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National Guard Health Affairs - KAMC
Introduction

- 1.7% of all cancer in male in KSA **
- Laryngeal cancer affects nearly 12,720 men and women
- 3,600 people will die of laryngeal cancer in the United States per year
- Geographic variations in the incidence and mortality of laryngeal cancer suggest that a larger proportion of the cases occur in South-Central Asia, Eastern Asia, Central Europe, and Eastern Europe
- Men are more commonly affected than women (3.6 : 1)
- This ratio has decreased over the years likely secondary to the increased rate of tobacco use in females

**National tumor registry report, 2013**
Introduction

- Over 40% of laryngeal cancers present with advanced-stage disease
- The larynx is the second most common site of primary epithelial malignant tumors of the head and neck.
- Laryngeal cancer accounts for 0.3% of all cancer-related deaths
Glottis 51%
Subglottis 2%
Supraglottis 32%
Laryngeal Cartilage 1%
Larynx NOS 9%
Overlapping lesion of larynx 4%
95% of primary laryngeal cancers and arise from the stratified squamous epithelium lining the larynx (dysplasia, CIS, SCC)

Others:
- Verrucous squamous cell carcinoma (a highly differentiated variant with low incidence for metastases),
- Adenocarcinoma,
- Spindle cell carcinoma,
- Fibrosarcoma,
- Chondrosarcoma.
- Neuroendocrine tumors, though rare, are the most common nonsquamous tumors encountered and have a predilection for the supraglottic larynx
Pathological changes start at basement membrane
- Mitoses count per hpf, high NC ratio, large nucleoli
- Dysplasia
  - Mild, moderate, severe
- CIS (whole thickness)
  - 29% of CIS ----- SCC
- Microinvasive --- basement membrane
- Invasive --- TA muscle
Cancer of the larynx is strongly related to cigarette smoking.
  - The risk decline among ex-smokers after 5 years
  - Reach Nonsmokers after 10 years of abstention.

Role of alcohol in inducing laryngeal cancer remains still unclear
About 5% of laryngeal cancers occur in nonsmokers and nondrinkers, suggesting that other factors:

- Diet,
- Gastroesophageal reflux,
- Previous radiation,
- Viral infection
  - Human papillomavirus (16 & 18) in 5% to 32% of analyzed samples in laryngeal cancer
- Occupational exposures to wood dust, polycyclic hydrocarbons, and asbestos
Supraglottis

- Extends from the epiglottis to the ventricular apices.
- Contents:
  - False cords,
  - Aryepiglottic folds,
  - Arytenoids,
  - Laryngeal surface of the epiglottis
- Epithelial lining: ciliated columnar epithelium
- Malignancy: 32%

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- Extends: from the ventricle between the true and false cords to 0.5 cm below the free edge of the true cords

- Contents:
  True vocal cords,
  Anterior commissure,
  Interarytenoid region

- Epithelial lining: Stratified squamous epithelium
  - Malignancy: 51 %
Subglottis

- Extends: from lower border of the glottis to the lower border of the cricoid cartilage.
- Epithelial lining: ciliated columnar epithelium
- Malignancy: 2%
Epithelium: Stratified squamous.

LP: The superficial layer:
- Loose fibrous tissue
- Rarely lymphatics
- Resistance to the spread of early glottic tumors

Vocalis:
- Tumor invasion: Vocal cord immobility
1- Quadrangular membrane
2- Conus elasticus
3- Cricothyroid membrane
4- Thyrohyoid membrane
5- Inner perichondrium
**Laryngeal spaces**

1- Pre epiglottic space
2- Paraglottic space
3- Broyle’s tendon: vocalis tendon insertion into thyroid cartilage
   ➢ Deficient perichondrium

**Allowing spread of laryngeal cancer**
**Planning of conservation surgical procedures.**
Pre epiglottic space

- Anterior: Thyrohyoid membrane, hyoid bone
- Posterior: epiglottis
- Inferior: attachment of epiglottis to thyroid cartilage
- Superior: hyoepiglottic ligament
- Lateral: in continuity of paraglottic space
Lateral: thyroid cartilage & cricothyroid membrane

