



MULTIDISCIPLINARY ASSESSMENT AND VOICE THERAPY OUTCOMES IN A PROFESSIONAL VOICE USER WITH BILATERAL VOCAL FOLD NODULES: A DETAILED CASE STUDY

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ABSTRACT:

Bilateral vocal fold nodules are benign phono traumatic lesions frequently observed among professional voice users, particularly teachers. This case study presents a detailed clinical profile of a 31-year-old female teacher diagnosed with bilateral vocal fold nodules. A comprehensive pre-therapy and post-therapy assessment was conducted using perceptual, acoustic, aerodynamic, and patient-reported outcome measures. The intervention consisted of structured voice therapy, vocal hygiene education, psychological counseling, and otolaryngological supervision. Outcome analysis demonstrated significant improvement in voice quality, acoustic stability, vocal endurance, and functional communication. This report emphasizes the role of systematic assessment and objective analysis methods in documenting therapy outcomes and supports a multidisciplinary, non-surgical approach for managing vocal fold nodules.

KEYWORDS:

VOCAL FOLD NODULES, VOICE THERAPY, PROFESSIONAL VOICE USER, ACOUSTIC ANALYSIS, MULTIDISCIPLINARY MANAGEMENT.

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INTRODUCTION

Voice disorders constitute a significant occupational health concern, especially among professional voice users such as teachers, singers, and call-center workers. Teachers are particularly vulnerable due to prolonged voice use, high vocal load, background noise, and stress. Vocal fold nodules are among the most common benign lesions of the vocal folds and are typically bilateral and symmetric, resulting from chronic vocal misuse or overuse.

Current evidence supports behavioral voice therapy as the primary line of management for vocal fold nodules, with surgical intervention reserved for cases unresponsive to therapy. Accurate documentation of therapy outcomes requires systematic assessment using perceptual, acoustic, aerodynamic, and self-reported measures. This case study aims to present a **detailed analysis-based evaluation** of pre- and post-therapy outcomes in a professional voice user.

CASE HISTORY

A 31-year-old female teacher reported to the Speech and Language Pathology Department with the chief complaints of:

- Persistent hoarseness
- Vocal fatigue after prolonged teaching

- Reduced vocal loudness
- Throat discomfort and frequent throat clearing

The symptoms had been present for approximately **8 months** and progressively worsened during teaching hours. Temporary improvement was reported following voice rest. There was no history of smoking, alcohol consumption, neurological illness, or previous voice therapy. The patient reported high occupational stress and prolonged daily voice use (5–6 hours/day).

OTOLARYNGOLOGICAL (ENT) EVALUATION

Laryngeal examination using flexible laryngoscopy revealed:

- Bilateral, symmetric vocal fold nodules
- Lesions located at the junction of the anterior and middle one-third of the vocal folds
- Normal vocal fold mobility
- Incomplete glottal closure during phonation

Based on ENT findings, the patient was referred for detailed speech-language and voice evaluation.

SPEECH AND LANGUAGE EVALUATION

ASSESSMENT PROTOCOL

A multidimensional voice assessment protocol was followed, including:

1. Perceptual voice evaluation
2. Acoustic voice analysis
3. Aerodynamic assessment
4. Patient-reported outcome measures
5. Speech and language screening

PRE-THERAPY ASSESSMENT

1. PERCEPTUAL VOICE ANALYSIS

Perceptual evaluation was carried out by a qualified speech-language pathologist using the **GRBAS Scale**, which rates voice quality across five parameters: Grade, Roughness, Breathiness, Asthenia, and Strain.

PRE-THERAPY GRBAS SCORES

- Grade: Moderate
- Roughness: Moderate
- Breathiness: Mild
- Asthenia: Absent
- Strain: Moderate

2. ACOUSTIC VOICE ANALYSIS

Acoustic analysis was conducted using sustained vowel phonation (/a/) recorded in a quiet environment. The following parameters were analyzed:

- **Jitter (%)** – frequency perturbation
- **Shimmer (%)** – amplitude perturbation
- **Maximum Phonation Duration (MPD)**

PRE-THERAPY ACOUSTIC MEASURES

Parameter	Value
Jitter (%)	1.8
Shimmer (%)	4.5
MPD (seconds)	8

Elevated jitter and shimmer values indicated vocal instability, while reduced MPD suggested inefficient phonatory control.

