severe speech motor disorders, including severe laryngeal tension dysphonia and spastic dysarthria, characterized by strained voice, slow rate of speaking, imprecise consonants, and apraxia of speech (AOS), characterized by inconsistent speech-sound errors across repeated attempts at the same word or phoneme, awareness of errors with unsuccessful attempts at self-correction due to impaired motor planning, groping behaviours, and markedly increased errors during multisyllabic sequences. Given the severity of the dysphonia and the recent intubation, an otolaryngological evaluation was obtained to exclude mechanical vocal cord trauma. Nasoendoscopy revealed intact vocal cords with normal appearance and mobility, suggesting laryngeal tension dysphonia rather than structural injury.

The FDA is the most commonly employed formal assessment tool among speech-language pathologists to evaluate the presence, type, and severity of dysarthria. It is known for its strong clinical utility and inter-rater reliability and can provide an objective assessment of the individual's progress.[9,10]

A baseline FDA revealed absent lip seal function, reduced lip and jaw function during speech, absent palatal muscle function, and impaired laryngeal muscle function affecting pitch and volume control. Tongue function was reduced in protrusion, elevation, lateral movement, and in speech. The patient exhibited significantly reduced speech intelligibility, with absent intelligibility at word, sentence, and conversational levels (Table 1). These findings supported a diagnosis of spastic dysarthria with co-existing AOS.

Timeline of inpatient rehabilitation

Day 1-10: Standard inpatient speech therapy began upon admission to inpatient rehabilitation.

Day 11: Oral baclofen 5 mg twice daily was initiated to address oromotor and laryngeal spasticity.

Day 34 (23 days after baclofen initiation): Repeat FDA was performed prior to inpatient discharge.

Pre-Baclofen, the patient's voice volume during vowel sound production was low and hoarse, as illustrated in Supplementary video 1. Spastic dysarthria features (strained voice, slow rate, imprecise consonants) remained severe.

Table 1. Frenchay Dysarthria Assessment prior to baclofen

		REFLEX			RESPIRATION		LIPS				
Normal Function	a										
	b										
	c										
	d										
No Function	e										
		Cough	Swallow	Dribble/Drool	At Rest	In Speech	At Rest	Spread	Seal	Alternate	In Speech

		JAW		SOFT PALATE			LARYNGEAL			
Normal Function	a									
	b									
	c									
	d									
No Function	e									
		At Rest	In Speech	Fluids	Maintenance	in Speech	Time	Pitch	Volume	In Speech

		TONGUE					INTELL		
Normal Function	a								
	b								
	c								
	d								
No Function	e								
		At Rest	Protrusion	Elevation	Lateral	Alternate	In Speech	Words/ Repetition	Sentences/ Description	Conversation

Intervention

The patient underwent 22 sessions of speech therapy during inpatient rehabilitation. Treatment methods were the same pre- and post-baclofen, incorporating voicing exercises and speech tasks, including /u/phonation with gentle phonation, counting exercises, production of simple words, and repetition of the patient's name. Key components of speech therapy interventions were as follows:

• Clear speech strategies involved producing "ah" with diaphragmatic breathing and over-articulating words.

• Devoiced vowel articulation practice focused on the production of vowel sounds. When the patient was unable to produce these sounds independently, the speech-language pathologist provided modelling for the correct articulation.

• Semi-occluded vocal tract exercises included humming of /m/ and /u/ sounds, bubble blowing through a straw, and exhalation through a party blower.

• Respiratory exercises with phonoarticulatory coordination involved repeating "oo", "ee", and "aa" five times, with speech-language pathologists modelling and prompting when the patient demonstrated inappropriate voicing during inhalation.

The patient underwent daily speech therapy for 10 days without baclofen, but functional improvement was minimal. AOS persisted with continued inconsistent errors on repeated productions, largely ineffective self-correction attempts, and disproportionate breakdown during multisyllabic word production.