Medially:
- Quadrangular membrane
- Conus elasticus

Posterior: piriform sinus

**Allow transglottic tumor, extension of tumor above and below the ventricle**
Supraglottis:
- Level II, III, IV

Glottis:
- non existent
- Subglottis
- Level IV, VI & VII

** contralateral drainage for midline lesion**
Larynx Cancer: Incidence of Neck Metastases by Site.

<table>
<thead>
<tr>
<th></th>
<th>T1</th>
<th>T2</th>
<th>T3</th>
<th>T4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supraglottic</td>
<td>40-15 %</td>
<td>25-40 %</td>
<td>50-60 %</td>
<td>65%</td>
</tr>
<tr>
<td>Glottic</td>
<td>&lt; 5 %</td>
<td>5 – 10 %</td>
<td>10-20 %</td>
<td>20-40 %</td>
</tr>
</tbody>
</table>

Incidence of occult metastasis > 20 % ------ treatment of the neck
- Supraglottis
  Superior laryngeal artery, (STA)

- The lower half of the larynx:
  Inferior laryngeal artery (ITA)
**Physiology**

- Airway protection
- Respiration
- Phonation
- Swallowing

**Effects on this complex mechanism must be taken into account when formulating a treatment plan.**
Work up

- History
- Physical examination,
- Fiberoptic laryngoscopy
- Imaging
- Direct laryngoscopy under anesthesia for biopsy and assessment of secondary neoplasm
History

- Dysphagia
- Vocal changes ---- glottic
- Stridor ---- glottic / subglottic
- Aspiration
- Otalgia
- Blood-tinged sputum ---- supraglottic
- Neck mass
- Cachexia
- Dyspnea
- Pain
- Halitosis
Past medical history:
- Assessing patient comorbidities,
- History of cancer,
- Immunologic status.
- Treatment preferences

Social history:
- Synergistic effect when tobacco is combined with alcohol
- Delirium tremen
- Tobacco withdrawal

Occupation:
- Risk factors: metal workers, construction workers (asbestos), and textile processors.
- Treatment preferences: Professional voice user
Airway distress, mandate urgent airway protection

Neck exam:
- Lymphadenopathy
- Fixed larynx: advanced laryngeal tumor

Laryngeal endoscopy:
- Extension of the lesion
- Vocal cords mobility
- Airway patency
- Second primary tumors ---- 9 %
CT head, neck, larynx with contrast
MRI head & neck
Chest xray
PET/CT scan
- Standard imaging modality for advanced laryngeal cancers
- Specific for cartilage invasion
Identification of subtle extralaryngeal spread or early cartilage destruction.
Preoperative assessment:
- Chronic pulmonary disease

Evaluation and staging of laryngeal cancer:
- Synchronous or metastatic lung mass/tumor.

Abnormalities on chest x-ray: CT chest
Standard assessment of regional cervical metastasis
- Sensitivity 84%
- Specificity 100%
- Nodes measuring < 5 mm were not detected

Assessment of distant metastasis.
- Sensitivity 86%
- Specificity 84%

Evaluation of loco regional recurrence.
- complete blood count,
- Coagulation studies,
- Liver function tests and calcium and alkaline phosphatase
  - High level ---- CT abdomen, bone scan or PET
Table 3: American Joint Committee on Cancer (AJCC) TNM Staging System for the Larynx (7th ed., 2010)

Nonphotosensitive tumors such as those of lymphoid tissue, soft tissue, bone, and cartilage are not included.

<table>
<thead>
<tr>
<th>Primary Tumor (T)</th>
<th>Glottis</th>
<th>Supraglottis</th>
<th>Subglottis</th>
</tr>
</thead>
<tbody>
<tr>
<td>TX</td>
<td>T1</td>
<td>T1</td>
<td>T1</td>
</tr>
<tr>
<td>T0</td>
<td>T1a</td>
<td>T1b</td>
<td>T1</td>
</tr>
<tr>
<td>Carcinoma In situ</td>
<td>T2</td>
<td>T2</td>
<td>T2</td>
</tr>
<tr>
<td>T1</td>
<td>T3</td>
<td>T4a</td>
<td></td>
</tr>
<tr>
<td>T2</td>
<td>T4b</td>
<td></td>
<td>T4b</td>
</tr>
<tr>
<td>T3</td>
<td>T4a</td>
<td></td>
<td>T4b</td>
</tr>
<tr>
<td>T4a</td>
<td></td>
<td></td>
<td>T4b</td>
</tr>
<tr>
<td>T4b</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Tumor invades through the outer cortex of the thyroid cartilage and/or invades tissues beyond the larynx (eg, trachea, soft tissues of neck including deep extrinsic muscles of the tongue, strap muscles, thyroid, or esophagus)**
# AJCC staging 2013

