

Introduction

Tracheostomy is a relatively common hospital procedure that can be performed surgically via an open approach or a percutaneous approach. Furthermore, these procedures can be done with the patient awake often with the aid of local anesthetics, nerve blocks, and sedation or it can be done with the patient fully asleep via general anesthesia. General anesthesia is typically used if upper airway anatomy allows for vocal cord visualization and endotracheal tube insertion. An awake approach with local anesthesia is typically used if anatomical abnormalities, such as laryngotracheal dislocations and supraglottic masses, interfere with oral access or ability to ventilate the patient. Options for local anesthesia include topic anesthetic ointment, transtracheal injection, and nerve blocks [1]. Nerves to consider targeting with the block include the glossopharyngeal, superior laryngeal, recurrent laryngeal nerve, sphenopalatine, and anterior ethmoidal nerves.

Patient preparation in awake tracheostomy includes patient counseling on expectations and administration of antisialagogues, such as glycopyrrolate, to minimize the impact of secretions of local anesthetic efficacy [2]. Sedative agents are also typically used for patient comfort with the goal of the patient being cooperative but able to maintain spontaneous breathing [1]. Options for sedation include propofol, benzodiazepines, dexmedetomidine, and ketamine. Lastly, patient positioning including cervical spine extension with shoulder elevation is ideal for this procedure

Case Presentation

85-year-old male with past medical history significant for HTN, HLD, ambulatory dysfunction, dementia, prostate cancer, and prior ACDF at C3-C7 who initially presented as a transfer from smaller outside hospital with a wound infection of his foot. During his hospitalization he was evaluated for dysphagia and found to have an obstructive right supraglottic mass, 2.7cm x 2.3cm concerning for malignancy. Associated symptoms included odynophagia, dyspnea, voice changes, and weight loss. Further airway evaluation by ENT revealed narrowed airway with immobile right true vocal fold and hypomobile left true vocal fold. Given the concern for pending airway compromise, a plan was made for tracheostomy.

Pre-operative Course and Preparation

Due to the anatomical difficulties of navigating around the supraglottic mass and his fixed range of motion in his cervical spine due to his history of ACDF, the decision was made to proceed with an awake open tracheostomy in hopes of preserving spontaneous ventilation. Because of his limited range of motion, the patient was unable to provide further cervical extension that typically provides good surgical exposure of the anterior neck. It was discussed by the ENT team that because of this limitation, their dissection would be technically difficult and possibly more stimulating as they would have to lift tissue anteriorly to properly dissect and expose.

Intra-operative course

To begin, the patient was given 10cc of 1% lidocaine to the anterior aspect of the neck while the anesthesia team began a dexmedetomidine infusion with small boluses of propofol and fentanyl to achieve adequate anesthesia and analgesia. The goal was to achieve adequate analgesia while maintaining spontaneous ventilation and avoiding patient disinhibition.

As expected, the patient's fixed neck position and his discomfort with any attempts to manipulate his neck position made the case technically difficult as surgical exposure was sub-optimal leading to slower dissection. However, continued reassurance and titration of medication by the anesthesia team helped keep the patient comfortable, calm, and safe.

Once the tracheostomy was completed and an airway was established the decision was made to switch to general anesthesia so that biopsies of the mass could be performed and to evaluate airway dynamics. The rest of the procedure went without issue.

