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Case Report

Use of Video Laryngoscopy in a Patient with Huge Thyroid Mass: A Case Report

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ABSTRACT

Video laryngoscopy has opened its way into airway management and continues to play a larger role in managing patients with difficult airway. Anesthesiologists use video laryngoscopy more often every day and therefore accept the risks of more challenging and difficult airway situations with more confidence.

In the mentioned case below, a 45-year-old female with a large thyroid mass is presented to an academic based hospital, for elective thyroidectomy. The patient was intubated using a video laryngoscopy technique and the airway was secured.

Video laryngoscopy helps secure difficult airways and could be chosen as first line option in such situations.

Patients with large thyroid masses are categorized as patients with difficult airway. Patients with difficult airway present a challenging situation to every anesthesiologist. Unlike the unanticipated difficult airway algorithm [1], which outlines a step wise approach to management of difficult airway, management of patients with anticipated difficult airway is not clearly defined. Currently patients with anticipated difficult airway are managed based on the anesthesiologists' preference and experience and the decision is taken based on every patient's unique airway characteristics.

Awake fiberoptic intubation, awake intubation using direct laryngoscopy, awake intubation with volatile anesthetics, quick look under sedation before deciding on the actual plan, local tracheostomy are some of the more common options which every anesthesiologist decides between when faced with an anticipated difficult airway [2-5].

Nowadays, video laryngoscopes are more readily available in the operating rooms and are being used more frequently in the management of both anticipated and unanticipated difficult airway management.

In the patient presented below, we present a patient with anticipated difficult airway whose airway was secured using video laryngoscopy.

Case Report

A 45-year-old female presented to Shariati hospital (An academic hospital affiliated with Tehran University of Medical Sciences) with palpitation, wheezing, functional class II dyspnea. She did not complain of dysphagia, hoarseness, stridor, or edema.

Her past medical history included thyroid goiter. In addition to goiter, she was diagnosed with diabetes mellitus. She was under treatment with Inderal 30 mg daily, propylthiouracil, and methimazole (both three times per day). She was afebrile.

Physical exam revealed a height of 171 cm, and weight of 73 Kg. Her vital signs were stable; a huge enlarged movable mass was observed and palpated on the anterior aspect of the neck which was not painful or tender.

CT of the neck revealed a huge lobulated multi nodular goiter with coarse calcified foci and cystic components (the largest nodule 37mm) in the left lobe with

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retrosternal extension that compressed and displaced adjustant structures.

The trachea was anteriorly and laterally displaced at level of fifth cervical vertebra. There was mild irregular tracheal narrowing along the thyroid mass. No adenopathy were detected. Vasculature was intact. She was elected for subtotal thyroidectomy.

On arrival to the operating room, standard monitoring, including ECG, NIBP, HR, and SpO2, was initiated.

After pre-oxygenation and administration of 2mg of midazolam and 30mg of propofol, a preliminary awake laryngoscopy using C-MAC® video-laryngoscope (Karl Storz Endoscopy-America, CA, USA) revealed adequate laryngeal view (a Cormack-Lehane grade I view of laryngeal aperture). Then, she received, 1.5mg/kg propofol, 2ug/kg fentanyl and 1.5 mg/kg of succinylcholine. Endotracheal intubation was performed using an armored endotracheal tube (size 7.0 internal diameter) which was passed through the vocal cords without any difficulty.

The surgery successfully removed the mass via the cervical approach and the patient was transferred to the intensive care unit, where she was extubated successfully when fully awake and obeying commands.

Figure 1- The thyroid mass observed while the patient is lying supine on the operating table.

Discussion

Difficult airway is defined as the clinical situation in which a conventionally trained anesthesiologist experiences difficulty with facemask ventilation of the upper airway, difficulty with tracheal intubation, or both [6]. Although there are some independent risk factors specific to every patient which helps predict them to have a difficult airway, but based on the mentioned definition, expressing a clinical situation to be classified as “difficult airway management” is strongly dependent on the person who is responsible for the management of that state. Thus, outlining a step wise approach to difficult airway management which everyone agrees on is challenging.

Video laryngoscopes have become widely available in operating rooms and are becoming part of everyday practice. Their ease of use and quick learning curve has made them very popular in both teaching tracheal intubation to students and management of difficult airways [7].

At our center, Shariati Hospital, we have over 400 thyroidectomy surgeries performed every year. The Endocrinology and Metabolism Research Institute (EMRI), which is affiliated to Tehran University of Medical Sciences (TUMS), is based in Shariati Hospital, and over two-thirds of our patients are individuals who are referred from EMRI due to various thyroid diseases needing surgeries.

