



# Delayed respiratory distress after thyroidectomy – another challenge for us: a case report

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**Background:** Delayed airway obstruction and the resulting severe dyspnea with acute distress are rare but life-threatening postoperative thyroidectomy complications. Unfortunately, if not adequately attended to on time, they could cost a patient's life.

**Case Description:** A 47-year-old female patient who underwent thyroidectomy was left at the end of surgery with a tracheostomy, because of tracheomalacia and recurrent laryngeal nerve injury. Within the next ten days, her health condition gradually worsened. She complained of unexpected symptoms of shortness of breath, airway compromise and neck inflammation even with the existing tracheostomy tube. In face of new onset dyspnea, without giving proper attention to the postoperative course of this complicated patient, the consulting otorhinolaryngologist decided to decannulate the patient on the sixth postoperative day. This precipitated the presentation of an extensive neck infection with resultant total bilateral vocal fold immobility, followed by life-threatening airway obstruction, due to an unintentionally forgotten gauze in peritracheal space during thyroidectomy. In critical condition, the patient was successfully intubated with Rapid Sequence Induction, which enabled ventilation, oxygenation and saved the patient's life. After definitively securing the airway, she underwent tracheostomy with tracheal re-cannulation. After a prolonged antimicrobial course and achieving voice rehabilitation, the patient was decannulated.

**Conclusions:** Post thyroidectomy dyspnea is possible even with tracheostomy in place. The decision-making in the management of a thyroidectomy patient is of paramount importance not only intraoperatively, but also in the postoperative period and the gland surgeon expertise is of supreme value for avoiding life-threatening complications. In case of postoperative complaints, the patient should be referred first to the gland surgeon and only thereafter to other medical consultants. Disregarding a variety of factors like patient characteristics, risk factors and comorbidity, available diagnostic tools and specific recovery profile could cost the patient's life.

**Keywords:** Respiratory distress; thyroidectomy complications; tracheostomy; asphyxiation; case report

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## Introduction

Early airway obstruction with acute respiratory distress is a rare but life-threatening complication after total thyroidectomy (TT) (1-3). It could be a potential result of some well-known postoperative complications: recurrent laryngeal nerve (RLN) injury, especially bilateral, with vocal cord paralysis (VCP) and tracheomalacia. Usually, they are seen after the operation and tracheal extubation and are expected from the surgical team. The immediate patient's management consists of reintubation with or without tracheostomy, followed by definitive treatment (4,5). In comparison, delayed airway obstruction, presenting even days after TT is due to unexpected events, like tracheal compression because of postoperative neck oedema, inflammation or hemorrhage (6-9). These delayed postoperative pitfalls, though infrequent, are possible and unexpected, which represent a critical emergency (10,11). Even Emergency Departments (ED) staff and some senior clinicians are not familiar with the proper case management in face of severe glottic closure and patient asphyxiation (5,10). Moreover, the wrong decision-making could have costed the patient's life. By presenting this case, we attempt to raise awareness about predicting, diagnosing and managing of asphyxiating patient, also to point a critical importance of gland surgeon expertise for proper decision-making when medically approaching thyroidectomy

patient population. We present this case in accordance with the CARE reporting checklist (available at <https://gs.amegroups.com/article/view/10.21037/gS-22-534/rc>).

## Case description

### Chief complaints

A 47-year-old obese and short neck woman [body mass index (BMI): 42 kg/m<sup>2</sup>] was admitted in an ED with dramatic respiratory distress and asphyxiation on the twenty-sixth postoperative day after TT.

### History of present illness

Underwent TT after a fine-needle biopsy confirmed medullary thyroid carcinoma in enlarged fibrotic multinodular massive goiter causing tracheal compression. Preoperatively, the patient complained of gradual neck stiffness, throat fullness, hoarseness, some degree of orthopnea and having difficulty breathing. At the end of operation, the patient was transferred to post anesthesia care unit with a tracheostomy tube in place, given the extensive and difficult neck dissection with presumed RLN injury and intraoperatively seen tracheomalacia. The rest of the postoperative period was unremarkable and she was discharged from the hospital on the second postoperative day.

