Laryngeal Cancer

Dr Jeeve Kanagalingam
TTSH
Overview

- History
- Epidemiology
- Biology
- Assessment
- TNM
- Treatment
  - Early stage disease
  - Advanced disease
- Voice restoration
Treatment of laryngeal cancer

Patrick Watson in Edinburgh did first laryngectomy in 1866 for syphilis. Pt died after 8 weeks.

Billroth in 1873 performed first for cancer. Pt survived 1 year.

First 103 cases, only 9 survived > 1 year.

Closure of pharynx and separation from trachea introduced by Langenbach.

Theodor Billroth (1829-1894)
Laryngectomy could have saved us a world war!
Laryngeal cancer in Singapore

- Incidence of 4.4 per 100,000 (1998-2002) down from 6.8 (1968-1972)
- 75 cases a year
- Male to female ratio 12.3:1
- 97.3% are SCC
- Ratio of glottic:supraglottic is 5:2
Smoking, alcohol and laryngeal cancer

- RR of laryngeal cancer between smokers and non-smokers is 15.5 in men, 12.4 in women
- Drinking 100g alcohol per day (7 standard drinks) confers an RR of 15
- Using an additive risk model, combined use increases risk by 50%

Figure 1–5. Relative risk of cancer for various head and neck sites relative to history of daily alcohol consumption adjusted for tobacco use. (Data from: Brugere J, Guenel P, Leclerc A, Rodriguez J. Differential effects of tobacco and alcohol in cancer of the larynx, pharynx and mouth. Cancer 1986;57:391–5.)
Figure 1–7. Graph demonstrating the odds ratio for exposure to alcohol and tobacco exposure in pharyngeal and laryngeal cancer patients. Odds ratio highest with heavy wine and black tobacco consumption. (Data from: Sancho-Garnier H, Theobald S. Black (air-cured) tobacco and blond (flue-cured) tobacco and cancer risk II: Pharynx and larynx cancer. Eur J Cancer 1993; 29A:273–6.)
Figure 8-2. A, Sagittal section of larynx demonstrating the preepiglottic and B, coronal section of larynx demonstrating the paraglottic space.
Assessment of the laryngeal cancer

- History, focus on symptoms of dysphonia, dyspnoea, stridor, dysphagia, aspiration, pain
- Office examination
  - Larynx / Pharynx
  - Neck
- Panendoscopy
- Imaging
Regions of the larynx

- **Supraglottis**
  - 5 parts: suprahypoid and infrahyoid epiglottis, aryepiglottic folds, arytenoids

- **Glottis**
  - True vocal cords, floor of ventricle and region 5 mm below true vocal cords or 1 cm below lateral border of ventricle
  - 3 parts: true cords, anterior commissure and ventricle

- **Subglottis**
  - Region beyond 5 mm below true vocal cords or 1 cm below lateral border of ventricle to lower border of cricoid ring
Transglottic carcinoma: term to describe the growth pattern of tumours that cross the laryngeal ventricle to involve both true and false vocal cords. Site of origin is uncertain.
### TABLE 5  T Staging for Tumors of the Larynx

