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Emergency thyroidectomy: Due to acute respiratory failure

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ABSTRACT

INTRODUCTION: Giant cervical and mediastinal goiter may lead to acute respiratory failure caused by laryngotracheal compression and airway obstruction. Here, we present a case admitted to the emergency service with a giant goiter along with respiratory failure and poor general health status, which required urgent surgical intervention.

PRESENTATION OF CASE: A 71-year-old female admitted to the emergency room with shortness of breath and poor general health status resulting from a giant cervical swelling progressively increased during the last 7 years and constituted severe respiratory failure which has become severe in the last one month. A giant nodular goiter of the left thyroid lobe extending retrosternally, causing tracheal compression, limiting the neck movements was detected with clinical examination and bedside ultrasound. Emergency thyroidectomy was planned. Fiberoptic-assisted awake nasal intubation was performed in the operating room. Emergency total thyroidectomy was performed for the life-threatening respiratory failure. Postoperative period was uneventful. She was transferred from intensive care unit to the ward on postoperative day 3 and was discharged from the hospital on the postoperative 7th day. Benign multinodular hyperplasia was reported on the histopathological report. Patient was included in routine follow-up.

DISCUSSION: In the present case tracheal destruction due to compression of the giant goiter was found in agreement with previous reports. Emergency thyroidectomy was performed after awake intubation since it is a common surgical option for the treatment of giant goiter causing severe airway obstruction.

CONCLUSION: Respiratory failure due to giant nodular goiter is a life-threatening situation and should be treated immediately by performing awake endotracheal intubation following emergency total thyroidectomy.

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1. Introduction

Nodular goiter is a common benign disease of the thyroid gland. Diagnose is difficult since patients are mostly asymptomatic in early stages of the disease. When the nodules start to enlarge and cause significant compression symptoms, progressing through the giant goiter, it should be considered carefully and should be treated as soon as possible [1]. It was previously reported that acute respiratory failure resulted from the compression of thyroid gland from the outside of the trachea or tracheal luminal invasion, can be a

life-threatening situation and requires urgent surgical intervention [2]. Thyroid diseases such as giant cervical and mediastinal goiter, intrathyroidal hemorrhage, primary or metastatic thyroid malignancies may lead to acute respiratory failure by laryngotracheal compression and airway obstruction. Herein we present a case of giant goiter admitted to the emergency service with respiratory failure and required urgent surgical intervention.

2. Presentation of case

A 71-year-old female suffering from a giant cervical swelling for 7 years presented to the emergency room with shortness of breath, poor general health status and syncope. The swelling has been progressively enlarging during the last one month and constituted severe respiratory failure. She was subsequently admitted to the hospital. Her stated medical history included hypertension. On the examination, she was found to be severely dyspneic. Thus,

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Picture 1. Physical examination was significant for giant cervical swelling.

arterial blood gas analysis (ABGA) was performed and respiratory acidosis was detected due to hypoxia with pH of 7.29, oxygen partial pressure (pO_2) of 41, carbon dioxide partial pressure (pCO_2) of 65 mmHg, oxygen saturation of blood (sO_2) of 69% and bicarbonate (HCO_3) concentration of 30.1 mEq/L.

Oxygen therapy and medical therapy were initiated immediately. Her physical examination showed that she had a significantly large retrosternal goiter which was compressing the trachea (Picture 1). CT scan could not be performed because of the poor general health status of the patient. A giant goiter of the left lobe extended retrosternally was detected by ultrasound. As dyspnea was severe, emergency tracheotomy was planned primarily. However, the excessive size of the thyroid enforced us to transfer the patient to the operation room promptly to perform emergency thyroidectomy. As a perioperative tracheostomy was required, an otolaryngologist was invited to the operation room. Classical Kocher incision was performed following the application of the fiberoptic-assisted awake nasal intubation. Both lobes of the thyroid gland were detected to be enlarged and were causing tracheal compression. Additionally, inferior part of the left lobe was found to be extended retrosternally. Bilateral total thyroidectomy was performed (Picture 2). Shape of the trachea was slightly dysmorphic

due to tracheal compression, however the consistency of the tracheal tissue was normal. Thus, no intraoperative tracheostomy was required and the surgery was ended. No complication was seen after surgery. The laboratory test results were in normal ranges. Patient was transferred from intensive care unit to the ward on postoperative day 3 and was discharged from the hospital on the postoperative 7th day as the postoperative period was uneventful. Benign multinodular hyperplasia was reported on the histopathological report of surgical specimen. Patient was included in routine outpatient follow-up and treated with levothyroxin sodium tablets 100 mcg/day.