Within the next six days, the patient gradually experienced unexpected neck stiffness, throat tightness and dyspnea. Additionally, she reported pain during swallowing and subfebrile condition alongside cough and purulent sputum. Given the existing tracheostomy and the suspected problem with the tracheostomy tube [partial occlusion or an aggravation in long-standing patient's chronic obstructive pulmonary disease (COPD)], the patient was referred to an otorhinolaryngologist. After an indirect mirror laryngoscopy was performed, a right VCP was noted and the neck was described as visibly swollen possessing a reddish color. In face of new onset dyspnea, without giving proper attention to the postoperative course of this complicated patient, or the possibility of arising surgical complications, the consulting otorhinolaryngologist decided to decannulate and discharge the patient. A few days thereafter, with continued worsening of all complaints especially breathing difficulties, the patient was referred to the pulmonologist, who rose the bronchodilators dosages but without any clinical improvement.

## Highlight box

### Key findings

- Delayed respiratory distress after total thyroidectomy is rare, but possible, even in patients with preventive tracheostomy in place.

### What is known and what is new?

- The decision-making in the management of a thyroidectomy patient is of paramount importance not only intraoperatively, but also in the postoperative period and the gland surgeon expertise is of primary importance for avoiding life-threatening complications.
- Even in cases with closed glottis and asphyxiation, conventional airway management like Rapid Sequence Induction and endotracheal intubation are safe and should be undertaken immediately in attempt to save the patient's life.

### What is the implication, and what should change now?

- In patients with closed glottis and asphyxiation, tracheostomy could be performed only after securing the airways and enabling ventilation and oxygenation.

### Personal and family history

The patient was diagnosed with hypertension and COPD approximately 10 years ago and has been regularly using Indapamide, Candesartan, Albuterol and Tiotropium bromide.

### Physical examination

At the ED, the patient was in critical condition, the breathing was possible only in a tripod position with severe tachydyspnea (respiratory rate 48/min), desaturation (SpO<sub>2</sub> 68% at room air) with intense cyanosis, orthodeoxia, orthopnea and prominent biphasic stridor with significantly increased work of breathing, diaphoresis, practically impossible swallowing, tachycardia (144 beats/min), hypertension (186/110 mmHg) and nearly aphonia. Her temperature was 38.9 °C. Upon neck examination, a post thyroidectomy scar was reddish and the previous tracheostomy was fully



**Figure 1** Axial computed tomography scan of the neck: a large pre-tracheal cavity (30 mm × 21 mm × 24 mm) with gaseous content, located in front of the proximal trachea.

obliterated. Also, a large painful submandibular mass with bilateral expiratory rhonchi, purulent sputum and reddish discoloration of the skin were noted.

### Laboratory examinations

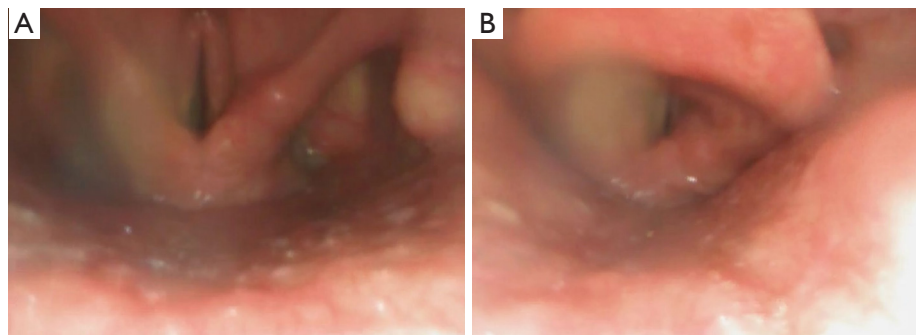
There was no time for laboratory examinations.