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TX</td>
<td>Primary tumor cannot be assessed</td>
</tr>
<tr>
<td>T0</td>
<td>No evidence of primary tumor</td>
</tr>
<tr>
<td>Tis</td>
<td>Carcinoma in situ</td>
</tr>
<tr>
<td>Supraglottis</td>
<td></td>
</tr>
<tr>
<td>T1</td>
<td>Tumor limited to one subsite of supraglottis with normal vocal cord mobility</td>
</tr>
<tr>
<td>T2</td>
<td>Tumor invades mucosa of more than one adjacent subsite of supraglottis or glottis or region outside the supraglottis (eg, mucosa of base of tongue, vallecula, medial wall of pyriform sinus) without fixation of the larynx</td>
</tr>
<tr>
<td>T3</td>
<td>Tumor limited to larynx with vocal cord fixation and/or invades any of the following: postcricoid area, preepiglottic tissues, paraglottic space, and/or minor thyroid cartilage erosion (eg, inner cortex)</td>
</tr>
<tr>
<td>T4a</td>
<td>Tumor invades through the thyroid cartilage and/or invades tissues beyond the larynx (eg, trachea, soft tissues of neck including deep extrinsic muscle of the tongue, strap muscles, thyroid, or esophagus)</td>
</tr>
<tr>
<td>T4b</td>
<td>Tumor invades prevertebral space, encases carotid artery, or invades mediastinal structures</td>
</tr>
<tr>
<td>Glottis</td>
<td></td>
</tr>
<tr>
<td>T1</td>
<td>Tumor limited to the vocal cord(s) (may involve anterior or posterior commissure) with normal mobility</td>
</tr>
<tr>
<td>T1a</td>
<td>Tumor limited to one vocal cord</td>
</tr>
<tr>
<td>T1b</td>
<td>Tumor involves both vocal cords</td>
</tr>
<tr>
<td>T2</td>
<td>Tumor extends to supraglottis and/or subglottis, or with impaired vocal cord mobility</td>
</tr>
<tr>
<td>T3</td>
<td>Tumor limited to larynx with vocal cord fixation</td>
</tr>
<tr>
<td>T4a</td>
<td>Tumor invades cricoid or 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)</td>
</tr>
<tr>
<td>T4b</td>
<td>Tumor invades prevertebral space, encases carotid artery or invades mediastinal structures</td>
</tr>
<tr>
<td>Subglottis</td>
<td></td>
</tr>
<tr>
<td>T1</td>
<td>Tumor limited to the subglottis</td>
</tr>
<tr>
<td>T2</td>
<td>Tumor extends to vocal cord(s) with normal or impaired mobility</td>
</tr>
<tr>
<td>T3</td>
<td>Tumor limited to larynx with vocal cord fixation</td>
</tr>
<tr>
<td>T4a</td>
<td>Tumor invades cricoid or 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)</td>
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<td>T4b</td>
<td>Tumor invades prevertebral space, encases carotid artery, or involves mediastinal structures</td>
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</table>
Figure 8-4. Endoscopic view and assessment of a laryngeal cancer using the A-0°; B-30°; C-70°; D-120° telescopesc.
In the last 2 decades, 5-year survival of patients with laryngeal cancer has not changed dramatically...due to the lack of improvement in survival, significant efforts have been made to improve the quality of life in these patients. Paramount to this is preservation of a functional larynx.

Pioneering work on patient preferences showed that approximately 25% of healthy individuals interviewed were willing to trade a 20% absolute difference in survival for the opportunity to save their voice.

Anatomic preservation is not functional preservation!
Pre-malignant disease

Management of advanced premalignant laryngeal lesions
Felicia L. Johnson

Purpose of review
Laryngeal carcinogenesis is a multistep process with premalignant lesions progressing to invasive carcinoma over a period of years. The approach to these advanced premalignant lesions has always been early diagnosis and treatment to prevent further progression. Unfortunately, with the current means of diagnosis and a lack of consensus regarding treatment of these lesions, the incidence of advanced laryngeal malignancies continues to rise. The purpose of this article is to review the most recent contributions to the literature regarding diagnosis and management of advanced laryngeal premalignant lesions.

Recent findings
The current literature focuses on several new diagnostic techniques. These include the use of epidermal skin markers, which would allow for early diagnosis of premalignant lesions. Molecular approaches have also been developed, which include the use of epidermal growth factor (EGF) and its receptor levels, as well as the use of DNA markers associated with premalignant lesions.

Introduction
Laryngeal premalignant lesions include a wide spectrum of mucosal changes from simple hyperplasia or keratosis to carcinoma in situ (CIS). The World Health Organization classifies the various laryngeal precursor lesions into the following categories: hyperplasia, keratosis, mild, moderate or severe dysplasia, and CIS [1]. Unfortunately, there is no universally accepted histopathologic classification system and there is a lack of consensus regarding the diagnostic criteria for the various entities particularly in differentiating severe dysplasia from CIS. This results in poor reproducibility in the pathologic interpretation of these lesions and may have significant therapeutic implications.
Early stage disease

There are no randomized studies in which radiation therapy was compared with conservation surgery with respect to local control or survival for patients with limited-stage laryngeal cancer.

- T1–T2 disease should be treated with either radiation or larynx-preserving surgery
- Surgery should be with the aim of achieving clear margins
- Avoid combined modality therapy

- Selected stage III cases (e.g. T2 N+) are suitable for concurrent chemoradiotherapy
- Recurrence may be amenable to larynx-preserving surgery but majority of index T2 tumours will require laryngectomy
Larynx-preserving surgery

- Transoral Laser
- Vertical Partial Hemilaryngectomy
- Fronto-lateral Partial Hemilaryngectomy
- Supraglottic Laryngectomy
- Supracricoid Laryngectomy + CHP / CHEP
Transoral Laser Surgery

- Utilises Carbon Dioxide laser beam to resect tumour
- Offers a quick alternative to radiotherapy
- Is organ sparing
- Useful in managing laryngeal recurrence
Results of 333 cases of vocal cord carcinomas pT1a (1979 - 2001)

Tumor extent: more than 1/3 of the vocal cord: 68%; anterior commissure involvement: 22%; only midcordal lesion: 14%.