3. Discussion

Acute respiratory failure is a condition that occurs as a result of craniocerebral trauma, central nervous system diseases which depress the respiratory center, chronic obstructive pulmonary diseases and also may be connected with the presence of thyroid gland diseases [3]. Tracheal compression changes and severe tracheal stenosis because of giant goiter are the common causes of thyroid-related respiratory failure [4]. Giant goiter with acute respiratory failure is not a common case contemporarily due to the current improvements in health system, progress of the diagnostic tests and better therapy options.

In giant goiter cases, thyroid is mostly retrosternally extended. CT scan has a great value for the preoperative evaluation of the case. CT scan is a very satisfying for showing the size, substernal and mediastinal extension of the thyroid gland and its invasion in surrounding tissues and the organs [5]. However, CT scan could not be performed in our case due to the existence of severe respiratory failure and poor general health status of the patient. Instead, bedside ultrasound which was performed at the emergency service achieved to detect a giant goiter causing tracheal compression and the retrosternally extended left lobe.

Securing the sustained airway opening of the patient has a priority in the treatment of the giant goiter which causes respiratory failure. Thus, intervention of an anesthesiologist should be the first step of management in such emergency cases. Since during the classical endotracheal intubation complete airway obstruction can occur after the loss of consciousness and the patient may not be intubated promptly, it should be avoided in such cases. [2] Thus, fiberoptic-assisted awake intubation is the gold standard of the endotracheal intubation in giant goiter cases with respiratory



Picture 2. Surgical specimen of goiter.

failure. Although there have been numerous previous case reports on emergency thyroidectomy, as the trachea of the patient was destructed because of the pressure of giant thyroid in this case, the present manuscript suggests a new approach to emergency thyroidectomy with nasal awake intubation.

Surgical intervention should be planned after the endotracheal intubation was completed. Emergency thyroidectomy is a common surgical option for the treatment of giant goiter which causes severe airway obstruction [6].

Emergency tracheostomy is not an appropriate procedure since the massive size of the thyroid gland prevents the access to the trachea [7]. Furthermore, in such cases tracheostomy may lead to uncontrolled hemorrhage, even death. Therefore, it is suggested that emergency thyroidectomy should be performed prior to the emergency tracheostomy in these cases [6]. Surgical management of retrosternal and mediastinal extended giant goiters are rather complicated. The risks of complications such as tracheal damage, recurrent nerve injury, pneumothorax and intraoperative hemorrhage are higher in these patients [8]. Total thyroidectomy by cervical approach with Kocher incision can be performed to treat giant goiters located retrosternally. However, sternotomy and thoracotomy may be required for surgical approach to giant goiters with severe mediastinal extension [9].

Tracheomalacia, caused by dysmorphia such as decreased tracheal tone and softening or loss of consistency of the tracheal tissue can be detected commonly following the thyroidectomy in the giant goiter cases. It is a very serious complication resulted in severe acute respiratory failure caused by collapsed trachea after extubation. This complication may occur in the giant goiter cases with a significant tracheal compression for more than 5 years [10].

Only experienced endocrine surgeons can handle the complications of giant goiter cases accompanied with tracheal compression, such as nerve palsy and tracheomalacia. Routine use of nerve monitoring system recently introduced can help the surgeons to minimize these damages.

4. Conclusion

As a result, acute respiratory failure caused by giant goiter is a life-threatening situation and requires emergent endotracheal intubation. These cases should be managed in the fully equipped and experienced medical centers by emergent total thyroidectomy.

Conflict of interest

All authors have declared that they have no conflict of interest.

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Ethical approval

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 Editor-in-Chief of this journal on request.

Since patient identifying information was not included in this report, Institutional review was not required for this study.

Author contributions

Zulfu Bayhan, Sezgin Zeren, Bercis Imge Ucar and Isa Ozbay designed the study, assembled the scientific background of this case report and drafted the manuscript. Metin Mestan and Yalcin Sonmez carried out the bilateral total thyroidectomy. Onur Balaban and Nilufer Araz Bayhan carried out the fiberoptic laryngoscopy and performed awake intubation. Mehmet Fatih Ekici proofread the manuscript. All authors meet the ICMJE criteria for authorship for this manuscript and read and approved the final manuscript.

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