### Imaging examinations

Contrast enhanced CT scan of the neck performed in extreme promptitude revealed a large pre-tracheal cavity (30 mm × 21 mm × 24 mm) with spongiform appearance and gaseous content in front of the proximal trachea (*Figure 1*). A closed glottis with immobile glottic musculature and bilateral VCP (*Figure 2*) were seen on flexible video-laryngoscopy.

### Final diagnosis and treatment

Expecting a “cannot intubate, cannot ventilate” scenario, after 10 min. pre-oxygenation with 100% O<sub>2</sub> in a sitting position with full-face, press-fit mask, resulting in SpO<sub>2</sub> raising up to 78%, the patient was intubated with a rapid sequence induction (200 µg fentanyl, 300 mg propofol, 100 mg succinylcholine). The direct laryngoscopy revealed Cormack Lehane 2<sup>nd</sup> grade with fully closed vocal cords, forming only a very small cleft posteriorly. After insertion of a laryngeal endotracheal tube 5.5 ID, which enabled uneventful ventilation, a re-tracheostomy was performed. After opening the pre-tracheal fascia, a stenosis of decay and an unintentionally retained gauze (a gossypiboma) were noted (*Figure 3*). Abscess cavity cultures revealed *Streptococcus viridans* >10<sup>5</sup>. Acute respiratory distress syndrome (ARDS), triggered by sepsis in this particular



**Figure 2** Position of vocal cords seen on flexible video-laryngoscopy: (A) inspiration; (B) expiration.



**Figure 3** Unintentionally retained gauze (a gossypiboma).



**Figure 4** Axial computed tomography scan of the lungs that does not exhibit specific data for acute respiratory distress syndrome.

patient was ruled out by typical clinical picture of a suffocation and a relatively preserved from infection lung parenchyma (*Figure 4*), seen on the initial plan of CT scan. Following an extensive antimicrobial course, the patient was cured and discharged.

The patient was successfully decannulated after a month, having made a full recovery from the neck inflammation and achieved gradual voice rehabilitation. Four months later, she still complained of some degree of voice fatigue.

#### **Ethical statement**

All procedures performed in this study were in accordance

with the ethical standards of the institutional and/or national research committee(s) and with the Helsinki Declaration (as revised in 2013). Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is provided for review by the editorial office of this journal. The study was approved by the Clinical Research Ethics Committee of the University Hospital “Queen Giovanna – ISUL” at the meeting on 31.08.2022 (No. CREC 2022/166).

#### **Discussion**

Airway obstruction is the most life-threatening symptom in patients after thyroid surgery. It may result from an RLN injury causing vocal cord immobility, tracheomalacia and compressive oedema or postoperative neck hemorrhage (1,2). It is customary to expect such complications especially if thyroid malignancy, massive goiter, distorted anatomical structures or postoperative inflammation are present (3,12-18). Given the relative scarcity of endocrine surgeons, the bulk of endocrine operations and the postoperative follow-up are performed by medical specialists (general surgeons, otorhinolaryngologists) without interest or prior experience in the field. All the aforementioned issues make TT a tricky operation that remains a source of concern for both patients and medical staff (14,15,18). Obesity, underlying medullary thyroid carcinoma in enlarged fibrotic multinodular goiter and an anatomically short neck, necessitating neck over-extension during surgical dissection, make our patient extremely prone to postoperative airway obstruction (3,13,17). Also, intraoperatively observed tracheomalacia and presumed RLN injury warranted elective tracheostomy. It was performed by the endocrine surgeon, thus initially avoiding post TT airway obstruction and early postoperative respiratory distress. In cases without tracheostomy, this respiratory distress is characteristically seen usually shortly after extubation, which makes this complication predictable, detectable and preventable (8,9). After the initial postoperative improvement, the patient returned in a few days to the ED, because of reappearance of neck stiffness, dyspnea, voice tiredness, subfebrile condition and difficult swallowing. Given the existing tracheostomy, these new complaints are unexpected and alarming. They need attention and clinical clarification. Comorbidity of hypertension and especially COPD or low clinical experience with TT patients could be the reasons why the consulting otorhinolaryngologist neglected the

