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Case Report

Navigating early speech and swallowing challenges in progressive supranuclear palsy: A case study

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ABSTRACT

Background: Progressive supranuclear palsy is a multisystem neurodegenerative disease which exhibits symptoms such as cognitive change, impaired balance, early falls, blurry or double vision, sleep difficulties, dysphagia, drooling, urinary urgency or incontinence, constipation, depression or anxiety, hyperphagia and change in food preferences, and weight loss.

Case Presentation: The present case discusses the speech and swallowing issues in a 61-year-old male with progressive supranuclear palsy at early stage. Speech and swallowing observations revealed aspiration, hypophonia, difficulty swallowing, regurgitation episodes, and slurred speech. Followed by speech and swallowing assessment, the patient was diagnosed with Dysarthria with oropharyngeal dysphagia. T Syndopa Plus (1mg 1-1-1/day) was recommended by a neurologist. Diet modification and safe swallow strategies were suggested by speech language pathologist. Follow up after one month showed a significant improvement in swallowing skills and speech intelligibility.

Conclusion: The patient with progressive supranuclear palsy responds well to the T Syndopa- Plus (1mg 1-1-1/day) medication, diet modification and safe swallow strategies at an early stage of the disorder. The present case stresses on the importance of swallow related intervention at early stage.

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1. Background

Progressive supranuclear palsy (PSP) is a multisystem neurodegenerative disease of unknown etiology. PSP is a rare neurological condition that results in severe and persistent issues with control of gait and balance.¹ The disorder is brought on by a progressive decline in the brain cells that regulate coordination and movement, as well as by exposure to an unidentified dietary ingredient and random genetic mutation. The symptoms of PSP are cognitive change, impaired balance, early falls, blurry or double vision, sleep difficulties, dysphagia, drooling, urinary urgency or incontinence, constipation, depression

or anxiety, hyperphagia and change in food preferences, and weight loss. Common sign of PSP include akinetic rigidity, slow saccades and verticle saccades, vertical supranuclear gaze palsy, frontalis overactivity, reduced blink, staring expression, uncontrolled decent into a chair, dystonia, apraxia, emotional lability, reduced verbal fluency and dysarthrophonia.² The gradual reduction of voluntary movements is one of the hallmarks of progressive supranuclear palsy. Dysarthria and dysphagia were the most prevalent speech and language traits connected to PSP.³ Josephs et al.⁴ have discussed a clinical variant of PSP, i.e. progressive supranuclear palsy (PSP) with predominant speech/ language disorder (PSP-SL), where individuals of this variant reported to have progressive apraxia of speech, or agrammatism. Most of

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these individuals present symptoms such as Bradykinesia, rigidity, postural instability, ocular motor impairment and ideomotor apraxia.^{5,6} However, there is very little knowledge about the dysphagia aspect in these individuals. The present case study discusses speech and swallowing problems in a patient at early stage of PSP, speech and swallowing assessment and rehabilitation.

2. Case Presentation

A 61-year-old man who had been experiencing balance issues, nasal regurgitation, and swallowing issues for 1.5 years brought his concerns to the hospital. The progression began gradually and was excessive. The neurological evaluation revealed abnormalities with speaking and swallowing, regurgitation episodes, bradykinesia, balance problems, saliva dribbling, hypophonia, hyponemia, and emotional vulnerability. The patient was given the diagnosis of Progressive Supranuclear Palsy P-type, and the neurologist recommended T Syndopa - plus (1mg 1-1-1/day). Following a neurological assessment, the patient was recommended for physiotherapy and a speech-language & swallowing evaluation. Bradykinesia and balance problems were found during the physiotherapy evaluation.

At the department of speech-language pathology, assessments of swallowing and speech were performed. The patient presented the complaint of nasal regurgitation, swallowing issues, and some speech slurring. The patient had a history of acidity for three months and pneumonia six months prior. After the detailed case history, the speech-motor evaluation, the Frenchay dysarthria assessment (FDA)⁷ and the Manipal manual of swallowing assessment (MMSA)⁸ were carried out. The purpose of the speech motor examination was to evaluate the structure, appearance and function of the oral structures, including the lips, tongue, jaw, velum, and teeth. The examination results revealed that the lateralization and elevation of tongue were affected. For lips, retraction, protrusion and alternative movements were affected. Table 1 provides an illustration of the test's outcomes for speech motor function.