## NCCN Guidelines Version 2.2013 Staging Head and Neck Cancers

### Table 3 - continued

**American Joint Committee on Cancer (AJCC)**  
**TNM Staging System for the Larynx** (7th ed., 2010)  
(Nonpithelial tumors such as those of lymphoid tissue, soft tissue, bone, and cartilage are not included)

#### Regional Lymph Nodes (N)*

<table>
<thead>
<tr>
<th>Stage</th>
<th>Anatomic Stage/Prognostic Groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>T0</td>
<td>Tis N0 M0</td>
</tr>
<tr>
<td>T1</td>
<td>T1 N0 M0</td>
</tr>
<tr>
<td>T2</td>
<td>T2 N0 M0</td>
</tr>
<tr>
<td>T3</td>
<td>T3 N0 M0</td>
</tr>
<tr>
<td>T4a</td>
<td>T4a N0 M0</td>
</tr>
<tr>
<td>T4b</td>
<td>T4b N2 M0</td>
</tr>
<tr>
<td>T4c</td>
<td>T4c N3 M0</td>
</tr>
</tbody>
</table>

*Note: Metastases at level VII are considered regional lymph node metastases.

#### Distant Metastasis (M)

<table>
<thead>
<tr>
<th>Stage</th>
<th>Anatomic Stage/Prognostic Groups</th>
</tr>
</thead>
<tbody>
<tr>
<td>M0</td>
<td>No distant metastasis</td>
</tr>
<tr>
<td>M1</td>
<td>Distal metastasis</td>
</tr>
</tbody>
</table>

### Histologic Grade (G)

<table>
<thead>
<tr>
<th>Grade</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>G1</td>
<td>Well differentiated</td>
</tr>
<tr>
<td>G2</td>
<td>Moderately differentiated</td>
</tr>
<tr>
<td>G3</td>
<td>Poorly differentiated</td>
</tr>
<tr>
<td>G4</td>
<td>Undifferentiated</td>
</tr>
</tbody>
</table>

**Discussion**
Multidisciplinary team approach

- Surgeon
- Radiation oncologist
- Medical oncologist
- Speech pathologist
- Dental
- Nutritionist
- Psychosocial evaluation

** Ultimate goal : cure from cancer
** Secondary goal : preservation of function
Pan endoscopy & examination under anesthesia:
- Assessment of the boundaries of the primary site (T stage)
- Candidacy for conservation laryngeal surgery
- Assessment of adequate exposure for endoscopic laser resection.
- Evaluation of a second primary tumor:
  - Oropharynx
  - Hypopharynx
  - Larynx
  - Esophagus
  - Trachea & bronchi

Secure the airway if needed:
- Awake fiberoptic intubation
- Awake tracheostomy
Pulmonary function test:

- Crucial planning for conservative surgery
- FEV1 >75% or FEV1 /FVC < 65% ---- Increase risk of aspiration
Early stages (T1, T2)
Single modality
- Surgery (Endoscopic/open) or
- External beam radiation therapy
Observation or
Neck dissection or
Radiation therapy

** supraglottic  bilateral level II, III & IV

** If radiation is the treatment option, the field can be extended to include the nodal basins at risk.
** If surgery is the best treatment option, a selective neck dissection can be performed with limited morbidity
Modified radical Neck dissection & post op XRT

*Bilateral neck dissection for midline lesion or advanced T stage
Management premalignant lesion

- Smoking cessation
- Eliminate risk factor, LPR
- Observation for mild dysplasia
- Stripping / microlaryngoscopy and excision with/out CO2 laser
- RT (radiation therapy)
- Follow up with outpatient laryngoscopy
Management
Early supraglottic SCC T1,T2 & N0

- Primary surgery or definitive radiotherapy (RT)

- Surgery:
  - Primary:
    - Endoscopic resection: TLM (transoral laser microsurgery) or TORS
    - Open procedure: horizontal supraglottic or supracricoid laryngectomy
  - Neck:
    - Occult metastatic rate ranging from 4% to 35%
    - Bilateral neck dissection vs RT
TLM VS horizontal supraglottic laryngectomy:

- Less resection of normal structures in TLM
- Knowledge of site-specific “inside out” anatomy
Endoscopic management of supraglottic cancer dates back to 1939.