case, even after the right VCP seen by mirror laryngoscopy. As a result of this medical error, the patient was unadvisedly decannulated and discharged home. Thus, the unaddressed and unrecognized neck infection was an issue, which in the next days led to total bilateral vocal cords immobility and delayed life-threatening respiratory distress. Presumably, it will be not the case, if the patient was referred firstly to the gland surgeon. In face of severe tachy-dyspnea, orthodeoxia, desaturation and prominent biphasic stridor, saving the patient's life required urgent medico-surgical action, because of total physical exhaustion and imminent death (5,6). Although relatively short, all surgical procedures for establishment of airways under local anesthesia (even emergent tracheotomy) (19), necessitate a quiet and immobile patient, remaining in a supine position. Given the existing insertion site infection they also necessitate time for precision! Immobility was completely impossible for our asphyxiating patient; even a gentle pressure on neck structures during tracheostomy under local anesthesia would be unsustainable. The flexible video laryngoscopy, gave a frustrating clinical picture of a glottic closure for any medical doctor but crucially, not the underlying reason for the patient's critical condition. The CT scan revealing a spongy cavity with gaseous content was also unreliable. Hence, the most crucial decision concerning the patient's life, was to establish definitive airways first, and only thereafter proceeding with tracheostomy. It was undertaken at the ED from a consultant in Anesthesiology and Intensive Care. Unfortunately, there have been cases of fatalities in a similar scenario at a local hospital ED, where concerning "cannot intubate, cannot ventilate" scenario, definitive procedures for airway securing were not undertaken, but rather the patients were referred for tracheostomy under local anesthesia first. In face of severe hypoxia and rapid deteriorating of the patient with dropping level of consciousness, the anesthesia team decided to manage the upper airways by endotracheal intubation with Rapid Sequence Induction (6,7). There was no time for attempts, because strong hypnotics and muscle relaxants intubating doses administration ultimately leads to abolishment of life sustaining spontaneous breathing. In face of unsuccessful intubation, to prevent patient's death, a last-ditch attempt would be to perform as quickly as possible one of surgical airway creation procedures, usually this, which the particular surgeon is most familiar with. Even in experienced hands, endotracheal intubation in obese and short-necked asphyxiating patient the face of a nearly total glottic closure is very risky. It necessitated skills, also rapid

and profound muscle relaxation and was enabled with small 5.5 ID laryngeal tube. Only after opening a pre-tracheal fascia and coming across the unintentionally retained gauze (undoubtedly it is ubiquitous medical error) it became obvious that the long-standing neck infection leads to adduction of vocal cords and glottic closure secondary to dysfunction of laryngeal nerves and muscles. Fortunately, the patient was admitted in ED of a referral center for Head Surgery, Neck Surgery and Anesthesiology, where highly experienced staff successfully cured the patient.

## Conclusions

Closed vocal cords cause severely compromised airways and require urgent intubation or tracheostomy. Airway management depends on a variety of factors, including the degree of upper airway obstruction, underlying respiratory function, and life priorities. This case is specifically described to convey the message that there can be an unanticipated and delayed airway compromise even when elective measures are undertaken against a post TT complication, which may cost a patient's life if not immediately attended.

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## Footnote

*Reporting Checklist:* The authors have completed the CARE reporting checklist. Available at <https://gs.amegroups.com/article/view/10.21037/gS-22-534/rc>

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*Ethical Statement:* The authors are accountable for all

aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee(s) and with the Helsinki Declaration (as revised in 2013). Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the editorial office of this journal. The study was approved by the Clinical Research Ethics Committee of the University Hospital “Queen Giovanna – ISUL” at the meeting on 31.08.2022 (No. CREC 2022/166).