Baclofen 5 mg twice daily was initiated on day 11 of the patient's inpatient rehabilitation admission to target spasticity affecting the oromotor and laryngeal muscles contributing to dysarthria. A reduced dose of 5 mg was administered to minimise sedation risk in this patient with cortical stroke, aiming to achieve mild neuromuscular relaxation while preserving participation in speech and physical therapy.

Baclofen is a GABA-B receptor agonist commonly utilised for post-stroke spasticity. Upon binding to GABA-B receptors, baclofen initiates a cascade of intracellular signalling events that inhibit presynaptic neurotransmitter release through multiple mechanisms. This effect decreases synaptic transmission and neuronal excitability, thereby ameliorating spasticity.

Results

An FDA was repeated 23 days after initiating baclofen and prior to inpatient discharge. The results revealed improvements in several areas: lip function in seal and speech; jaw function in speech; palatal muscle function in speech; and tongue muscle function in protrusion, lateral movement, and speech. Additionally, intelligibility improved in speech, in words, and in conversation. However, no improvement was observed in laryngeal muscles in pitch, volume, or in speech, nor in the elevation of the tongue. Intelligibility in sentences remained unchanged (Table 2).

A comparison of Tables 1 and 2 is shown in Table 3. The deterioration in lip movement at rest, laryngeal movement in time, tongue movement at rest, and elevation after baclofen initiation may be due to intra-rater subjectivity during the two assessments rather than actual clinical decline. Overall, the post-baclofen FDA improvements demonstrated convincing evidence of improvement in speech.

A video recorded after administration of one dose of baclofen demonstrated increased vowel loudness and improved tongue mobility: Supplementary video 2.

While speech apraxia and word-finding difficulties persisted, the patient's speech initiation improved, with increased volume,

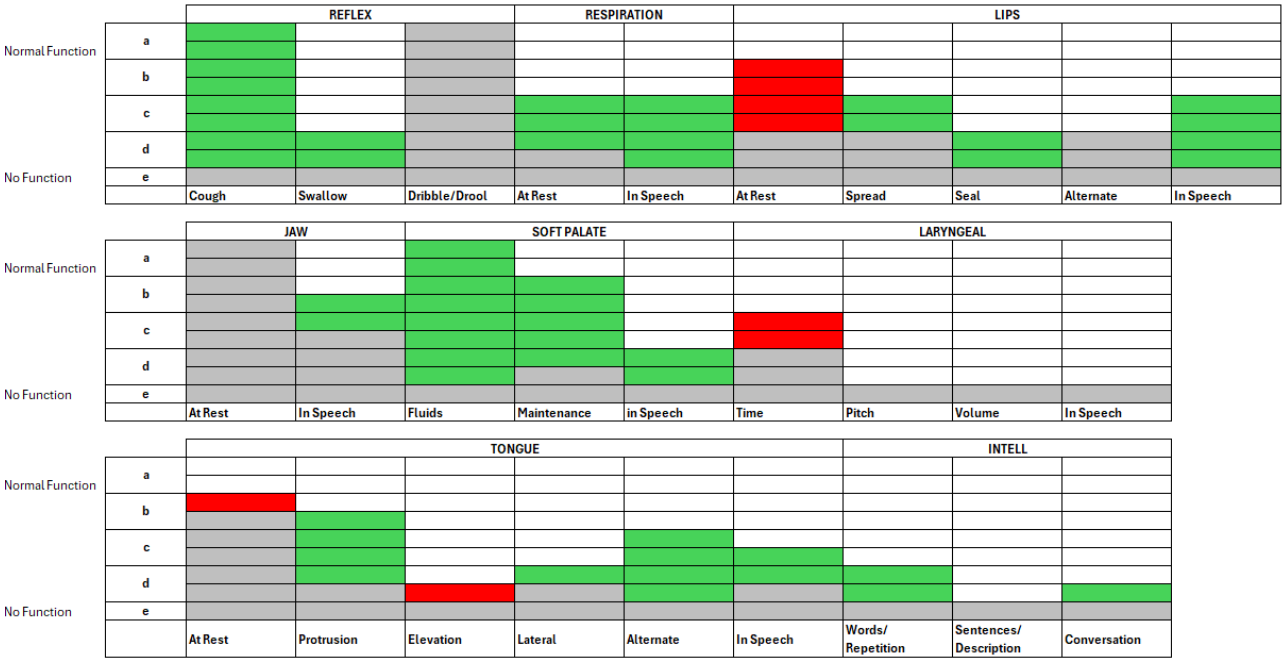
Table 2. Frenchay Dysarthria assessment 23 days after baclofen initiation, prior to discharge

