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# Tracheal invasion by Thyroid nodule in Thyroidectomy

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## Case Presentation:

40yo female ASA 2 presented for total thyroidectomy and neck dissection secondary to papillary thyroid carcinoma. After uneventful induction and intubation, surgical dissection revealed invasion of a thyroid nodule into the anterior branch of the recurrent laryngeal nerve as well as invasion through the first tracheal ring. The tracheal defect was fixed with a strap muscle flap and surgery concluded uneventfully. Following deep extubation, an air leak at the surgical site was noted. The patient was reintubated, the incision was re-opened and the tracheal flap was revised to prevent tracheal leaking.



## Discussion:

From the very beginning of ether anesthesia when Dr. William Morton anesthetized a patient undergoing resection of a vascular tumor from the patient's neck, the practice of anesthesia has been intricately involved with head and neck surgery. These procedures require particular attention to airway management during intubation and extubation. Difficult intubation complicates 7-9 percent of H&N cases, 2-4 times higher than mixed surgical populations. Factors predicting difficult intubation in H&N surgery include history of radiation, abnormal neck anatomy and airway masses. Additionally, a history of radiation potentially complicates a surgical approach to the difficult airway.

This case demonstrated a unique and unexpected complication during extubation. Other examples of extubation complications include patient related issues (subglottic stenosis or edema) causing physical obstruction to removal of the ETT, surgical related issues (unintentionally suturing to ETT, and anesthesia related issues (incomplete deflation of ETT cuff).

### Differential Diagnosis for Thyroid Cancer

- Papillary Carcinoma- most common (80%); slow growing, differentiated, develops from follicular cells, lymph node spread. Can involve multiple lobes, good prognosis
- Follicular Carcinoma- 2<sup>nd</sup> most common (10%); inadequate dietary intake of iodine. More aggressive, more metastasis
- Medullary Thyroid Carcinoma- (4%) C. Cells (calcitonin), more aggressive, less differentiated. More likely to spread
- Anaplastic Carcinoma- (4%) Undifferentiated, rapid spread. Median survival 3-7 months

### Post Thyroidectomy Complications

- Early:
  - Hemorrhage/Hematoma
  - Recurrent Laryngeal Nerve injury
- Respiratory Obstruction
- Bilateral RLN vs hematoma
- Late
  - Respiratory Obstruction
  - Hypocalcemia
  - Infection
  - Thyroid/Parathyroid insufficiency

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## Anesthetic Management:

In any case involving head and neck tumors, detailed knowledge to include imaging of the tumor is important for assessing a potential difficult airway preoperatively. Depending on the clinical circumstances and size of the mass, DL and intubation may be unsuccessful. Management of the airway should continue according to the ASA Difficult Airway Algorithm while additional resources are acquired for repeat intubation attempts. The presence of potential airway obstruction should be discussed with the surgical providers and, if applicable, preparation made for surgical airway.

Following completion of the case, there should be careful consideration regarding the criteria for extubation, starting with the decision for an awake extubation versus extubation before return of consciousness. ASA guidelines also recommend possible placement of a short-term conduit or bougie to aid reintubation, if necessary. Identification of the airway leak was obvious in this case. In other less obvious cases, close communication with the surgical team may be necessary to quickly identify and treat an airway issue on extubation.

## References:

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