Complex Airway Management in Oral and Maxillofacial Surgery and Head and Neck Practices

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Topics:

- Traditional Intubation Techniques
- Alternative Intubation Techniques
- Awake tracheostomy
- Cases
Indications for intubation:

- Respiratory distress
- Impending airway compromise
- Changes in mentation
- Loss of protective reflexes
- Surgical procedures of the oral cavity requiring a definitive airway

Standard Intubation Techniques:

- Direct laryngoscopy
- Indirect laryngoscopy: CMAC, Glidescope
- Bougie
Non-Conventional/Alternative Intubation techniques:

- Awake intubation (oral or nasal) over flexible fiberoptic scope +/- video assisted indirect laryngoscopy (CMAC, etc.) vs direct
- Intubation over rigid laryngoscope/bronchoscope

Bougie technique

- Indications: anterior airway, difficult to visualize with direct laryngoscopy.
- Can confirm placement of bougie by tactile feel of the tracheal rings, then pass endotracheal tube over the bougie
Awake intubation over flexible fiberoptic scope

- Indications:
  - For difficult airways with deviations vs mass effect causing distortion
  - Limited optical window
  - If using the flexible fiberoptic scope, can combine with the Glidescope/CMAC to increase the optical window and assist in visualization of the pathway of the fiberoptic scope.
- Contraindications:
  - Severe obstruction, unable to pass the fiberoptic scope passed the vocal folds

Intubation over rigid laryngoscope/bronchoscope

- Indications: Supraglottic obstruction/mass, anterior airways
- Useful when already performing DL
- Contraindications: Unable to secure airway via supraglottic approach
What if a supraglottic approach is unlikely or impossible?

**Awake tracheostomy**

- **Indication:** Significant supraglottic obstruction where a direct supraglottic approach to the airway is difficult or impossible
- **Steps:**
  - Injection of local anesthetic to surgical site
  - Surgical procedure is performed +/- light sedation by anesthesia
Case 1: SB

Patient: SB

- 58 yo F presented to our clinic with a progressing lingual lesion
- Over the course of around 6 months had worsening induration to the anterior 1/3 of her tongue with more and more generalized difficulty with pronunciation and discomfort, otherwise denies neurosensory deficits. Also reports some minor weight loss
- PMH: HTN
- PSH: Percutaneous pinning, oophorectomy
- Meds: Lisinopril
- Social Hx: Denies; NKDA
Physical Exam:

- 3x2 cm erythro-leukoplakia with ulceration along the ventral side of the anterior tongue, tethered to the FOM and indurated.
- Nasopharyngoscopy/biopsies:
  - Performed on 2/15/23
  - Patient unable to protrude tongue, difficult to visualize vallecula/base of tongue during procedure.

Pathology

- Incisional biopsies from 2/15 came back as invasive SCCa p16-
Radiographs
Plan:

- DL with biopsies; extraction of teeth 13, 14, 18, 31 (performed on 2/21/2023)

What would be your airway plan the day of the procedure?

Our airway management on 2/21/2023

- Awake intubation with ETT over flexible fiberoptic scope and assisted with CMAC
- Based on our nasopharyngoscopy, knew the base of tongue was affecting the epiglottis. Also knew the patient was unable to protrude her tongue forward
- Osteolytic changes noted in the hyoid and likely invasion in the thyroid cartilage
Case 2: AG
Patient: AG  30 yo M

- S/p ext of teeth 1 and 32 1 week prior at a correction facility. Noted right facial swelling and was taken to the hospital.
- PMH: Hepatitis C with unknown treatment course, otherwise denies
- On admission noted to have sepsis with HR>90, WBC 21.5, and febrile at max temperature of 38.8 C. Patient also noted to be thrombocytopenic at 42.0
- PSH: Denies
- No known drug allergies
- No known immunodeficiencies

Patient: AG  continued

- On scan patient was noted to have a right submandibular and masticator space infection. Patient was taken for I and D on 2/16/2023.
- However, on POD5 patient continued to have a WBC of 18 with not much clinical improvement and continued to be febrile.
- Patient was tolerating secretions at the time and maintaining SpO2. Patient did affirm continued right neck pain.
- Because of clinical presentation, decision was made for a repeat CT neck.
CT neck w/ contrast:
• Incision and drainage of bilateral deep neck space infections via transcervical approach (2/21/2023)