		REFLEX			RESPIRATION		LIPS				
Normal Function	a										
	b										
	c										
	d										
No Function	e										
		Cough	Swallow	Dribble/Drool	At Rest	In Speech	At Rest	Spread	Seal	Alternate	In Speech

		JAW			SOFT PALATE		LARYNGEAL			
Normal Function	a									
	b									
	c									
	d									
No Function	e									
		At Rest	In Speech	Fluids	Maintenance	in Speech	Time	Pitch	Volume	In Speech

		TONGUE					INTELL			
Normal Function	a									
	b									
	c									
	d									
No Function	e									
		At Rest	Protrusion	Elevation	Lateral	Alternate	In Speech	Words/ Repetition	Sentences/ Description	Conversation

Table 3. Comparison of Frenchay Dysarthria Assessments pre- and post-baclofen; Green signifies improvement, Red signifies deterioration



greater articulatory movements, and enhanced intelligibility. Notably, voice strain was markedly reduced (Supplementary video 3), demonstrating reduced muscle rigidity. The patient did not demonstrate separate oral-motor apraxia, as non-speech oral movements (e.g., tongue protrusion) improved alongside speech functions. Post-baclofen, the patient demonstrated notable improvements in dysarthria and AOS. There was decreased strain and improved phonatory quality, and conversational intelligibility noticeably improved. There were also fewer inconsistent speech sound errors, fewer groping articulatory movements, and more effective attempts at self-correction. These improvements suggest that baclofen reduced hypertonicity of the laryngeal muscles, thereby improving conditions for apraxia training and facilitating more effective motor speech execution.

Discussion

This case highlights two key clinical insights:

1. The potential adjunctive role of oral baclofen in facilitating speech recovery post-stroke, and
2. The sensitivity of the FDA in quantifying incremental oromotor improvements during rehabilitation.

Conventional rehabilitation alone may not fully address hypertonicity within the laryngeal and articulatory musculature. Baclofen's enhancement of GABAergic inhibition can theoretically reduce excessive muscular tone, improving articulatory movements and phonation. The timing of improvement following baclofen initiation, captured by the FDA reassessment, suggests an additive benefit beyond spontaneous recovery and rehabilitative strategies.

The FDA provided a structured, quantifiable method for tracking changes across speech subsystems (lips, jaw, palate, tongue, and larynx). Compared with subjective bedside observation, the FDA allowed objective documentation of improvements in articulatory precision and range of movement, particularly in the orofacial musculature. In English-speaking patients, use of the original English version avoids confounding by linguistic translation. Nonetheless, clinicians should be cautious when generalizing results to non-English speakers whose phonetic demands differ.

Co-existing AOS complicates outcomes, as planning and sequencing deficits may mask improvements in muscle control. In this case, baclofen may have indirectly benefited apraxia rehabilitation by reducing laryngeal tension and enhancing phonatory feedback, enabling more precise articulation and facilitating motor learning. Importantly, no detrimental effect on motor planning was observed.

Currently, baclofen is primarily indicated for the management of spasticity post-stroke. In post-stroke patients with laryngeal tension dysphonia, spastic dysarthria, and reduced coordination within the laryngeal and articulatory subsystems, these impairments may compromise phonation and speech precision. Baclofen's capacity to modulate excessive neuromuscular excitability provides a theoretical basis for its consideration in residual oromotor spasticity which is unresponsive to conventional therapy. Thus, although not a standard post-stroke medication, its off-label use may be appropriate in carefully selected patients whose speech impairment has a dominant spastic component.

