

## ■ Case Report

# Management of difficult intubation in the case with substernal goiter underwent cardiac surgery

## *Kalp cerrahisi geçirmiş olan substernal guatr olgusunda zor entübasyon yönetimi*

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### ABSTRACT

Redo thyroid surgery is difficult for several reasons and may be complicated. In some cases airway management can be more difficult unexpectedly. In this situation, special airway devices may be required. Here we present a case of a 67-year-old female patient who suffer from recurrent substernal goiter and has dyspnea, cough, and fatigue. In this case, difficult intubation was managed with a gum elastic bougie that was placed into the classical laryngeal mask airway. Laryngeal mask airway was removed while gum elastic bougie was left in place to guide endotracheal tube insertion. The endotracheal tube was slipped over gum elastic bougie. In cases of difficult intubation, endotracheal intubation can be achieved with the guidance of gum elastic bougie placed through the laryngeal mask airway.

**Key words:** Difficult intubation, substernal goiter, laryngeal mask airway, gum elastic bougie

### ÖZ

Redo tiroid cerrahisi çeşitli nedenlerle zor ve karmaşık olabilir. Bazı olgularda hava yolu yönetiminde, beklenmedik şekilde zorluklarla karşılaşılabilir. Bu durumda özel hava yolu ekipmanı gerekebilir. Biz 67 yaşında, solunum sıkıntısı, öksürük ve yorgunluk yakınmaları olan tekrarlayan substernal guatr tanısı olan kadın olguda zor entübasyon yönetimimizi sunmayı amaçladık. Bu olguda önce klasik laringeal maske hava yolu içine gum elastik buji yerleştirildi. Endotrakeal tüp yerleştirmeye kılavuz olması için gum elastik buji yerinde bırakılırken laringeal maske hava yolu çıkarıldı. Gum elastik buji üzerinden kaydırılarak endotrakeal tüp yerleştirildi. Zor entübasyon olgularında, laringeal maske hava yolu içinden yerleştirilen gum elastik buji ile başarılı endotrakeal entübasyon sağlanabilir.

**Anahtar kelimeler:** Zor entübasyon, substernal guatr, laringeal maske havayolu, gum elastik buji

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## Introduction

Substernal goiter, defined as the positioning of the thyroid tissue under manubriosternal junction, has an incidence of 0.2-4.5% [1]. Recurrent substernal goiter, regeneration of thyroid tissue after thyroid gland surgery, has an incidence of 2.3% [2]. Redo thyroid surgery is difficult for several reasons such as adhesions, edema, fibrosis, and anatomic disturbances, may be complicated with the risk of recurrent laryngeal nerve injury [3]. In addition, substernal goiter may lead to alterations in airway anatomy by mass effect, thereby predisposing the risk for difficult intubation. In this case report, we aimed to present management of difficult intubation due to a recurrent goiter mass that was located substernally resulting in the displacement of the trachea.