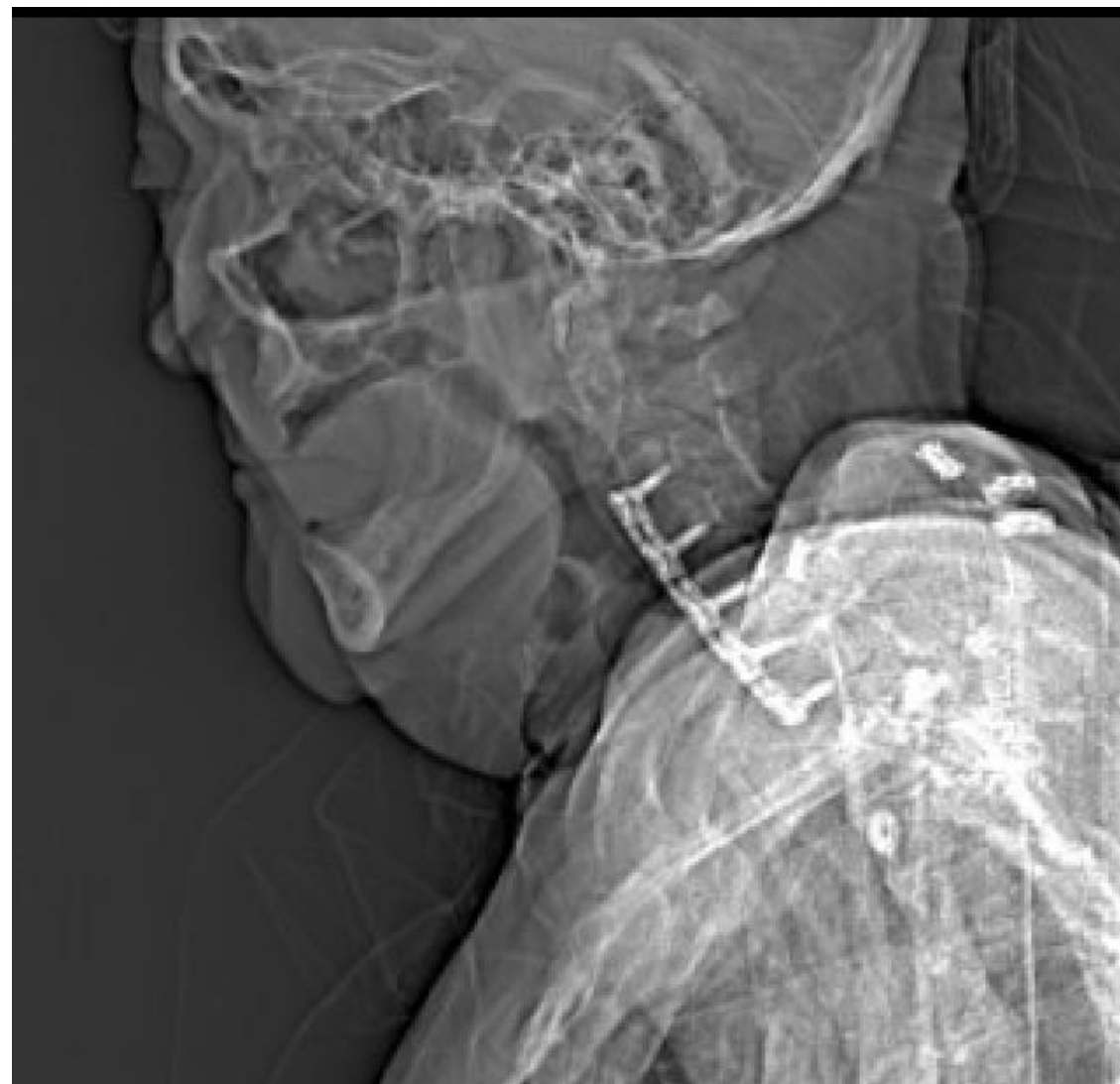


***Figure 1:* CT imaging revealing patient's hardware from his previous C3-C7 ACDF**



***Figure 2:* CT of patient's neck in the sagittal view revealing his supraglottic mass and the concern for airway compromise**