Complication rate: 1.2% (postoperative hemorrhage 2, edema 2; no tracheostomy, no feeding tube

Median follow-up: 72 months

Table 1: Oncologic Results of Laser Microsurgery for pT1a vocal cord carcinomas (n=333)

<table>
<thead>
<tr>
<th>Description</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 yrs Kaplan-Meier local control rate</td>
<td>96.2%</td>
</tr>
<tr>
<td>Larynx preservation rate</td>
<td>97.6%</td>
</tr>
<tr>
<td>5 yrs Kaplan-Meier disease-specific survival rate</td>
<td>100%</td>
</tr>
<tr>
<td>5 yrs Kaplan-Meier overall survival rate</td>
<td>86.8%</td>
</tr>
</tbody>
</table>
Results of 338 patients with pT2 and pT3 glottic cancer (1979 - 2001)

Stage Distribution:  
- stage II 71%, stage III 27%, stage IV 2%
Median follow-up: 69 months

Table 3: Therapy of Glottic Carcinomas (n=338)

<table>
<thead>
<tr>
<th>Treatment</th>
<th>pT2a (n=128)</th>
<th>pT2b (n=115)</th>
<th>pT3 (n=95)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laser</td>
<td>116 (91%)</td>
<td>87 (76%)</td>
<td>42 (44%)</td>
</tr>
<tr>
<td>Laser + ND</td>
<td>12</td>
<td>15</td>
<td>41</td>
</tr>
<tr>
<td>Laser + RT</td>
<td>-</td>
<td>11</td>
<td>3</td>
</tr>
<tr>
<td>Laser + ND + RT</td>
<td>-</td>
<td>2</td>
<td>9</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Survival Rate</th>
<th>pT2a (n=128)</th>
<th>pT2b (n=115)</th>
<th>pT3 (n=95)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 yrs Kaplan-Meier local control rate</td>
<td>85%</td>
<td>65%</td>
<td>68%</td>
</tr>
<tr>
<td>5 yrs Kaplan-Meier larynx preservation rate</td>
<td>96%</td>
<td>84%</td>
<td>80%</td>
</tr>
<tr>
<td>5 yrs Kaplan-Meier recurrence-free survival rate</td>
<td>82%</td>
<td>61%</td>
<td>60%</td>
</tr>
<tr>
<td>5 yrs Kaplan-Meier overall survival rate</td>
<td>75%</td>
<td>65%</td>
<td>58%</td>
</tr>
</tbody>
</table>
Supracricoid laryngectomy
Advanced stage disease

- All patients should be considered for laryngeal preservation
- No organ-preserving strategy offers a survival advantage over laryngectomy and suitable adjuvant therapy
- Selected T3 disease may be amenable to partial laryngeal surgery
- There is no role for induction chemotherapy prior to surgery outside a clinical trial
### Table 8–2. RESULTS OF CONVENTIONAL TREATMENT OF ADVANCED CARCINOMA OF THE LARYNX

<table>
<thead>
<tr>
<th>Author</th>
<th>Year</th>
<th>No.</th>
<th>Type of Therapy</th>
<th>Stage III/IV (%)</th>
<th>5 yr Survival (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kirchner(^{12})</td>
<td>1977</td>
<td>308</td>
<td>S/RT</td>
<td>100</td>
<td>54–56(^*)</td>
</tr>
<tr>
<td>Harwood(^{13})</td>
<td>1979</td>
<td>353</td>
<td>RT</td>
<td>54</td>
<td>70</td>
</tr>
<tr>
<td>Harwood(^{43})</td>
<td>1983</td>
<td>410</td>
<td>RT</td>
<td>66</td>
<td>57</td>
</tr>
<tr>
<td>Yuen(^{41})</td>
<td>1984</td>
<td>192</td>
<td>S</td>
<td>100</td>
<td>77</td>
</tr>
<tr>
<td></td>
<td></td>
<td>50</td>
<td>S/RT</td>
<td>100</td>
<td>91</td>
</tr>
<tr>
<td>Mendenhall(^{42})</td>
<td>1992</td>
<td>100</td>
<td>RT</td>
<td>100</td>
<td>74</td>
</tr>
<tr>
<td></td>
<td></td>
<td>65</td>
<td>S±RT</td>
<td>100</td>
<td>63</td>
</tr>
<tr>
<td>Nguyen(^{11})</td>
<td>1996</td>
<td>116</td>
<td>S/RT</td>
<td>100</td>
<td>68</td>
</tr>
<tr>
<td>Myers(^{10})</td>
<td>1996</td>
<td>65</td>
<td>S±RT</td>
<td>100</td>
<td>62(^{†})</td>
</tr>
</tbody>
</table>

Survival rates refer to disease-free survival when available, otherwise they refer to overall survival.

