



Managing an Awake Fiberoptic Intubation in Thyroidectomy for a Morbidly Obese Patient with Massive Submental and Substernal Goiter



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INTRODUCTION

Thyroidectomy is the most common endocrine surgery in the world with multinodular goiter accounting for approximately 12% of thyroid surgeries. The presence of a large goiter poses a unique challenge to airway management for a variety of reasons:

- Significantly distorted upper airway anatomy can preclude the use of airway devices such as supraglottic airways and impair visualization of the glottis.
- Goiters with substernal extension may compress and deviate the trachea, making intubation and potential surgical airway difficult or impossible.
- Loss of pharyngeal and laryngeal tone post-induction can further exacerbate these challenges, potentially causing complete airway collapse with inability to ventilate or intubate.
- Lastly, performing a surgical airway in a patient with massive goiter poses significant challenge due to distortion of typical anatomic landmarks and increased bleeding risk.
- The World Health Organization (WHO) grades goiters on visibility with a scale of zero to three, with grade three representing a goiter that is “very pronounced, with potential difficult breathing”

Consequently, additional considerations are needed to safely secure the airway in this patient population.

CASE DESCRIPTION

41 -year-old female presenting for **total thyroidectomy for resection of massive goiter**. Medical history notable for morbid obesity (weight 165kg, BMI 68), untreated OSA, and large bilateral goiter extending superiorly behind the mandible and inferiorly below the sternum. ENT was consulted prior to case and noted they would not be able to perform a surgical airway on this patient.

PHYSICAL EXAM: Limited neck mobility secondary to the goiter and a Mallampati score of IV.



IMAGING: Thyroid ultrasound revealed thyroid lobe sizes 11.3x6x7 cm on right and 10.7x5x4 cm on left. CT chest revealed circumferential compression of the trachea.



ANESTHETIC MANAGEMENT: AIRWAY TOPICALIZATION

Antisialagogue: 0.2 mg glycopyrrolate IV was given 20 min prior to topicalization to decrease oral secretions

Nebulized Topicalization: 3 ml of 4% lidocaine was administered by nebulizer in the preoperative area

Sedation: 2 mg of midazolam were administered following nebulization with an additional 4mg given in the operating room over spaced-out intermittent boluses for anxiolysis and amnesia during the remainder of the topicalization

Glossopharyngeal Nerve

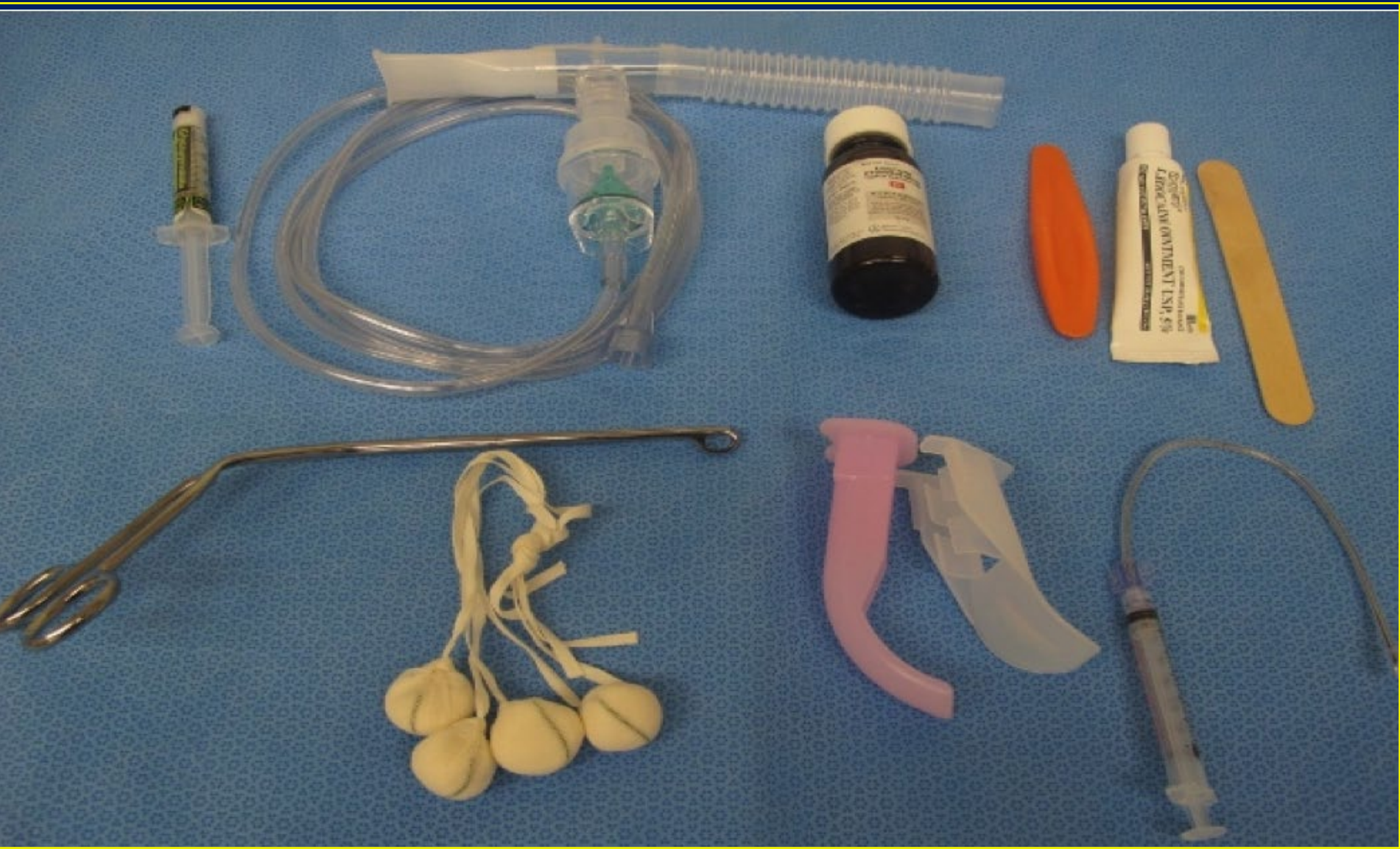
Topicalization: 5% lidocaine ointment applied to the base of the tongue