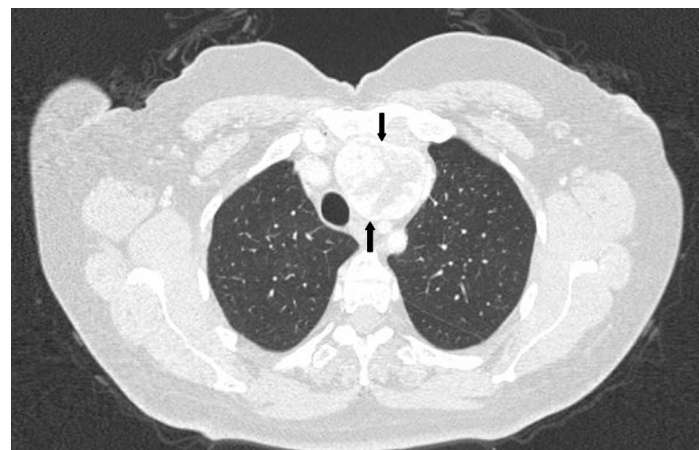
## Case

After obtaining written informed consent of the patient, we presented a 67-year-old female patient with 155 cm height and 82 kg body weight. She underwent thyroidectomy due to nodular goiter 10 years ago and coronary bypass graft surgery due to coronary artery disease 8 years ago. She was taking metformin, captopril, and thyroid hormone replacement due to type 2 diabetes, hypertension, and hypothyroidism. Upon presenting to the general surgery outpatient clinic with complaints of dyspnea, cough, and fatigue, she was diagnosed with substernal goiter. A team of general and cardiovascular surgeons planned to perform median sternotomy and thyroidectomy for substernal goiter. Cardiovascular surgeons performed an angiography and showed that anastomoses of previous surgery were open. In pre-anesthetic evaluation, scar tissues were observed at midline of the neck and sternum corresponding to the previous thyroidectomy and coronary bypass graft surgery, respectively. Mallampati score was found as II. No other physical examination abnormality was detected. Laboratory tests showed normal parameters except low hemoglobin level (11.5 g/dL). In thorax computerized tomography scan, a mass extending from left paratracheal area to prevascular area was visualized at thoracic inlet, which was 51x45 mm at its widest axis. This mass was compressing to left internal jugular and brachiocephalic veins and displacing trachea and left carotid artery (Figure 1). The mass was also seen to compress the aorta (Figure 2 or where is fig 1?). Appropriate measures for possible difficult intubation and blood products were prepared during preoperative period. After monitoring ECG, pulse oximetry, and invasive arterial blood pressure in operating room, anesthesia was induced by fentanyl 2 µg/kg, propofol 2.5 mg/kg, and rocuronium 0.6 mg/kg. When laryngoscope was placed for intubation, only hard

palate was observed, which was accepted as Grade 4 according to Cormack-Lehane classification [4]. Immediately after failed attempt to intubate by laryngoscope, LMA Classic (LMA-C, Laryngeal Mask Company Ltd., Henley-on-Thames, UK) was placed. Afterwards, gum elastic bougie was inserted through LMA. Gum elastic bougie (Flex Guide, Sunmed, Michigan, USA) was left in the trachea and LMA was removed. Endotracheal tube (ETT) was introduced into the trachea over the gum elastic bougie. The place of ETT was confirmed by capnography and auscultation of lungs and stomach. Surgical field preparation and draping were followed by Kocher's incision to enter thyroid lodge. Mini sternotomy was performed by sternal saw to remove thyroid tissue extending retrosternally. Thyroid tissue was transected by preserving parathyroid glands and checking for inferior laryngeal nerve by nerve monitor. Thyroid was removed. After establishing hemostasis, sternum and other layers were closed in anatomically appropriate form. The patient was hemodynamically stable for the entire 85-minute surgery followed by an uneventful postoperative period.



**Figure 1.** The mass compressing left internal jugular and brachiocephalic veins and displacing trachea and left carotid artery is displayed.



**Figure 2.** The mass is seen to be located posterior to the sternum and compress the aorta.



## Discussion

After classical LMA designated by Dr. Brain [5]. Various LMA forms such as LMA Unique, LMA ProSeal, LMA Supreme and Cobra perilyngeal airway are produced and used as supraglottic devices [6,7]. LMA is vital in difficult intubation cases by providing ventilation and oxygenation [8]. Today, supraglottic devices were included to the difficult airway algorithm of American Society of Anesthesiologists [9]. The technique of inserting ETT in the guidance of gum elastic bougie which is advanced through previously inserted LMA that is removed after bougie is left is already described in the literature [10]. In our case, the patient had no known difficult intubation history in her previous surgeries. However, substernal goiter patients have the potential for difficult intubation due to altered anatomy. In this case, we performed ETT by gum elastic bougie that we placed via LMA. We suggest this method to be considered in such difficult intubation situations where opening of airway is compelling.

## Declaration of Conflict of Interest

There is no person / organization that financially supports work, and there is no conflict of interest between the authors.

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