



## Unilateral Vocal Cord Paralysis Following Total Thyroidectomy: A Case Report

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### Abstract

Unilateral Vocal Cord Paralysis (UVCP) is a serious complication often associated with thyroid surgery, characterized by a range of symptoms from mild dysphonia to significant airway obstruction. This case report describes a 45-year-old female patient who developed UVCP following a total thyroidectomy for a symptomatic multinodular goiter. We provide a comprehensive overview of her clinical presentation, the diagnostic process, management strategies employed, and the final outcomes. This case underscores the importance of early diagnosis and intervention in minimizing complications and improving quality of life for affected patients.

**Keywords:** Unilateral vocal cord paralysis; Thyroid surgery; Recurrent laryngeal nerve; Dysphonia; Airway obstruction; Voice therapy; Surgical complications; Nerve injury prevention; Quality of life; Management strategies

### Introduction

Unilateral vocal cord paralysis results from dysfunction of the Recurrent Laryngeal Nerve (RLN), a crucial nerve responsible for the motor function of the vocal cords. Injury to this nerve during thyroid surgery is one of the most common complications, potentially leading to severe dysphonia, respiratory difficulties, and decreased quality of life [1-3]. This condition can arise due to several factors, including surgical technique, anatomical variations, and pre-existing medical conditions. The incidence of UVCP following thyroid surgery ranges from 1% to 5%, with higher rates reported in cases involving reoperation or significant surgical manipulation. The clinical implications of UVCP are profound, affecting not only the patient's voice but also their ability to communicate effectively and breathe comfortably. Thus, understanding the etiology, risk factors, and management of UVCP is vital for otolaryngologists and surgeons performing thyroid surgeries. This report aims to provide an in-depth analysis of a recent case of UVCP, detailing the clinical journey of the patient, highlighting the diagnostic challenges, management approaches, and the impact of this condition on the patient's quality of life [4,5].

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### Case Presentation

#### Patient profile

A 45-year-old female presented to our endocrine surgery clinic with complaints of a progressively enlarging goiter over the past year. She reported difficulty swallowing and intermittent discomfort in her neck, which prompted her to seek medical attention. The patient had no significant past medical history, and her family history was unremarkable for thyroid disease or voice disorders [6].

#### Preoperative assessment

A comprehensive preoperative evaluation was performed, including:

- Neck Ultrasound: Revealed a multinodular goiter with no signs of malignancy. The largest nodule measured approximately 3.5 cm.
- Fine-Needle Aspiration Biopsy (FNAB): Indicated benign thyroid tissue, ruling out the presence of cancer.
- Flexible Laryngoscopy: Conducted to assess baseline vocal cord function, which revealed normal mobility of both vocal cords.
- Surgical History: The patient underwent a total thyroidectomy under general anesthesia. The procedure was performed by a highly experienced endocrine surgeon with a focus on nerve

preservation. Intraoperatively, careful attention was given to the identification and preservation of the RLN, utilizing nerve monitoring techniques to minimize the risk of injury. The surgery proceeded without complications, and the patient was discharged on the second postoperative day [7].

### Postoperative symptoms

At her first follow-up appointment one-week post-surgery, the patient reported significant changes in her voice, describing it as weak, breathy, and difficult to project. She experienced shortness of breath, particularly when lying supine, which raised concerns about her airway status. These symptoms prompted further evaluation to determine the cause of her vocal cord dysfunction [8].

### Clinical examination

During the clinical examination, the patient exhibited marked dysphonia characterized by a strained voice quality. Stridor was noted during physical exertion and when attempting to speak loudly. A laryngoscopic examination was performed, revealing left-sided vocal cord paralysis with the left vocal cord in a paramedian position, indicating significant loss of muscle tone and movement.

### Diagnostic imaging

To further investigate the cause of the vocal cord paralysis, a computed tomography (CT) scan of the neck was ordered. The imaging study showed no evidence of hematoma formation or any structural abnormalities that could compress the airway or affect the RLN. The absence of anatomical causes confirmed the diagnosis of UVCP secondary to surgical trauma during thyroidectomy.

## Discussion

Unilateral vocal cord paralysis following thyroid surgery poses a unique set of challenges for both the patient and the healthcare team. The risk factors for UVCP include:

- **Surgical technique:** Intraoperative factors, such as nerve manipulation or direct trauma during dissection, can lead to nerve injury.
- **Anatomical variations:** Anatomical differences in nerve pathways can predispose certain patients to injury.
- **Patient factors:** Prior neck surgeries, radiation history, and thyroid disease can increase the risk of complications.
- **Clinical implications:** Patients with UVCP may experience a range of symptoms that impact their daily lives, including:
  - **Hoarseness and dysphonia:** Difficulty producing sound can affect communication and social interactions.
  - **Respiratory compromise:** Impaired airway protection can lead to aspiration and respiratory distress, particularly during exertion or when supine.
  - **Psychosocial effects:** The psychological impact of voice changes and potential airway issues can lead to anxiety and depression.
  - **Management strategies:** Management of UVCP is typically multidisciplinary and must be tailored to the individual patient's needs. Initial management includes:
    - **Voice therapy:** Referral to a speech-language pathologist is essential for patients experiencing dysphonia. Voice therapy focuses on techniques to optimize voice production, reduce strain on the vocal cords, and enhance communication effectiveness. Exercises

may include breath support training and vocal cord strengthening techniques.

- **Observation:** In cases where symptoms are mild and the patient's airway is stable, a watchful waiting approach may be appropriate. Spontaneous recovery can occur in some patients, particularly within the first six months post-surgery.

For patients with persistent symptoms or significant airway compromise, surgical options may be considered:

- **Vocal cord medialization:** Procedures such as injection laryngoplasty, where materials like hyaluronic acid or autologous fat are injected into the affected vocal cord, can improve its position and restore function.
- **Laryngeal reinnervation:** More complex surgical techniques aim to restore nerve function to the vocal cords, though these are generally reserved for specific cases where other interventions have failed.
- **Postoperative follow-up:** Regular follow-up is essential to monitor the patient's recovery. In this case, the patient was scheduled for monthly follow-ups to assess her voice quality and airway status. During these visits, she underwent repeat laryngoscopic evaluations to document any changes in vocal cord mobility and assess the effectiveness of voice therapy [9,10].

## Conclusion

This case report illustrates the complexities and challenges associated with unilateral vocal cord paralysis following thyroid surgery. It emphasizes the critical need for thorough preoperative assessment, meticulous surgical technique, and vigilant postoperative monitoring to minimize the risk of complications. Early identification and intervention strategies are vital to improve patient outcomes and restore vocal function. Furthermore, this case highlights the necessity for ongoing research into surgical techniques and nerve preservation strategies, which may further reduce the incidence of this debilitating condition. Collaborative efforts among surgeons, speech therapists, and other healthcare providers are crucial to optimize management and enhance the quality of life for patients affected by UVCP.

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