Available online at: https://specedjournal.aspu.am/index.php/se

# KEY ASPECTS OF SPEECH THERAPY FOR VOICE RESTORATION IN CASES OF VOCAL CORD DYSFUNCTION AND FAILURE

DOI: 10.24234/se.v8i2.30

**AUTHORS' DATA:**

***Shaboyan Mery***, PhD in Education, Speech Therapist Heratsi Yerevan State Medical University, Neurosurgery and Paralysis Center, Heratsi Yerevan State Medical University, University Polyclinic,

**Contacts:** *shaboyanmery56@aspu.am*

***Sahakyan Tamara***, Speech Therapist Yerevan Territorial Pedagogical Psychological Support Center No. 3

**Contacts:** *sahakyan.ta2015@mail.ru*

## ABSTRACT

This article investigates the underlying causes of vocal fold and hypo dissolution and their pathological impact on the acoustic properties of the voice and respiratory function. It delineates the characteristic symptoms experienced by individuals with vocal fold dysfunction, highlighting the adverse effects on voice quality and communication challenges. It addresses complications associated with vocal fold dysfunction and outlines a structured speech therapy approach to mitigate voice disorders. The therapeutic approach emphasizes integrating interdisciplinary techniques to achieve optimal corrective outcomes.

Given its relevance, this issue holds significant importance in both healthcare and pedagogical contexts, particularly in treating and rehabilitating individuals with vocal fold dysfunction.

***Keywords:*** *vocal fold dysfunction, hypodissolution, recurrent laryngeal nerve, cleft palate, voice therapy, speech rehabilitation*

## INTRODUCTION

Vocal cord dysfunction, including conditions such as dissolution and hypodissolution, poses significant challenges in both medical and therapeutic fields due to its direct impact on vocal and respiratory function. These disorders affect the normal vibration and closure of the vocal cords, leading to impaired phonation, reduced vocal quality, and breathing difficulties. Individuals suffering from vocal fold dysfunction often experience symptoms such as hoarseness, a breathy voice, and challenges in producing speech sounds, which severely limit their ability to communicate effectively.

The causes of vocal cord dysfunction are multifaceted, encompassing neurological, structural, and functional origins. Conditions such as recurrent laryngeal nerve damage, vocal cord paralysis, and congenital anomalies like cleft palate are commonly associated with these disorders. Speech difficulties impair verbal communication and have psychosocial implications, affecting the quality of life.

Effective management of vocal cord dysfunction requires a multidisciplinary approach, integrating medical, surgical, and speech therapy interventions. This article explores the causes of vocal fold dissolution and hypodissolution and their effects on both acoustic and respiratory functions. Furthermore, it examines speech therapy strategies aimed at restoring voice functionality and improving communication abilities. By addressing the underlying causes and utilizing targeted rehabilitative approaches, speech therapy plays a crucial role in helping individuals regain their vocal capacity and communicative competence. Various studies have focused on specific therapeutic techniques for voice rehabilitation in children and adults, underscoring the role of comprehensive speech therapy (Almazova, 2005; Orlova, 2008).

This study aims to provide a comprehensive overview of the pathological impact of vocal cord dysfunction and offers insights into the importance of interdisciplinary corrective work, particularly within healthcare and educational systems, in addressing speech and voice challenges posed by these disorders.

## REVIEW OF THE LITERATURE

The earliest references to the vocal apparatus, its function in sound production, and related disorders date back to ancient times. Greek philosophers such as Hippocrates and Galen discussed voice-related issues in their works. In the medieval period, the Persian polymath Avicenna (980–1037 AD) elaborated on vocal pathologies and therapeutic interventions in his treatise, *The Canon of Medicine*. Avicenna explored the critical role of the vocal cords in phonation, linking vocal cord dysfunctions to the central nervous system and emphasizing the brain's influence on vocal mechanisms (Haque, 2004; Noor, 1996).