\(^*\) study included both laryngeal and non-laryngeal sites.

S = Surgery; RT = Radiation therapy; \(^{†}\) 2-year survival.
<table>
<thead>
<tr>
<th>Study and Patient Characteristics</th>
<th>Study Arms</th>
<th>Treatment of Disease in the Neck</th>
<th>Indications for Salvage Surgery After Chemoradiation Therapy</th>
<th>Overall Survival</th>
<th>Rate of Larynx Preservation</th>
</tr>
</thead>
<tbody>
<tr>
<td>VA Laryngeal Cancer Study (n = 332) Stage III/IV disease (%)</td>
<td>Chemoradiation Arm</td>
<td>Induction chemotherapy (3 cycles standard cisplatin and fluorouracil) followed by radiation therapy (66-76 Gy to primary site 50-75 Gy to nodes)</td>
<td>Lymph node dissection if residual disease after radiation therapy</td>
<td>68</td>
<td>66 years</td>
</tr>
<tr>
<td>(57/43, 2/3 primary lesions of the supraglottis; T3/T4 (%), 65/26; N0-N1 (%), 72)</td>
<td>Surgery Arm</td>
<td>Standard total laryngectomy followed by radiation therapy (50 Gy [no residual disease], up to 73 Gy [residual disease])</td>
<td>Lymph node dissection for all patients</td>
<td>68</td>
<td>2 years</td>
</tr>
<tr>
<td>GETTEC Study (n = 68) Stage III/IV (%)</td>
<td>Chemoradiation Arm</td>
<td>Induction chemotherapy (3 cycles standard cisplatin and fluorouracil) followed by radiation therapy (65-70 Gy to primary site 50-70 Gy to nodes)</td>
<td>Lymph node dissection if salvage surgery only</td>
<td>69</td>
<td>2 years</td>
</tr>
<tr>
<td>(not provided; T3/T4 (%), 100/0; N0-N1 (%), 93)</td>
<td>Surgery Arm</td>
<td>Standard total laryngectomy followed by radiation therapy (50 Gy [no residual disease], up to 70 Gy [residual disease])</td>
<td>Lymph node dissection for all patients</td>
<td>84</td>
<td>2 years</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>42</td>
</tr>
</tbody>
</table>

*P = .006*
### Table 3. Phase III Studies of Concurrent Chemoradiation Therapy for Larynx Preservation

<table>
<thead>
<tr>
<th>Study Arms</th>
<th>Treatment of Disease in the Neck</th>
<th>Indications for Salvage Surgery</th>
<th>Overall Survival</th>
<th>Larynx Preservation</th>
<th>Toxicity</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary radiation therapy: 70 Gy to primary site, 50-70 Gy to nodes</td>
<td>Lymph node dissection after completion of radiation therapy for all patients with clinical involvement of nodes before beginning of treatment</td>
<td>Less than partial response to induction chemotherapy; residual disease found at biopsy after completion of radiation therapy</td>
<td>75, 2 years</td>
<td>70, 2 years</td>
<td>Swallowing difficulties in 18% at 1 year and in 14% at 2 years</td>
</tr>
<tr>
<td>Induction chemotherapy: cisplatin/fluorouracil (3 cycles) followed by radiation therapy for those who had a response (if salvage surgery, 50-70 Gy administered postoperatively)</td>
<td></td>
<td></td>
<td>56, 5 years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Concurrent chemoradiation: high-dose cisplatin (days 1, 22, 43) plus 70 Gy to primary site; 50-70 Gy to nodes</td>
<td></td>
<td></td>
<td>76, 2 years</td>
<td></td>
<td>Rate of grade 3 or 4 toxicity during radiation no different from that for radiation therapy–alone arm; swallowing difficulties in 9% at 1 year and 16% at 2 years</td>
</tr>
<tr>
<td>Concurrent chemoradiation:</td>
<td></td>
<td></td>
<td>55, 5 years</td>
<td></td>
<td>Highest rate of grade 3 or 4 acute toxicity; no increase in late toxic effects; swallowing difficulties in 26% at 1 year and in 15% at 2 years</td>
</tr>
<tr>
<td>Radiation therapy alone</td>
<td></td>
<td></td>
<td>74, 2 years</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Cancer of the Glottic Larynx**