The basic technique of transtumoral cuts to assess the depth of disease.

Multibloc transoral laser resection is distinct from the time honored principle of en bloc tumor resection.
The fundamental requirements:

- Careful training in the technique,
- Knowledge of site-specific “inside out” anatomy,
- Good endoscopic access,
- Strict enforcement of laser-specific precautions in the operating room.
Limitations of endoscopic access:

- Teeth (prominent),
- Trismus,
- Transverse dimensions (narrow mandibular arch),
- Tori (mandibular),
- Tongue (bulk),
- Tilt (atlanto-occipital extension),
- Treatment (prior radio- or chemoradiotherapy),
- Tumor (site and size).
Intraoperative involvement of the following:

- Preepiglottic
- Paraglottic space,
- Bilateral arytenoid,
- Thyroid cartilage.
**Supraglottic laryngectomy**

- **Indication**
  - T1, T2, or T3 supraglottic tumors with limited preepiglottic space involvement.

- **Requirement:**
  - Mobile vocal cords,
  - Cartilage involvement: none
  - Limited base of tongue extension,
  - Pyriform sinus involvement: none
  - Good pulmonary reserve
## Early supraglottic SCC functional outcomes

<table>
<thead>
<tr>
<th></th>
<th>TLM</th>
<th>Open procedures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Swallowing</td>
<td>Better</td>
<td>Worse</td>
</tr>
<tr>
<td>Need of Nasogastric tube</td>
<td>Rare</td>
<td>Common</td>
</tr>
<tr>
<td>Speech</td>
<td>Better</td>
<td>Worse</td>
</tr>
<tr>
<td>Need of tracheostomy</td>
<td>none</td>
<td>common</td>
</tr>
<tr>
<td>Aspiration</td>
<td>Less likely</td>
<td>Common 40 %</td>
</tr>
<tr>
<td>Hospitalization</td>
<td>Short / day surgery</td>
<td>Longer</td>
</tr>
<tr>
<td>Surgical complication</td>
<td>None</td>
<td>Less common</td>
</tr>
<tr>
<td>Pharyngecutaneous fistula, wound dehiscence</td>
<td>None</td>
<td>Less common</td>
</tr>
</tbody>
</table>
# Early supraglottic SCC Oncological outcomes

<table>
<thead>
<tr>
<th></th>
<th>TLM</th>
<th>Open procedures</th>
</tr>
</thead>
<tbody>
<tr>
<td>5-year disease-free survival</td>
<td>80%</td>
<td>72%</td>
</tr>
<tr>
<td>5-year laryngeal preservation rate</td>
<td>86%</td>
<td>80%</td>
</tr>
<tr>
<td>5-year disease-specific survival</td>
<td>89%</td>
<td>80%</td>
</tr>
</tbody>
</table>
The success is often correlated with the tumor volume.

In the era of endoscopic approaches to early supraglottic tumors:
- RT is indicated for treatment of patients who are not physiologically suitable for conservation surgery.

Local control rates:
- T1: (75 - 100%)
- T2: (71 - 83%)
- Laryngeal preservation rate of about 80%
Management
Early glottic SCC T1,2 & N0

- Primary surgery or definitive radiotherapy (RT)

- Surgery
  - Primary:
    - Endoscopic resection: TLM
    - Open procedures: Laryngofissure, Vertical partial laryngectomy & supracricoid laryngectomy.
  - Neck:
    - Occult metastasis < 10%
The basic technique of transtumoral cuts to assess the depth of disease.

Multibloc transoral laser resection is distinct from the time honored principle of en bloc tumor resection.
The concept of endoscopic excision of early glottic cancer was pioneered by Lynch in 1920.