In the case presented above we used a preliminary awake laryngoscopy using video laryngoscope under mild sedation for evaluating the laryngeal view before full induction of anesthesia which should be approached to with caution as it has its own risks.

Trachea deviation, compression of trachea, anatomical distortion, extension of the mass into the thorax cavity are risk factors related to thyroid masses which should be taken into account when planning to intubate such patients.

In our experience, mild deviation of trachea can easily be approached to with direct laryngoscopy. Mild compressions of trachea in non-solid masses are also not usually problematic. One of the important alarm signs when deciding to intubate a patient with thyroid disease is palpation of a firm fixed thyroid mass.

Currently, in patients with large thyroid masses and patients with deviated trachea whom are classified as difficult intubation patients, we routinely use video laryngoscopes as the first line intubation device.

There are a variety of options for every anesthesiologist when faced with a thyroid mass.

One of the favorable options is fiberoptic intubation.

Although many authors favor the use of fiberoptic intubation in patients with thyroid masses [8-11], we believe that in instances where we are faced with large thyroid masses and deviated trachea it is impossible to do

an airway nerve block or ask the patient to comply with laryngoscopy under the oral local anesthesia.

Surgical airway is also another option which has its own cons and pros but is not advised as much as it used to be in the past, and it should be remembered that in patient with large thyroid masses, tracheostomy surgery is very challenging and time consuming.

Even extracorporeal membrane oxygenation assisted surgery has been proposed in rare cases with very large retrosternal masses, but it is usually a remote option especially in places with less equipped operating rooms [11].

Video laryngoscopes should be considered as the first line option in management of patients with thyroid diseases.

Overall thyroid masses have various characteristics, and cause many different implications on the airway which are hazardous in securing the airway.

Every anesthesiologist should be fully aware of the extent to which the airway is compromised and proceed based on the availability and expertise and experience that he or she has.

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References

[1] Frerk C, Mitchell VS, McNarry AF, Mendonca C, Bhagrath R, Patel A, O'sullivan EP, et al. Difficult Airway Society 2015 guidelines for management of unanticipated difficult intubation in adults. Br J Anaesth. 2015; 115(6):827-48.

[2] Fitzgerald E, Hodzovic I, Smith AF. 'From darkness into light': time to make awake intubation with videolaryngoscopy the primary technique for an anticipated difficult airway? Anaesthesia. 2015; 70(4):387-92.

[3] Malpas G, Hung O, Gilchrist A, Wong C, Kent B, Hirsch GM, Hart RD. The use of extracorporeal membrane oxygenation in the anticipated difficult airway: a case report and systematic review. Can J Anaesth. 2018; 65(6):685-97.

[4] Nørskov AK, Rosenstock CV, Wetterslev J, Astrup G, Afshari A, Lundstrøm LH. Diagnostic accuracy of anaesthesiologists' prediction of difficult airway management in daily clinical practice: a cohort study of 188 064 patients registered in the Danish Anaesthesia Database. Anaesthesia. 2015; 70(3):272-81.

[5] Heidegger T. Difficult Airway Society guidelines 2015: what about the anticipated difficult airway?. Anaesthesia. 2016; 71(4):467-8.

[6] Henderson JJ, Popat MT, Latto IP, Pearce AC. Difficult Airway Society guidelines for management of the unanticipated difficult intubation. Anaesthesia. 2004; 59(7):675-94.

[7] Niforopoulou P, Pantazopoulos I, Demestiha T, Koudouna E, Xanthos T. Video-laryngoscopes in the adult airway management: a topical review of the literature. Acta Anaesthesiol Scand. 2010; 54(9):1050-61.

[8] Baik FM, Zhu V, Patel A, Urken ML. Airway management for symptomatic benign thyroid goiters with retropharyngeal involvement: Need for a surgical airway with report of 2 cases. Otolaryngology Case Reports. 2018; 7:10-2.

[9] Paul M, Kannaujia A, Chatterjee A, Mayilvaganan S. Serial fiber optic bronchoscopy (FOB) to predict the need of tracheostomy in tracheomalacia after thyroidectomy in long standing goiter. J Clin Anesth. 2018; 47:9-10.

[10] Shamim F, Yahya M, Ikram M. Awake fiberoptic intubation in a patient with known difficult airway due to huge thyroid goiter. Anaesth Pain & Intensive Care 2017;21(1):94-97.

[11] De Piero ME, Fontana D, Quaglino F, Attisani M, Baroncelli F, Cavallo A, et al. Extracorporeal membrane oxygenation (ECMO)-assisted surgery for mediastinal goiter removal. J Cardiothorac Vasc Anesth. 2018; 32(1):448-51.