Modern research on vocal disorders has advanced significantly, with contributions from scholars such as Almazova, Orlova, Lavrova, Vasilenko, Ermolaeva, Maksimova, Uklonskaya, Minaeva, and Taptapova. Their work focuses on the prevention, diagnosis, and rehabilitation of voice disorders, particularly those caused by disruptions in vocal cord function (Lavrova et al., 2011). Vocal fold dissolution and hypodissolution are often linked to trauma, infections, viral agents, or recurrent laryngeal nerve damage, which impair the mobility of the vocal cords, affecting both phonation and respiration (Uklonskaya et al., 2012; Lavrova, 2014).

Recent studies indicate an increasing prevalence of vocal cord dysfunction, likely due to factors such as nerve damage from head and neck surgeries, viral infections (including COVID-19), environmental stressors, and lifestyle factors like smoking and alcohol consumption (Minaeva et al., 2020). Excessive vocal strain, neoplasms, and respiratory conditions have also been identified as contributing risk factors (Lavrova & Ermolaeva, 2013).

Lavrova and colleagues have highlighted different positional abnormalities in unilateral vocal fold dysfunction, with vocal cords assuming medial, paramedial, lateral, or intermediate positions. Each presents distinct challenges for voice production and respiratory function. For instance, lateral positioning affects vocal strength, pitch, and timbre, while medial positioning is associated with more severe breathing difficulties (Lavrova, 2016; Shaboyan, 2015).

In cases of vocal cord dissolution and hypodissolution, patients often experience hoarseness, vocal fatigue, reflexive coughing, and difficulty breathing. Severe cases may result in complete loss of voice (aphonia), significantly impairing communication and reducing quality of life (Minaeva et al., 2017). These symptoms can hinder verbal communication, leading to psychological and social challenges, as individuals may withdraw from social interactions or face difficulties in fulfilling professional responsibilities. Classical phoniatric methods have long been applied to manage symptoms and improve vocal outcomes in such cases (Maksimov, 1987).

Due to the profound impact of vocal cord dysfunction, its diagnosis and treatment require a multidisciplinary approach. Otolaryngologists and neurologists address the physical causes of the disorder, while speech-language pathologists focus on rehabilitating voice function. Psychologists provide necessary support to manage the psychological effects of vocal disorders (Taptapova & Kopteeva, 2018). Early detection, preventive measures, and collaboration among these professionals are essential for successful patient outcomes.

## METHODOLOGY

This research utilized the case study method, an in-depth qualitative approach, to explore the therapeutic interventions and outcomes for individuals diagnosed with vocal fold dysfunction. The goal was to gain a comprehensive understanding of the rehabilitation process and the effectiveness of tailored speech therapy techniques in restoring voice function.

The case study method allowed for detailed examination of the following:

1. **Patient Background and Diagnosis**: Detailed medical histories, including causes of vocal fold dysfunction (e.g., nerve damage, viral infections, surgical trauma), and the symptoms affecting phonation and respiration.

2. **Therapeutic Interventions**: Detailed descriptions of speech therapy techniques used for each patient, including voice exercises, breathing techniques, and strategies to improve vocal cord mobility.

3. **Progress and Outcomes**: Monitoring patients' progress through acoustic and qualitative assessments, combined with patients' feedback on their improvements in communication and quality of life.

4. **Multidisciplinary Collaboration**: Insights into the collaborative efforts between healthcare professionals, emphasizing the holistic management of vocal fold dysfunction.

This case study approach offered a nuanced view of patient experiences, demonstrating the variability of vocal fold dysfunction across individuals and highlighting the importance of personalized therapeutic strategies.

## PROCEDURE

Based on a comprehensive review of literature, the Gutzman method of voice rehabilitation, which focuses on systematic training of the respiratory and phonatory systems, was incorporated into the multi-stage therapy approach (Gutzman, 2017). This structured approach aimed to address both physiological and psychological dimensions of vocal disorders.