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## References

- Chahardahmasumi E, Salehidoost R, Amini M, et al. Assessment of the Early and Late Complication after Thyroidectomy. *Adv Biomed Res* 2019;8:14.
- Ayandipo OO, Adigun TA, Afuwape OO, et al. Airway complications and Outcome after Thyroidectomy in Ibadan: A 15 year review. *Arch Med* 2016;8:7.
- Christou N, Mathonnet M. Complications after total thyroidectomy. *J Visc Surg* 2013;150:249-56.
- Sanapala A, Nagaraju M, Rao LN, et al. Management of bilateral recurrent laryngeal nerve paresis after thyroidectomy. *Anesth Essays Res* 2015;9:251-3.
- Maresch KJ. AANA Journal Course - Vocal Cord Paralysis: Implications for Anesthesia Care. *AANA J* 2021;89:443-8.
- Ryu KA, Seo ST, Rha KS, et al. Life-Threatening Upper Airway Obstruction Caused by Delayed Hematoma Occurring 8 Days Post-Thyroidectomy. *Int J Thyroidol* 2015;8:187-9.
- Mahmood SF, Padmanabha S, Hegde H, et al. “Delayed Stridor following Thyroid Surgery: A Case Report”. *J Evol Med Dent Sci* 2014;3:7563-6.
- Wu C, Da D, Wang J, et al. Dyspnea after thyroidectomy induced by intratracheal lymphoma: A case report. *Mol Clin Oncol* 2019;11:285-8.
- González-Sánchez-Migallón E, Guillén-Paredes P, Flores-Pastor B, et al. Late tracheal perforation after total thyroidectomy. Conservative management. *Cir Esp* 2016;94:50-2.
- Sajid B, Rekha K. Airway Management in Patients with Tracheal Compression Undergoing Thyroidectomy: A Retrospective Analysis. *Anesth Essays Res* 2017;11:110-6.
- Rosenblatt WH, Abrons RO, Sukhupragarn W. Airway management. In: Barash PG, Cullen BF, Stoelting RK, et al. eds. *Clinical Anesthesia*. 8th ed. Lippincott Williams & Wilkins; 2017:767-808.
- Mohtashami S, Richardson K, Forest VI, et al. Thyroidectomy for Graves' Disease Predicts Postoperative Neck Hematoma and Hypocalcemia: A North American cohort study. *Ann Otol Rhinol Laryngol* 2022;131:341-51.
- Brauer PR, Burkey BB, Reddy CA, et al. Risk Assessment in Thyroid Lobectomy and Total Thyroidectomy using Over 100 Thousand Cases. *Ann Otol Rhinol Laryngol* 2021;130:1351-9.
- Butler D, Oltmann S. Is Outpatient Thyroid Surgery for Everyone? *Clin Med Insights Ear Nose Throat* 2017;10:1179550617724428.
- Ahmed SZ, Zafar Z, Waseem T, et al. To Drain or Not to Drain in Thyroidectomy: A Meta-analysis of Outcomes. *Arch Surg Res* 2020;1:6-17.
- Shew M, Boyd C, Kraft S. Delayed Multifocal Tracheal Injury Following Thyroidectomy: A Case Report and Review of the Literature. *Cureus* 2020;12:e8164.
- Shen WT, Kebebew E, Duh QY, et al. Predictors of airway complications after thyroidectomy for substernal goiter. *Arch Surg* 2004;139:656-9; discussion 659-60.
- Seenarain V, Trivedi A, Flukes S, et al. Diagnosis and surgical repair of delayed tracheal perforation post thyroidectomy in context of previous cranio-spinal radiotherapy - A case report. *Int J Surg Case Rep* 2022;91:106761.
- Thurnher D. Coniotomy, a Life-Saving Emergency Measure. In: Klemm E, Nowak A. editors. *Tracheotomy and Airway*. Cham: Springer; 2020:71-80.

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