**WORKUP**
- H&P
- Biopsy
- Chest x-ray or Chest CT
- CT with contrast and thin cuts through larynx, or MRI of primary and neck recommended
- Examination under anesthesia with laryngoscopy
- Preanesthesia studies
- Dental evaluation
- Multidisciplinary consultation as indicated

**CLINICAL STAGING**

- Severe dysplasia/carcinoma in situ
  - See Treatment and Follow-up (GLOT-2)

- Total laryngectomy not required
  - Most T1-2, any N
  - See Treatment and Follow-up (GLOT-2)

- Resectable
  - Requiring total laryngectomy
  - Most T3, any N
  - See Treatment and Follow-up (GLOT-3)

- T4 disease
  - See Treatment and Follow-up (GLOT-4)

- Resectable
  - Poor medical/surgical risk
  - Definitive RT

**TREATMENT OF PRIMARY AND NECK**
Cancer of the Glottic Larynx

**Clinical Staging**

- Severe dysplasia/carcinoma in situ
  - Clinical trial or Endoscopic removal (stripping/laser) or RT<sup>c</sup>

- Total laryngectomy not required
  - Most T1-2, any N
  - RT to primary ≥ 66 Gy or Partial laryngectomy/endoscopic resection (selected superficial lesions) or Open partial laryngectomy

**Treatment of Primary and Neck**

- N0 → Observe
- N+ (rare) → Neck dissection and/or RT<sup>c</sup>

**Follow-Up**

- Physical exam:
  - Year 1, every 1-3 mo
  - Year 2, every 2-4 mo
  - Years 3-5, every 4-6 mo
  - > 5 years, every 6-12 mo
- Chest imaging as clinically indicated
- TSH every 6-12 mo, if neck irradiated
Cancer of the Glottic Larynx

**CLINICAL STAGING**

**TREATMENT OF PRIMARY AND NECK**

- **Primary site: Complete response**
- **Residual neck mass**
- **N1 (initial stage)**
- **N2-3 (initial stage)**

- **Primary site: residual tumor**

- **Salvage surgery + neck dissection as indicated**

- **Neck dissection (category 3 for selective vs comprehensive)**
  - **Observe**
  - **Observe or Neck dissection (category 3 for selective vs comprehensive)**

- **Selected T4**
  - Consider concurrent chemoradiation or Clinical trial for nonsurgical management

- **T4 disease**
  - **T4, N0**
    - Laryngectomy + ipsilateral thyroidectomy

- **T4, N1-3**
  - See Treatment and Follow-up (GLOT-5)

- **No adverse features**
  - Adjuvant RT
c

- **Adverse features:**
  - Close/positive margins
  - T4 disease
  - Perineural/lymphatic/vascular invasion
  - Multiple positive nodes
  - Extracapsular spread
  - Subglottic extension
  - Prior tracheostomy

- **Chemo/RT
c (category 1)**

- **Physical exam:**
  - Year 1, every 1-3 mo
  - Year 2, every 2-4 mo
  - Years 3-5, every 4-6 mo
  - > 5 years, every 6-12 mo

- Chest imaging as clinically indicated
- TSH every 6-12 mo, if neck irradiated
**Cancer of the Glottic Larynx**

**Clinical Staging**

- T4, N1-3 → Surgery
- N1 → Laryngectomy with ipsilateral thyroidectomy, ipsilateral comprehensive neck dissection ± contralateral selective neck dissection (reconstruction as indicated)
- N2-3 → Laryngectomy with ipsilateral thyroidectomy and ipsilateral or bilateral comprehensive neck dissection (reconstruction as indicated)

**Treatment of Primary and Neck**

- Adverse features:
  - Close/positive margins
  - T4 disease
  - Perineural/lymphatic/vascular invasion
  - Multiple positive nodes
  - Extracapsular spread
  - Subglottic extension
  - Prior tracheostomy
  - Chemo/RT\(^c\) (category 1)

- No adverse features → Adjuvant RT\(^c\)