Superior Laryngeal Nerve

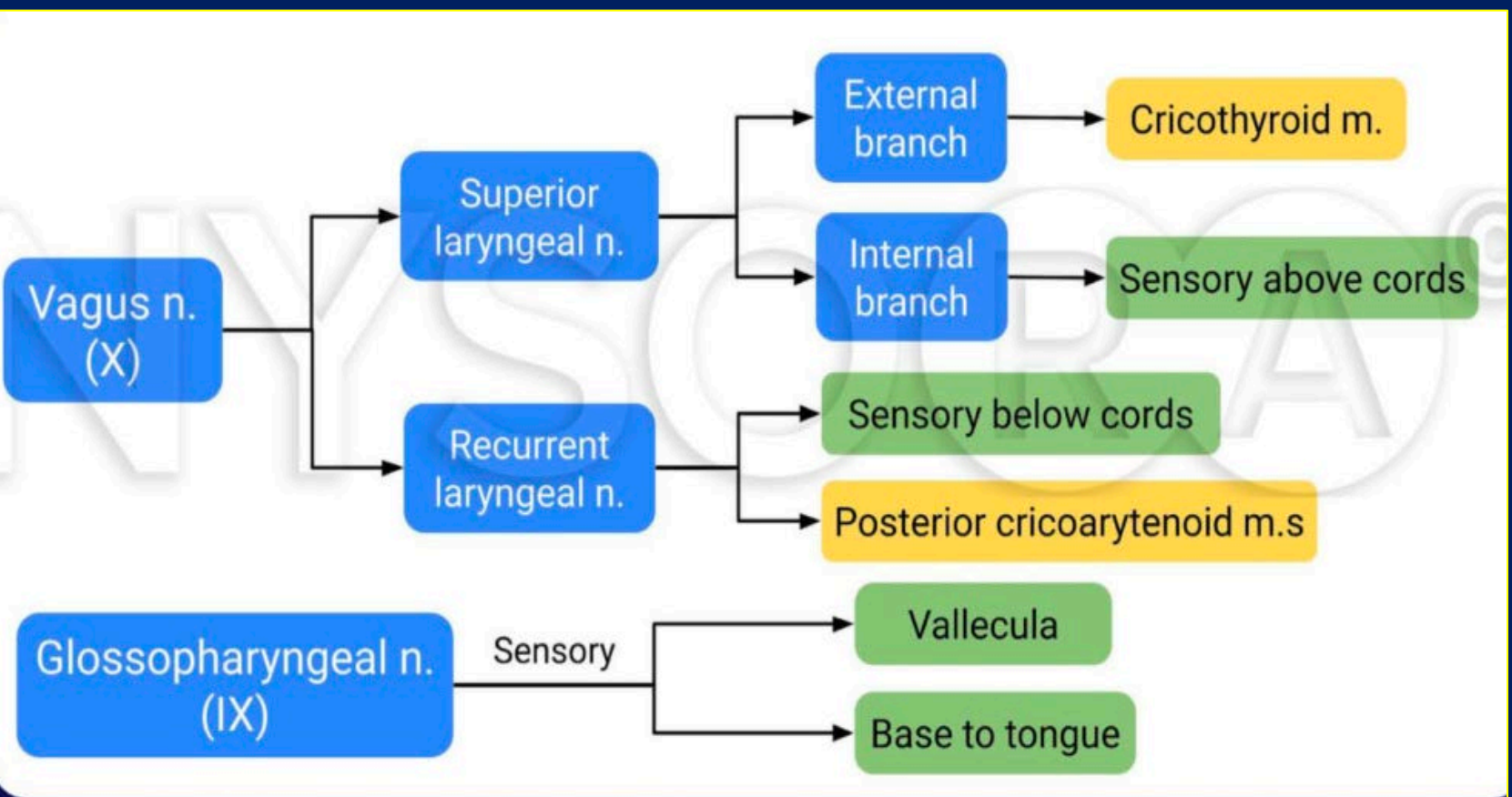
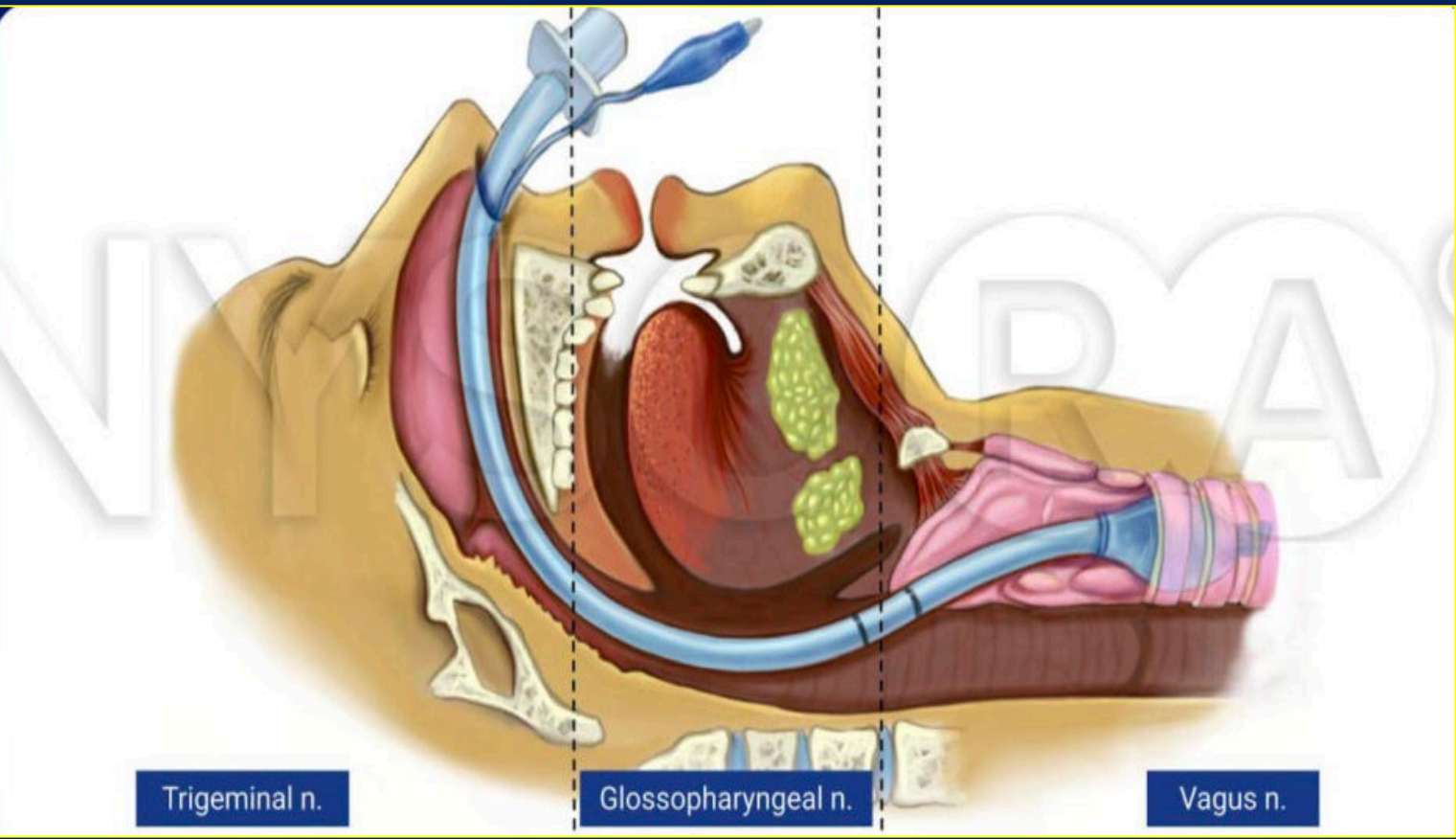
Topicalization: pledgets with 4% lidocaine applied to bilateral tonsillar pillars

Recurrent Laryngeal Nerve

Topicalization: Williams airway placed and 3 cc of 4% lidocaine sprayed through the Williams airway using laryngo-tracheal atomizer device to anesthetize vocal cords