The procedure being popularized with CO2 laser, later by Steiner in 1980s.
Subglottic extension (≥5 mm)
Postcricoid extension
Invasion of the piriform sinus
Cartilage invasion
Vocal fold fixation (relative)
Arytenoid extension (relative)
Involvement of the base of the tongue
# Early glottic SCC

## TLM VS RT, Functional outcome

<table>
<thead>
<tr>
<th></th>
<th>TLM</th>
<th>RT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voice handicap index</td>
<td>Mildly affected</td>
<td>Accepted quality</td>
</tr>
<tr>
<td>Age</td>
<td>Younger</td>
<td>Old</td>
</tr>
<tr>
<td>Duration &amp; Cost</td>
<td>Day procedure, less cost</td>
<td>5-7 weeks, expensive</td>
</tr>
<tr>
<td>High risk anesthesia</td>
<td>Avoided</td>
<td>Better option</td>
</tr>
<tr>
<td>Sub sites/extension</td>
<td>T1a +/-1 anterior commissure</td>
<td>T1b or anterior commissure</td>
</tr>
</tbody>
</table>
## Early glottic SCC surgical management, oncological outcome

<table>
<thead>
<tr>
<th></th>
<th>TML</th>
<th>RT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local control %</td>
<td>89</td>
<td>75</td>
</tr>
<tr>
<td>Laryngeal preservation %</td>
<td>100</td>
<td>83</td>
</tr>
</tbody>
</table>
## Early glottic SCC
### Surgical management: functional outcome

<table>
<thead>
<tr>
<th></th>
<th>TML</th>
<th>Open procedures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospitalization</td>
<td>Day surgery</td>
<td>longer, minimum 7 days</td>
</tr>
<tr>
<td>Need of tracheostomy</td>
<td>None</td>
<td>Common</td>
</tr>
<tr>
<td>Voice handicap index</td>
<td>Severely affected</td>
<td>Severely affected</td>
</tr>
<tr>
<td>Swallowing</td>
<td>Normal</td>
<td>, +/- dysphagia (NGT)</td>
</tr>
<tr>
<td>Aspiration</td>
<td>Rare</td>
<td>Common</td>
</tr>
<tr>
<td>Salvage after recurrence</td>
<td>Smooth</td>
<td>Difficult</td>
</tr>
</tbody>
</table>
Early glottis SCC
Open procedures

1- Laryngofissure & cordectomy
2- Hemilaryngectomy

- Tracheostomy & Nasogastric tube feeding are a must in most cases
Advanced laryngeal CA
The goal of treatment is **cure**
Secondary goals of preserving **speech and swallowing function**.
The patient should be included in all aspects of the decision-making process and be allowed to make an informed decision on which treatment option is best for him or her.
Advanced stages (T3, T4), N2 & N3
Multimodality approach:
- Radio chemotherapy (organ preservation approach) or
- Surgery & post operative EBRT +/- chemotherapy
Primary therapy
Post operative adjuvant therapy
Palliative therapy.
The goal of radiation therapy is to achieve better outcomes with tumor eradication while preserving normal tissue. The typical total treatment dose of radiation is 60 - 70 Gy given 5 days per week over a period of 6 to 7 weeks.

Indication:
- Primary: T3
- Neck: N+ or occult nodal metastasis > 20%
- Palliation in unresectable tumors & poor surgical candidates
Post operative radiation therapy

- Adjuvant radiation be given in the postoperative period (after laryngectomy)

- **Indications**:
  
  **A. Primary tumor:**
  - Advanced stage disease
  - Subglottic extension of tumor.
  - Positive margins
  - Perineural spread
  - Angiolympathic spread of tumor

  **B. Lymph node:**
  - Multiple involvement
  - Extracapsular spread
Primary therapy in conjunction with RT
Post operative adjuvant therapy in conjunction with RT
Palliative therapy.
Almost always in conjunction with RT

Methods of chemotherapy delivery:
- Induction
- Concomitant

Cisplatin and 5-fluorouracil are the two most commonly used agents.

Main usage as:
- Radiosensitizer
- Systemic antineoplastic effect

Distant metastases appear to be decreased with chemotherapy
Pivotal in establishing the role of non-surgical methods of treatment for advanced laryngeal cancers.