Post-stroke patients with dysphonia are typically managed as outpatients in the otolaryngology voice clinic. Standard practice involves a six-week trial of speech therapy before otolaryngologists consider botulinum toxin injection into the laryngeal muscles. Spasmodic dysphonia, characterized by involuntary spasms of the laryngeal muscles, is usually treated with botulinum toxin injection under laryngeal electromyography or flexible endoscopic guidance, coupled with

voice therapy. Management of spastic dysphonia follows a similar approach.

Baclofen was introduced during the pre-injection interval as a non-invasive pharmacologic alternative to reduce muscular hypertonia and optimize the patient's response to concurrent speech therapy. The decision to use baclofen rather than proceed directly to botulinum toxin was guided by the patient's potential for reversible neuroplastic changes and to avoid procedural risks during the early rehabilitation phase.

Evidence for baclofen in dysphonia and dysarthria remains limited. In a case study by Leary et al., a 40-year-old male with cerebral palsy (CP) and severe spastic dysarthria demonstrated measurable improvements in speech intelligibility following initiation of intrathecal baclofen (ITB). Improvement was observed in single-word production and complete sentence accuracy, as assessed by the Assessment of Intelligibility of Dysarthric Speech. These improvements were sustained six months after pump implantation.[11] Similarly, Mason et al. reported significant gains in speech intelligibility in a 28-year-old male with CP treated with ITB.[12]

Beyond individual case reports, a pilot study by Kristie et al. examined the effects of ITB on speech in children with cerebral palsy-related spasticity.[13] Outcomes were variable, with some children demonstrating improvement while others experienced deterioration in speech performance. A subsequent critical review by Anderson concluded that the overall evidence supporting ITB as a means of improving speech in CP remains weak and largely anecdotal.[14]

More recently, Madhav et al. conducted a cross-sectional study evaluating the use of oral baclofen as an adjunct to voice therapy in patients with primary muscle tension dysphonia. The study found no significant differences in voice-related psychometric outcomes between patients receiving baclofen and those managed with voice therapy alone.[15]

In this patient, results from the FDA demonstrated overall improvements in speech production, potentially attributable to relaxation of oromotor and laryngeal muscles. Nonetheless, multiple confounding factors must be considered when evaluating speech improvement, including natural post-stroke recovery, concurrent speech-language pathology interventions incorporating oromotor exercises, and communication training protocols.

Despite limited evidence in the stroke population, these studies collectively support baclofen's role in reducing oromotor hypertonicity, which may be extrapolated to post-stroke dysarthria characterized by similar pathophysiology. This case, therefore, provides preliminary clinical insight into a potential therapeutic avenue for addressing spastic dysarthria and laryngeal tension dysphonia in post-stroke patients.

Conclusions

This case report provides preliminary evidence that oral baclofen, when combined with standard speech-language therapy, may enhance articulatory and phonatory outcomes in post-stroke spastic dysarthria and AOS. This treatment could be beneficial in an acute inpatient setting, where early intervention is critical for optimizing functional recovery. The Frenchay Dysarthria Assessment is a sensitive tool for documenting subtle yet clinically meaningful improvements that are not readily captured by standard examination. Further controlled studies are needed to clarify baclofen's role, optimal timing, and patient selection in post-stroke speech rehabilitation.

Conflict of interest declaration

The authors declare that the case report was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Generative AI declaration

The authors confirm that no large language models (LLMs) or artificial intelligence (AI) tools were used in the creation of this manuscript, including the writing, editing, or preparation of figures and tables, with the exception of language and grammar improvement.

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Data availability statement

The original contributions presented in the study are included in the article/Supplementary Material; further inquiries can be directed to the corresponding author.

Author contributions

Lau Tsui Nam Trier: writing - original draft, Information and data gathering, Video filming. Writing- review and editing,

Joon Sin Ser: writing - original draft, Information and data gathering, Writing- review and editing,

San San Tay: writing - original draft, Information and data gathering, writing- review and editing.