Table 1: Results of speech motor examination

Oral structure	Appearance	Function
Lips	Normal	Retraction, protrusion- slow; Alternative movements- restricted
Tongue	Normal	Retraction, protrusion- normal Lateralization and elevation- restricted
Jaw	Normal	Normal
Velum	Normal	Normal
Teeth	Missing teeth	-

The FDA findings are shown in Figure 1. The FDA results revealed poor respiratory control both at rest and during speech. Reduced lip alternating movements, inadequate lip seal, and restricted lip spreading were noted. Palatal movements were fairly normal. The range of pitch and volume was diminished. There were limitations on tongue protrusion, elevation, lateral movements, and alternating movements. Speech intelligibility was marginally compromised. Hence, the diagnosis made was dysarthria. Further, MPD and s/z ratio was assessed for the patient. The maximum phonation duration was /a/= 8seconds, /i/ =9seconds, /o/ = 9seconds. The s/z ratio was 0.5 Both MPD and s/z ratio revealed poor respiratory control.

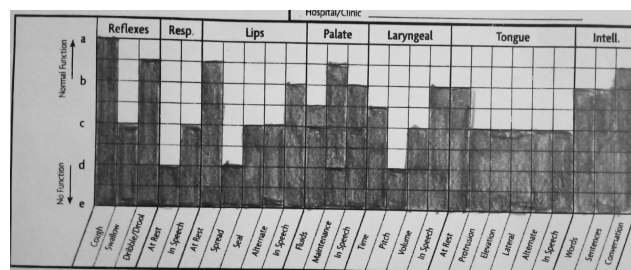


Figure 1: FDA results of the patient (initial assessment)

MMSA was used to evaluate swallowing, and Table 2 provides a summary of the findings. The results revealed that the oral and pharyngeal phases of swallowing were affected. Although the oral preparatory stage was normal, occasionally aspiration was present during swallowing. More difficulty was observed for liquids than solids. Hence, the results revealed the presence of oropharyngeal dysphagia.

Table 2: MMSA results of the patient

Subscales	Patient score	MMSA score for individuals with dysphagia ⁸	Mean	SD
Sensory assessment	0	2.5	1.91	
Motor assessment	38	34	8.76	
Dry swallow, thick liquid, thin liquid, solid	17	18	14.14	
Total score	55	52.50	31.8	

Therefore, oropharyngeal dysphagia with dysarthria secondary to Progressive Supranuclear Palsy was the diagnosis made at the speech-language pathology

department. The patient was given advice on diet modification, safe swallow strategies, and speech therapy. The patient was suggested to intake soft and mashed food, and to drink small sips of water frequently. Following safe swallow strategies were suggested to the patient: (i) Consume your food at a slow and attentive pace, giving your full attention to your meal, and avoid distractions like watching television or engaging in conversation during your eating time; (ii) Maintain an upright sitting posture when you dine, refraining from eating while reclining or lying down; (iii) Opt for a teaspoon when consuming solid foods. If you choose to use a straw, sip your drink one at a time, and if you're using a cup, take a small sip, tilting your chin downward before swallowing; (iv) Keep the food or beverage in your mouth and take a moment to consider swallowing before actually doing so; (v) Ensure that you've completely swallowed all the food in your mouth before taking another bite; and (vi) Don't rush through your meal; instead, savor it at a slow pace. In addition, oro-motor exercises to improve the strength and mobility of tongue and lip were demonstrated to the patient.

The individual was referred back to the neurology department, where they received instructions to take one tablet of T Syndopa plus (1mg) three times a day and were advised to come back for a follow-up appointment in a month. The patient came in for follow-up at the speech-language pathology department a month later. The patient's swallowing abilities significantly improved (Table 3), and there was no aspiration noted. Additionally, speaking clarity had increased as depicted in Figure 1. The FDA results at one month follow up indicted that there was a significant improvement across different domains of FDA.