3. AERODYNAMIC ASSESSMENT

Aerodynamic efficiency was assessed indirectly using:

- Maximum phonation duration
- Observed phonatory effort

Findings indicated reduced breath support and increased laryngeal tension during phonation.

4. VOICE HANDICAP INDEX (VHI)

The **Voice Handicap Index (VHI)** was administered to assess the patient's perceived impact of the voice disorder

across functional, physical, and emotional domains.

- Pre-therapy scores indicated **moderate to severe voice handicap**, particularly affecting occupational performance.

5. SPEECH AND LANGUAGE ASSESSMENT

- Receptive language: Within normal limits
- Expressive language: Within normal limits
- Articulation and resonance: Normal
- Voice quality negatively impacted speech intelligibility during prolonged speech tasks

DIAGNOSIS

Based on ENT findings and speech-language evaluation, the patient was diagnosed with:

Bilateral Vocal Fold Nodules secondary to chronic vocal misuse and occupational voice overuse

INTERVENTION

VOICE THERAPY PROGRAM

A structured voice therapy program was implemented for **6 weeks**, with **two sessions per week**.

THERAPEUTIC COMPONENTS INCLUDED:

- Vocal hygiene education
- Elimination of vocal abuse behaviors (shouting, throat clearing)
- Resonant voice therapy
- Easy onset phonation
- Diaphragmatic breathing exercises
- Laryngeal relaxation techniques
- Postural alignment training

PSYCHOLOGICAL INTERVENTION

Psychological counseling was recommended to address:

- Occupational stress
- Vocal performance anxiety
- Behavioral factors contributing to vocal misuse

ENT MANAGEMENT

Regular ENT follow-ups were conducted to monitor lesion status. Surgical intervention was not advised during the therapy period.

POST-THERAPY ASSESSMENT AND ANALYSIS METHODS

The **same assessment tools and procedures** used during pre-therapy evaluation were repeated post-therapy to ensure consistency and reliability of results.

ANALYSIS METHOD

- **Within-subject pre- vs post-therapy comparison**
- Perceptual scores compared descriptively

- Acoustic parameters compared using absolute value changes
- Functional improvement assessed using VHI score reduction

POST-THERAPY RESULTS

1. PERCEPTUAL VOICE EVALUATION (GRBAS)

Parameter	Pre-Therapy	Post-Therapy
Grade	Moderate	Mild
Roughness	Moderate	Mild
Breathiness	Mild	Absent
Strain	Moderate	Mild

2. ACOUSTIC VOICE ANALYSIS

Parameter	Pre-Therapy	Post-Therapy
Jitter (%)	1.8	0.6
Shimmer (%)	4.5	2.1
MPD (seconds)	8	14
Jitter (%)	1.8	0.6

ANALYSIS SHOWED:

- Reduction in frequency and amplitude perturbation
- Improved phonatory efficiency
- Increased vocal endurance

3. VOICE HANDICAP INDEX

- Post-therapy VHI scores showed **marked reduction**
- Improved functional, emotional, and occupational voice use

4. FUNCTIONAL OUTCOME

- Improved vocal stamina during teaching
- Reduced hoarseness and vocal fatigue
- Increased confidence in professional communication

DISCUSSION

The present case demonstrates that structured voice therapy, when guided by systematic assessment and objective analysis methods, can lead to significant vocal improvement in patients with bilateral vocal fold nodules. Acoustic improvements reflect enhanced vocal fold vibration stability, while perceptual improvements correlate with reduced phonotrauma. Psychological counseling contributed to behavioral modification and stress reduction, supporting long-term vocal health.

CONCLUSION

This case study highlights the effectiveness of a multidisciplinary, non-surgical approach in the management of bilateral vocal fold nodules. Objective pre- and post-therapy analysis methods are essential for documenting treatment outcomes and guiding clinical decision-making.

CLINICAL IMPLICATIONS

- Voice therapy should be the primary treatment for vocal fold nodules
- Multidimensional assessment ensures reliable outcome documentation
- Psychological and ENT collaboration enhances treatment success

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