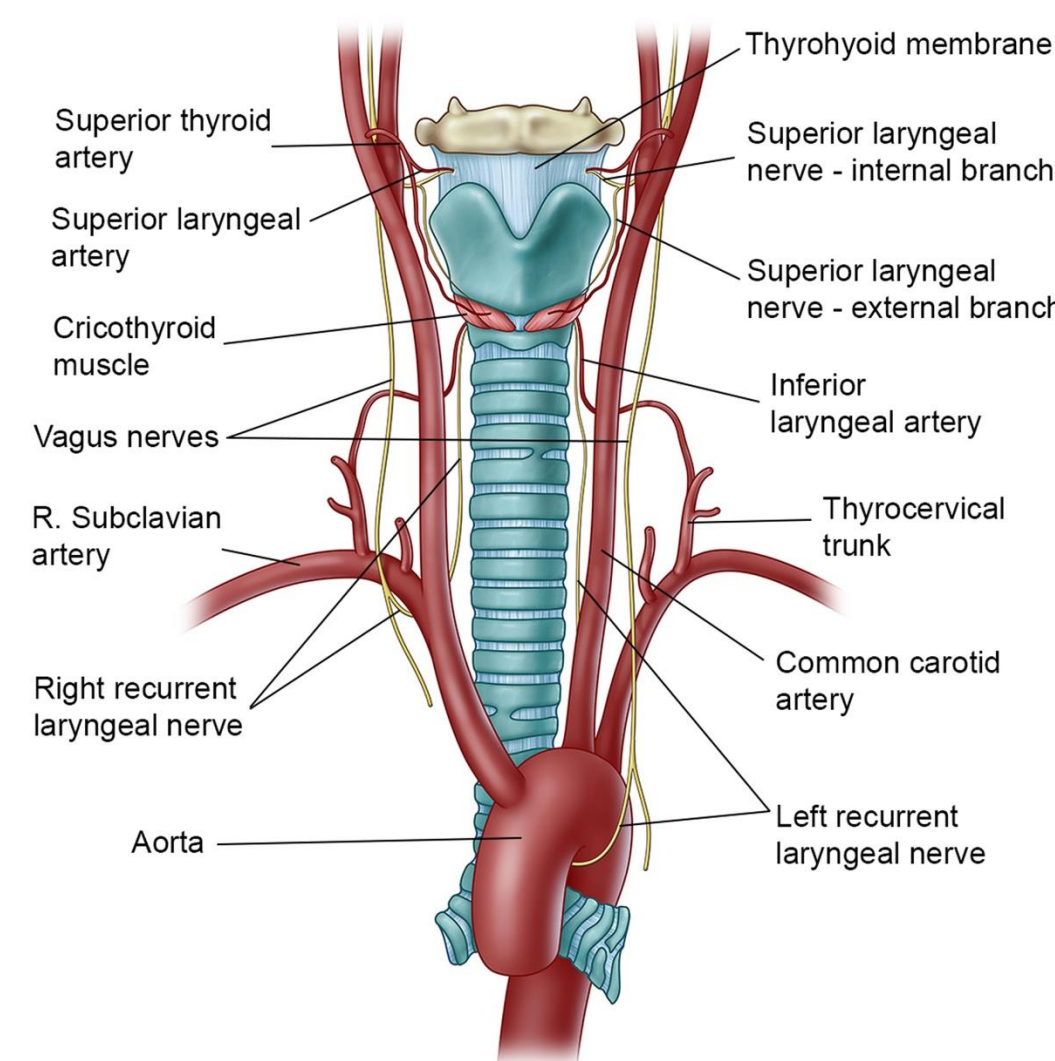


***Figure 3:* Relevant anatomy to consider when planning local anesthetic and nerve block in awake tracheostomy.**

Discussion

The success of an awake tracheostomy is dependent on careful planning, both surgically and anesthetically, to ensure adequate sedation and patient comfortability, while maintaining patient's spontaneous breathing.

Tracheostomies can be technically challenging in patients with ACDF fusion, such as in this case. Typical tracheostomy tube placement is between the 1st and 3rd tracheal rings which are in close proximity to C6 and C7 [4]. The limited mobility in patients with this fusion can pose complications for the surgical team. This emphasizes the importance of positioning for successful completion of the procedure.

Careful anesthesia planning is essential to ensure patients can tolerate the procedure is paramount. Pre-procedure this includes conversations surrounding realistic expectations with the patient. Intra-operatively conversations with both the patient and ENT guide anesthetic management. Titration of medication is based on patient cues while being careful not to disinhibit the patient as spontaneous breathing is essential prior to tracheostomy placement confirmation and transition to general anesthesia.

Conclusion

Tracheostomies can be done in a variety of different ways with different surgical and anesthesia approaches. It is important for both teams to consider the patient's anatomy, their pathology, their preference in approach, their acuity, the nature of their presentation whether it be an emergency vs planned/elective, and whether or not they can cooperate with the surgical and anesthesia team should an awake tracheostomy is planned

Communication between all three parties is key in performing a successful tracheostomy. From an anesthesia perspective it is also very important to be able to pivot should the initial plan and approach be unsuccessful. That means being able to switch from awake to asleep tracheostomy or from local anesthesia to general anesthesia. It is also important for the practitioner to be able to secure an airway should surgical approach be difficult. This may include having to use fiberoptic and or video laryngoscopy to secure an airway

References

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