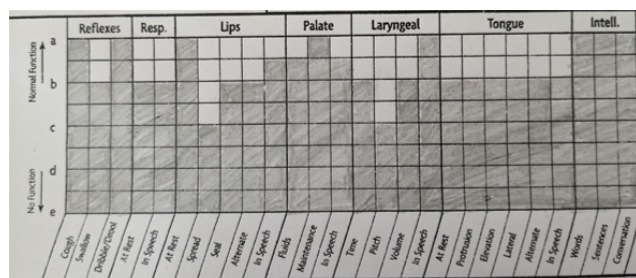


Figure 2: FDA results of the patient (at first follow-up)

The initial visit's interventions, which included dietary adjustments, safe swallowing techniques, oro-motor exercises, and medication, yielded a favorable outcome for the patient. The patient received advice from the speech-language pathology department to visit for follow-up appointments every six months and to contact the department right away if their speech intelligibility or swallowing difficulties worsen. The speech-language pathologist recommended that the patient schedule follow-up visits every six months and emphasized the importance

Table 3: MMSA results of the patient (at first follow-up)

Subscales		Patient score (at first follow-up)	Patient score (initial assessment)
Assessment of function	Sensory assessment	0	0
	Motor assessment	22	38
Assessment of phases of swallowing	Dry swallow, thick liquid, thin liquid, solid	09	17
Total score		32	55

of promptly reaching out if there is any deterioration in speech clarity or swallowing issues. Also, the patient was advised to continue the dietary adjustments, safe swallowing techniques, and oro-motor exercises.

3. Discussion

PSP, or Progressive Supranuclear Palsy, is a degenerative disease that impacts multiple systems, including the extrapyramidal system. It primarily affects the frontal cortex and its connections to the basal ganglia and brainstem.⁹ Individuals with PSP may experience deficits in both the oral and pharyngeal phases of swallowing. While extensive research has been conducted to understand various aspects of PSP, such as its neurological signs and symptoms, and medical treatments, there is a noticeable lack of literature focusing on the speech and swallowing challenges faced by individuals with PSP, particularly in the early stages of the disease. The objective of the current study is to provide insights into a case of early-stage PSP and how the associated speech and swallowing symptoms were effectively managed.

This case report focuses on a 61-year-old male in the early stages of PSP who experienced aspiration, hypophonia, and swallowing difficulties. After assessment, he was diagnosed with Dysarthria and oropharyngeal dysphagia. Treatment included T Syndopa Plus medication, diet modification, oro-motor exercises and safe swallowing strategies, resulting in significant improvement in speech and swallowing skills within a month. This suggests that early intervention with medication and therapeutic strategies can be effective in managing PSP-related symptoms. These results are supported by previous researchers who suggest that combining specific exercises with compensatory strategies can yield better prognosis in individuals with dysphagia.^{10,11}

4. Conclusion

This case report describes a patient with progressive supranuclear palsy exhibiting typical symptoms. Treatment

with T Syndopa Plus, along with dietary changes and safe swallowing techniques, led to significant improvement in speech and swallowing within a month, indicating the effectiveness of early intervention. The study highlights the significant impact of early intervention in neurodegenerative cases, particularly in improving the quality of life for patients with conditions like progressive supranuclear palsy. Early intervention encompasses both medical treatment, and rehabilitation strategies. To ensure the generalizability and reliability of these findings, further studies with larger sample sizes are necessary. A larger population-based study can provide more robust evidence regarding the effectiveness of early intervention strategies in improving the lives of individuals with neurodegenerative diseases. It can also help identify common patterns and variations in responses to treatment, ultimately leading to better guidelines for managing these conditions.

5. Source of Funding

No external funding was received for the research reported in the paper.

6. Competing Interests

We declare no conflict of interest in the paper titled “Navigating Early Speech and Swallowing Challenges in Progressive Supranuclear Palsy: A Case Study”.

A written consent from the participants was taken, where information regarding clinical procedure and approximate duration of the procedure was mentioned in the form. Permission was taken from the patient to publish the inform collected from the clinical procedure.

SM, NU, AB: ideation, formulation of the study design, data acquisition, inferring articles and drafting the manuscript; SS: ideation, inferring articles, and revision of manuscript.


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