Inception of organ preservation strategies took seed in the early 80s with initial trials demonstrating the potential of chemotherapy to cause tumor regression as well as predict response to RT.

Provide a landmark induction study for laryngeal cancer.
Advanced laryngeal CA
Stage III & IV ad

2 cycle chemo

Partial response

3rd cycle chemo & RT

3rd cycle chemo & RT

Poor response

Total laryngectomy & PORT
Patients treated with induction chemotherapy followed by radiation had a similar survival to those treated with total laryngectomy and postoperative radiation.

This approach was able to achieve larynx preservation in 64% maintaining similar overall survival in both arms.
The key to the surgical treatment of laryngeal cancer is to determine the correct patient for the correct procedure while accounting for the expertise of the surgeon.
Surgical treatment

- Trans oral laser resection
  - Seldom for bulky T3 or T4

- Open conservative laryngeal approaches
  - Vertical Hemilaryngectomy
  - Supraglottic (horizontal) laryngectomy
  - Supracricoid laryngectomy

- Total laryngectomy
Open conservative laryngectomy

- Procedures that maintain **physiologic speech** and **swallowing** without the need for permanent tracheostoma

- Goal:
  - maximal laryngeal function without compromising cure rate
  - Preservation of swallowing, respiration, phonation, and airway protection.
  - **Proper patient selection is critical.**

- One cricoarytenoid joint is preserved and one laryngeal valve (epiglottis, false vocal cords, or true vocal cords) is mandatory to be maintained.
Vertical hemilaryngectomy

- It is an organ-sparing procedure used for the treatment of **glottic malignancies**

- **Indication**:
  - Selected T3
  - Seldom in T4

- **Trachestomy is mandatory**

- **Contraindactions**:
  - Fixed true vocal fold,
  - Posterior commissure/interarytenoid involvement,
  - Invasion of bilateral arytenoids,
  - Bulky transglottic lesion,
  - Thyroid cartilage invasion,
  - Preepiglottic space involvement,
  - Subglottic extension that involves the cricoid cartilage,
  - Extralaryngeal spread
  - Poor pulmonary reserve.
Figure 31-8. Schematic of the anatomic resection for a vertical hemilaryngectomy. (Modified and reprinted, with permission, from Myers EN, Suen JY. Cancer of the Head and Neck, 3rd ed. WB Saunders, 1996.)
Horizontal laryngectomy

- It is an organ-sparing procedure used for the treatment of supraglottic malignancies.
- Indication:
  - T3 with limited preepglottic involvement.
- Tracheostomy is mandatory.
- Contraindication:
  - Thyroid cartilage invasion,
  - Vocal cord fixation
  - Involvement of Anterior commissure, posterior commissure, the pyriform apex, postcricoid mucosa base of tongue & bilateral arytenoids.
  - Poor pulmonary reserve
Horizontal laryngectomy
Figure 31-10. Schematic of the anatomic resection for a supraglottic laryngectomy. (Modified and reprinted, with permission, from Myers EN, Suen JY. Cancer of the Head and Neck, 3rd ed. WB Saunders, 1996.)
This technique adds to the previous supraglottic laryngectomy to remove the **supraglottis** plus **the true vocal cords and thyroid cartilage**.

- Trachestomy is mandatory.

- **Indications:**
  - **Supraglottic or glottic cancer**
    - Anterior commissure involvement
    - Ventricle invasion
    - Minimal thyroid cartilage invasion
    - True vocal cord immobility
    - Paraglottic and moderate preepiglottic space involvement
    - Transglottic tumors
Supracricoid laryngectomy

- Cricoid
- Hyoid preserved.
- One arytenoid

** poor pulmonary reserve is contraindication.
Figure 31-12. Schematic of the anatomic resection for a supracricoid laryngectomy. (Modified and reprinted, with permission, from Myers EN, Suen JY: Cancer of the Head and Neck, 3rd ed. WB Saunders, 1996.)
Supracricoid laryngectomy reconstruction

CHP (epiglottis resected)

CHEP
Total laryngectomy

- Gold standard treatment for laryngeal cancer and has the best oncologic outcome for which all partial laryngectomies should strive to achieve.