Supplementary materials

The following supporting information can be downloaded:

The supplement video_1 file (MP4 format) is available at: https://drive.google.com/file/d/1xBsuw-yGbsTGs7mM0UL-rt-fD7-_b3JN/view?usp=sharing

The supplement video_2 file (MP4 format) is available at: https://drive.google.com/file/d/1EYRyX_OsIRdQ2V8zSM-wHXoiYEOCgO57l/view?usp=sharing

The supplement video_3 file (MP4 format) is available at: https://drive.google.com/file/d/1BrnHEsCYEWfPNIsPciRm7VLGtotAsxAo/view?usp=sharing

References

1. Zahra G, Reza N, Narges B, Samaneh SN, Masoud M, Tabassom A. The Incidence of Aphasia, Cognitive Deficits, Apraxia, Dysarthria, and Dysphagia in Acute Post Stroke Persian Speaking Adults. Indian J Otolaryngol Head Neck Surg. 2022;74(Suppl 3):5685-95.
2. Dysarthria in adults American Speech-Language-Hearing Association (ASHA) (2020). Available from: https://www.asha.org/practice-portal/clinical-topics/dysarthria-in-adults/#collapse_1
3. Mitchell C, Gittins M, Tyson S, Vail A, Conroy P, Paley L et al. Prevalence of aphasia and dysarthria among inpatient stroke survivors: describing the population, therapy provision and outcomes on discharge. Aphasiology 2021;7:950-96.
4. Vidović M, Sinanović O, Šabaškić L, Hatičić A, Brkić E. Incidence and types of speech disorders in stroke patients. Acta Clin Croatica. 2011;50(4):491-3.
5. João FO, Daniel ES, Pedro ES, Nuno M, Margarida A, Ana MF et al. Depression after stroke. Pract Neurol. 2021;21:384-91.
6. Nan H, Kang Z, Fang L, Zhen S, Long C, Yanbiao Z et al. Research trends and hotspots in post-stroke speech rehabilitation: A bibliometric analysis. Acta Psychol (Amst). 2025;254:104781.
7. Rita C, Michele V. Dysarthria and stroke. The effectiveness of speech rehabilitation. A systematic review and meta-analysis of the studies. Eur J Phys Rehabil Med. 2021;57:24-43.
8. Claire M, Sabrina EK, Martha DZ, Audrey B, Paul C, Brooke-Mai W et al. How do we measure dysarthria after stroke? A systematic review to guide the core outcome set for dysarthria. BMJ Open. [cited 2025 May 23];15(5):e099662. Available from: https://pmc.ncbi.nlm.nih.gov/articles/PMC12104885/ doi: 10.1136/bmjopen-2025-099662
9. Pamela ME. Frenchay dysarthria assessment. International Journal of Language & Communication Disorders. 1980;3:165-173
10. Abeer MA, Shin YC, Rahayu BMK, Rogayah AR. A Report of Assessment Tools for Individuals with Dysarthria. The Open Public Health Journal. [cited 2019 Sep 30];12: 384. Available from: https://openpublichealthjournal.com/VOLUME/12/PAGE/384/ doi: 10.2174/1874944501912010384
11. Leary SM, Gilpin P, Lockley L, Rodriguez L, Jarrett L, Stevenson VL. Intrathecal baclofen therapy improves functional intelligibility of speech in cerebral palsy. Clin Rehabil. 2006;20(3):228-31.
12. Mason C, Gilpin P, McGowan S and Rossiter D. The effect of intrathecal baclofen on functional intelligibility of speech. Int. J. Language and communication disorders 1988;33(Suppl): 24-25
13. Kristie FB, John FM, John DL, Kim MNW, Mark R, Kathy AB et al. Oral motor, communication, and nutritional status of children during intrathecal baclofen therapy: A descriptive pilot study. Arch Phys Med Rehabil. 2003;84:500-6.
14. Anderson MA. Critical Review: The Effects of Intrathecal Baclofen Therapy on Speech in Individuals with Cerebral Palsy. School of Communication Sciences and Disorders, U.W.O; 2007
15. Madhav S, Ted G, Hadas G, Jessica P, Jacob PN. Evaluating the use of baclofen as adjunct treatment for muscle tension dysphonia. Am J Otolaryngol. 2022;43(2):103309.