INNERVATION OF THE AIRWAY



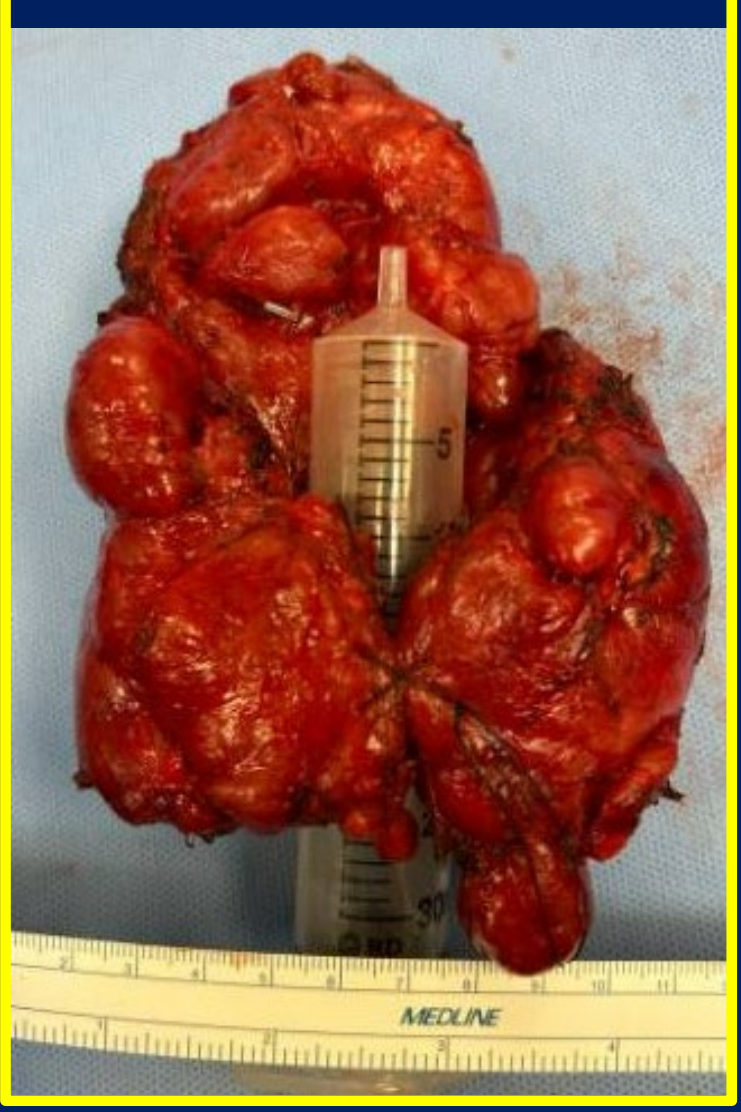
Ahmad, I. Regional and Topical Anesthesia for Awake Endotracheal Intubation. NYSORA.

ANESTHETIC MANAGEMENT: AWAKE FIBEROPTIC INTUBATION

- A Bflex2 5.0 glidescope bronchoscope pre-loaded with a 7.0 Nerve Integrity Monitor (NIM) endotracheal tube was advanced through 100 mm Williams airway with mild difficulty getting past large tongue.
- Williams airway facilitated immediate visualization of larynx upon passing tongue.
- The FOB was advanced through the vocal cords, and the ETT was successfully guided into the trachea, encountering resistance that required careful manipulation.
- Placement of ETT was verified via end-tidal CO2 and visualization of tracheal rings and carina with fiberoptic bronchoscope.
- Oxygenation was maintained via 6L nasal cannula throughout the process of awake FOI.
- Anesthesia was subsequently induced, and thyroidectomy successfully performed.
- Patient was extubated smoothly following removal of the goiter after spontaneous breathing confirmed with adequate tidal volumes.



DISCUSSION AND RECOMMENDATIONS



Awake fiberoptic intubation is the gold standard for management of predicted difficult airway. Patient factors such as high BMI, limited mouth opening, higher Mallampati score, and minimal neck mobility are indicators of a difficult airway, but do not alone always necessitate awake FOI. The presence of a massive, retrosternal goiter can lead to airway distortion and tracheal compression as seen on our patient’s CT. Classification based on anatomy recommends awake fiberoptic intubation for any type 3 goiter, defined as a substernal goiter with significant intrathoracic mass as induction prior to securing the airway could lead to a life-threatening “cannot ventilate, cannot oxygenate” scenario. Additionally, emergency surgical airway can be impossible or pose significant bleeding risk and challenge due to distorted anatomy and body habitus. Given these factors, awake FOI was the safest choice for this patient. Additionally pre-procedurally adequate airway topicalization along with patient education and cooperation can increase rates of successful intubation, reduce adverse events, and improve the patient experience.

REFERENCES

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