- Indication
  - T4 & selected T3 cancers,
  - CCRT failures
  - Conservation laryngeal surgery failures

- Advantage: excellent control rate

- Disadvantage: sacrifice natural voice
An en bloc resection of all the following:

- larynx,
- Hyoid bone,
- Thyroid cartilage,
- Cricoid cartilage Proximal tracheal rings inferiorly
Total laryngectomy
pharyngeal closure

Specimen removed and nasogastric tube placed

T-shaped closure with 3-0 polyglactin sutures

Inverting, interrupted suture technique
The trachea is sutured to the skin to form a tracheostoma.

Avoidance of stomal stenosis is key for best voice restoration procedure.
- T4 tumors of the glottis
  - 5-year overall survival: 32% to 63%
  - The overall recurrence rate for Stage III and IV glottic: 37%
  - 19% recurring at the primary site & 17% recurring in the neck
Salvage total laryngectomy

- **Indication:**
  - Failure of organ preservation therapy with chemoradiation therapy
  - Fails conservation laryngeal surgery

- **Overall survival:**
  - 5 years ----- 65%
  - 10 years ---- 37%

**Higher surgical complication rate, pharyngocuternous fistula (30%).**, carotid blow out.
Surveillance

- 4 to 8 weeks for 1st 2 years,
- 3 months for the third year,
- 6 months for years 4 and 5,
- Annually for life

- Physical examination, outpatient laryngoscopy
- Annual chest radiograph
- Annul TSH
Hoarseness

**Pain**, even if there is no obvious tumor.

Fixation of a previously mobile vocal cord, persistent edema.

PET/CT scan is key diagnostic test Post therapy

Generous deep biopsies are required, if recurrence is suspected.
Recurrence laryngeal SCC management

- **RT failure:**
  - Cordectomy, or
  - Hemilaryngectomy, or
  - Total laryngectomy

- **Surgery (conservative) failure**
  - Low volume ---- RT
  - High volume ---- total laryngectomy
## Prognosis (overall 5 year survival)

<table>
<thead>
<tr>
<th>Stage</th>
<th>Glottis %</th>
<th>Supraglottis %</th>
<th>Subglottis %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage III</td>
<td>55</td>
<td>55</td>
<td>40</td>
</tr>
<tr>
<td>Stage IV</td>
<td>22-52</td>
<td>28 -35</td>
<td>25%</td>
</tr>
</tbody>
</table>
Case 1

- A 45-year-old woman with a 4-month history of hoarseness that has not improved on antibiotics. She does note that her mother underwent chemoradiation for a lung cancer and she wishes to avoid radiation at all costs.
Professionals:
Social habits: 25 pack-year history of smoking:
Sociofinancial status:
Pulmonary function status
Neck: no LAP

Flexible fiberoptic examination reveals:

- 1.5-cm mass involving the whole length of left true vocal cords. Both vocal cords demonstrated normal motion with both arytenoids appearing normal as well.
CT neck, larynx with contrast
Chest x-ray
Panendcoscopy & biopsy: SCC
PFT
What is the stage?
- T1aN0 glottic SCC
- What is the recommended treatment?
  - TLM
  - Vertical partial laryngectomy
- Does she need neck dissection?
- What is the follow up rational?
Case 2

- The patient is a 45-year-old man with a 4-month history of hoarseness. He is a 25 pack-year smoker. He is currently self-employed as a trial lawyer.
Neck; No LAP
Laryngeal crepitus: preserved
Flexible fiberoptic laryngoscopy:

What is the next step in diagnosis?
- CT neck, larynx with contrast
- Chest X-ray
- +/- PET scan
- PFTs
- What is the next step?
MRI neck: Thyroid cartilage preserved.

What is the next step?
Panendoscopy & biopsy: no subglottic extension and spares both of the arytenoid complexes.

Pathology: SCC

What is the stage?
- Supraglottic SCC, T3N0M0
- What is the recommended management?
Multimodality treatment:

CCRT (Primary & bilateral neck level II, III & IV)

- Primary: 70 Gy
- Neck: 56-60 Gy

Surgery & PORT

- Supracricoid laryngectomy, CHP or
- Total laryngectomy
- Bilateral neck dissection level II, III & IV
Thank you