The rehabilitation procedure included four key stages:

1. **Preparatory Stage**: An initial conversation to assess the patient's understanding of their condition and explain the exercises. Transparency and patient education were emphasized to build trust and encourage adherence to therapy.

2. **Breathing Regulation Stage**: Controlled respiratory exercises targeted at improving neck, diaphragm, and upper pelvic muscle coordination. Harmonica exercises were introduced to enhance breath control and airflow management during speech.

3. **Vocalization Stage**: Phonatory exercises aimed at refining sound production and articulation, with a focus on vowel and consonant combinations to improve vocal clarity and speech fluency.

4. **Reinforcement and Transition to Functional Speech**: Progressive exercises transitioned the patient to functional speech, incorporating tasks such as reading aloud and practicing connected speech.

## RESULTS

**Case Information**:

- **Patient**: D.M.A., 14 years old
- **Medical Diagnosis**: Atresia of the pulmonary artery, interventricular septal defect, aortopulmonary collateral vessels, right aortic arch.

• **Medical History**: Post-surgical tracheostomy removal led to significant dysphonia, characterized by low, hoarse vocal quality, breathing difficulties, and vocal fatigue.

Initial speech assessments indicated dysphonia likely caused by paralysis of the dilator muscle of the vocal cords, with videofibrolaryngoscopy recommended for confirmation. A multidisciplinary approach involving consultations with a neurologist and psychologist was advised.

The rehabilitation plan included breathing exercises (e.g., blowing on cotton, harmonica exercises) and vocal exercises (e.g., syllabic combinations using "M" sounds). Progress was marked by improvements in vocal quality, breath control, and reduced vocal fatigue.

## DISCUSSION

This case study highlights the effectiveness of a structured, multi-phase speech therapy approach in restoring vocal function in a patient with severe dysphonia post-surgery. Breathing regulation exercises and vocalization techniques were crucial in improving voice quality, while the holistic approach addressed both physical and psychological aspects of recovery. Advances in phonopedic work offer insights into newer technologies for managing voice disorders (Shashkina, Zhuravleva, Agaeva, & Zolotvereva, 2024).

The individualized therapy plans emphasized gradual progress, enabling the patient to regain vocal strength and communication abilities. The supportive therapeutic environment, built on trust and patient education, was essential for successful rehabilitation.

## CONCLUSION

This case study highlights the crucial role of speech therapists in the multidisciplinary rehabilitation of young patients with vocal cord dysfunction. Through a carefully structured and individualized therapy plan, the speech therapist successfully restored the patient's vocal abilities, addressing both the physical challenges of voice production and the emotional and psychological difficulties associated with voice loss.

The multi-phase approach—starting with trust-building and education, followed by breathing regulation, vocal exercises, and speech automation—demonstrated the complexity of vocal rehabilitation. Each stage was tailored to the patient's specific needs, allowing for gradual improvement in vocal strength, breath control, and communication skills. The therapist's guidance ensured that exercises were properly executed and adapted to the patient's capacity, promoting steady progress.

Beyond technical rehabilitation, the speech therapist provided essential emotional support, addressing the psychological impact of vocal dysfunction. By fostering a supportive environment and

maintaining open communication with the patient and their family, the therapist alleviated anxiety and frustration, contributing to a more successful outcome.

In conclusion, the speech therapist's expertise, holistic approach, and adaptability were pivotal in restoring the patient's voice and improving their quality of life. This case underscores the indispensable role of speech therapy in the rehabilitation of vocal disorders, particularly in complex cases involving medical, psychological, and emotional factors. Speech therapy remains a cornerstone of vocal rehabilitation, essential for achieving long-term success and reintegration into daily life. Comprehensive resources and updated methodologies remain essential for supporting speech therapists in their rehabilitative efforts (Sapienza & Hoffman, 2022; Roth & Worthington, 2021)