Plan

How would you manage his airway prior to the incision and drainage?
Our Airway Management on 2/21/2023

- Awake intubation with ETT over flexible fiberoptic scope and assisted with CMAC; Back up plan of transitioning to awake tracheostomy if unable to intubate
- Extensive airway deviation and retropharyngeal, parapharyngeal and pre-tracheal involvement extending into the superior mediastinum.
Case 3: FHU

Patient: FHU
74 yo M

- Patient referred for base of tongue mass noted on outside imaging. Patient with history of months of worsening dysphagia for which imaging was ordered after a swallow study performed. Patient stated he has also had changes in his voice during his workup. Barium swallow study confirmed dysphagia during early stages of swallowing. For this reason, further imaging was ordered. Patient also had noted significant weight loss since the onset of symptoms

- PMH: HTN
- Social Hx: 50 pack year hx of smoking cigarettes
- NKDA
Physical Exam:

• Slight hoarseness in voice during phonation
• Otherwise, unremarkable exam.
• Nasopharyngoscopy was performed at time of consult

Radiographs:
Plan

DL with biopsies, possible tracheostomy on 1/12/2023

What would be your plan for management of the airway during the procedure?
Our Airway Management on 1/12/2023:

- Patient was intubated with CMAC and stilleted ETT at the beginning of the case without complications (fiberoptic and bougey were available). Tray was also available for surgical standby.
- Attempted extubating at the conclusion of the case. However, patient was obstructing and in respiratory distress. Decision was made to reintubate for an open tracheostomy to be performed.
- Patient was re-intubated with ETT over the rigid laryngoscope. We were then able to then transition to a tracheostomy.
Case 4: BP

Patient: BP 73 yo M

- Consulted for patient with chronic respiratory failure with exacerbation (88% on RA), found on CT neck w/ contrast to have a supraglottic mass.
- PMH: CHF- EF 35-40%, Prostate carcinoma s/p radiation in 2018, COPD, CVA Hx
- Social: Smoking and EtOH currently
- Med: Hydralazine, Losartan, Aldosterone, Prednisone, Albuterol, DuoNeb, Ativan, Gabapentin
Physical Exam:

<table>
<thead>
<tr>
<th>General:</th>
<th>AAO x 3 and NAD glasgow coma scale 15; frail appearing</th>
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<tbody>
<tr>
<td>Head:</td>
<td>normocephalic/atraumatic</td>
</tr>
<tr>
<td>Eyes:</td>
<td>PERRL; conjunctivae and sclerae normal; pupils equal, round; globes soft to touch</td>
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<tr>
<td>Ears:</td>
<td>External auditory canal(s): clear with no otorrhea</td>
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<tr>
<td>Nose:</td>
<td>no nasal deformity appreciated and nares patent bilaterally; septum midline no intranasal mass appreciated</td>
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<tr>
<td>Oral Cavity/Pharynx:</td>
<td>Poor dentition partial edentulism. MP 1; TS 1; Tongue FORM; no intraoral masses or pigmentation. No intraoral ulcerations. FOM soft. Non elevated. Uvula midline.</td>
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<tr>
<td>Neck:</td>
<td>Soft and supple; no LAD appreciated</td>
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<tr>
<td>Neuro:</td>
<td>CN V and VII intact b/l</td>
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Radiographs:
Radiographs Continued:

Plan

- DL with biopsies, tracheostomy on 12/1/2022

What would be your plan for airway management?
Our Airway Management on 12/1/2022

Awake tracheostomy performed with DL with biopsies. It was noted during the DL intraoperatively that the large supraglottic mass was severely occluding the airway. Unable to visualize the arytenoids or the vocal folds.

Decision was made to perform awake tracheostomy due to severity of supraglottic obstruction- it was unlikely that we would be able to intubate via oral or nasal

Biopsies came back + for SCCa and patient is now s/p total laryngectomy, total thyroidectomy, partial pharyngectomy, b/l neck dissections and reconstruction with ALT flap.

Intraoperative Photos:

• Photo 1: Significant obstruction of larynx- likely impossible to perform supraglottic intubation
• Photo 2- Laryngectomy and pharyngectomy with ALT free flap reconstruction