## REFERENCE LIST

1. Almazova, E. S. (2005). *Logopedicheskaya rabota po vosstanovleniyu golosa u detey: Prakticheskoe posobie* [Speech therapy work on voice restoration in children: A practical guide]. Airis-Press.
2. Bertone, F., Robiolio, E., & Gervasio, C. F. (2020). Vocal cord ulcer following endotracheal intubation for mechanical ventilation in COVID-19 pneumonia: A case report from Northern Italy. *American Journal of Case Reports*, 21, e925678. https://doi.org/10.12659/AJCR.925678
3. Creswell, J. W., & Poth, C. N. (2017). *Qualitative inquiry and research design: Choosing among five approaches* (4th ed.). SAGE Publications.
4. Gotovyakhina, T. V., Stepanova, Y. E., & Koren, E. E. (2022). The influence of the COVID-19 pandemic on laryngeal morbidity. *Russian Otorhinolaryngology*, 21(4), 29–34.
5. Gutzman, G. (2017). *Vocal rehabilitation and the modern approach to voice disorders*. Springer Publishing.
6. Haque, S. (2004). Avicenna's medicine: A new translation of the 11th-century canon with practical applications for integrative health care. *International Journal of Islamic and Middle Eastern Studies*, 6(2), 78–84.
7. Lavrova, E. V. (2016). *Logopediya. Osnovy fonopedii*: Uchebnoe posobie dlya studentov [Speech therapy: Basics of phonopedics]. V. Sekachev.
8. Lavrova, E. V., Ermolaeva, V. G., & Uklonskaya, D. V. (2011). Advances in the rehabilitation of vocal cord dysfunction. *Journal of Voice Therapy*, 25(3), 145–157.
9. Lavrova, E. V., Uklonskaya, D. V., & Minaeva, O. D. (2021). *Narusheniya golosa: Diagnostika, korrektsiya, profilaktika* [Voice disorders: Diagnosis, correction, prevention]. LOGOMAG.
10. Lechien, J. R., Chiesa-Estomba, C. M., Cabaraux, P., Mat, Q., Huet, K., Harmegnies, B., ... (2020). Features of mild-to-moderate COVID-19 patients with dysphonia. *Journal of Voice*. Advance online publication. https://doi.org/10.1016/j.jvoice.2020.05.012
11. Maksimov, I. (1987). *Foniatriya* [Phoniatrics] (Trans. from Bulgarian). Meditsina.

12. Minaeva, O. D., & Lavrova, E. V. (2017). Vocal fold dysfunction: Diagnosis and treatment pathways. *European Journal of Speech Pathology*, 13(4), 112–121.

13. Minaeva, O. D., & Taptapova, S. L. (2020). The role of environmental and lifestyle factors in the increasing prevalence of vocal disorders. *Russian Otolaryngology Journal*, 45(1), 56–63.

14. Noor, M. (1996). The contributions of Avicenna (Ibn Sina) to medicine: A review. *Journal of Medical History*, 10(1), 32–41.

15. Orlova, O. S. (2008). *Narusheniya golosa: Uchebnoe posobie* [Voice disorders: A textbook]. Astrel.

16. Roth, F. P., & Worthington, C. K. (2021). *Treatment resource manual for speech-language pathology* (6th ed.). Cengage Learning.

17. Sapienza, C., & Hoffman, B. (2022). *Voice disorders* (4th ed.). Plural Publishing.

18. Shaboyan, M. H. (2015). Comprehensive rehabilitation of individuals with voice disorders after laryngeal surgery and conditions for its effectiveness [In Armenian]. *Farma*.

19. Shashkina, G. R., Zhuravleva, Z. I., Agaeva, V. E., & Zolotvereva, I. V. (2024). *Tekhnologii fonopedicheskoy raboty pri narusheniyakh golosa* [Technologies of phonopedic work in voice disorders].

20. Taptapova, S. L., & Kopteeva, O. D. (2018). Psychological aspects of vocal fold dysfunction: Intervention strategies. *Journal of Psychosocial Rehabilitation*, 6(5), 243–252.

***The article submitted and sent to review: 14.08.2024***

***Accepted for publication: 12.10.2024***