- Physical exam:
  - Year 1, every 1-3 mo
  - Year 2, every 2-4 mo
  - Years 3-5, every 4-6 mo
  - > 5 years, every 6-12 mo

- Chest imaging as clinically indicated
- TSH every 6-12 mo, if neck irradiated
Definitive RT
- Primary and gross adenopathy:
  \[ \geq 70 \text{ Gy} \ (2.0 \ \text{Gy/day}) \]
  For early cancer of the glottic larynx, preferred dose is \[ \geq 2.0 \ \text{Gy/day} \] with total dose modification accordingly
- Neck
  - Low-risk nodal stations:
    \[ \geq 50 \text{ Gy} \ (2.0 \ \text{Gy/day}) \]

Adjuvant RT
- Primary: \[ \geq 60 \text{ Gy} \ (2.0 \ \text{Gy/day}) \]
- Neck
  - High-risk nodal stations:
    \[ \geq 60 \text{ Gy} \ (2.0 \ \text{Gy/day}) \]
  - Low-risk nodal stations:
    \[ \geq 50 \text{ Gy} \ (2.0 \ \text{Gy/day}) \]
**Cancer of the Supraglottic Larynx**

**WORKUP**
- H&P
- Biopsy
- Chest x-ray or Chest CT<sup>a</sup>
- CT with contrast and thin cuts through larynx or MRI of primary and neck recommended
- Examination under anesthesia with laryngoscopy
- Preanesthesia studies
- Dental evaluation
- Multidisciplinary consultation as indicated

**CLINICAL STAGING**

- **Resectable**
  - Not requiring total laryngectomy
  - Most T1–2, N0
  - See Treatment of Primary and Neck (SUPRA-2)

- **Resectable**
  - Requiring laryngectomy
  - T3, N0
  - T4, N0
  - No cartilage destruction
  - Low-volume base-of-tongue involvement
  - See Treatment of Primary and Neck (SUPRA-3)

- **Resectable**
  - T4, N0
  - Cartilage destruction
  - Skin involvement
  - Massive invasion of base of tongue
  - See Treatment of Primary and Neck (SUPRA-4)

- **Node positive disease**
  - See Workup and Clinical Staging (SUPRA-5)

- **Unresectable**
  - Resectable
  - Poor medical/surgical risk
  - See Treatment of Head and Neck Cancer (ADV-1)

- **Unresectable**
  - Definitive RT<sup>b</sup>
Cancer of the Supraglottic Larynx

**CLINICAL STAGING**
- Resectable
- Not requiring total laryngectomy
- Most T1–2, N0

## TREATMENT OF PRIMARY AND NECK

Endoscopic resection (selected T1 superficial lesions) or Open partial supraglottic laryngectomy ± selective lymph node dissection or Definitive RT

- One positive node without adverse features → Adjuvant RT\(^b\) optional
- Adverse features:
  - Multiple positive nodes
  - Extracapsular spread
  - Perineural/lymphatic/vascular invasion
  - Close/positive margins → Chemo/RT\(^b\) (category 1)

## FOLLOW-UP
- Physical exam:
  - Year 1, every 1-3 mo
  - Year 2, every 2-4 mo
  - Years 3-5, every 4-6 mo
  - > 5 years, every 6-12 mo
- Chest imaging as clinically indicated
- TSH every 6-12 mo, if neck irradiated
Cancer of the Supraglottic Larynx

CLINICAL STAGING

- Resectable
- Requiring laryngectomy
- T3, N0
- T4, N0
- No cartilage destruction
- Low-volume base-of-tongue involvement

TREATMENT OF PRIMARY AND NECK

- Laryngectomy, ipsilateral thyroidectomy with ipsilateral or bilateral selective neck dissection
- Concurrent chemoradiation (category 1) (preferred)
- Adjuvant RTb optional

- N0 or one positive node without adverse features
- Adverse features: Close/positive margins, Perineural/lymphatic/vascular invasion, Multiple positive nodes, Extracapsular spread

- or

- Residual neck mass
- Primary site: Complete response
- Complete response of neck
- N1 → Observe
- N2-3 → Observe or neck dissection (category 3 for selective vs comprehensive)
- Primary site: residual tumor
- Salvage surgery + neck dissection as indicated

FOLLOW-UP

- Physical exam:
  - Year 1, every 1-3 mo
  - Year 2, every 2-4 mo
  - Years 3-5, every 4-6 mo
  - > 5 years, every 6-12 mo
- Chest imaging as clinically indicated
- TSH every 6-12 mo, if neck irradiated

Recurrence (see ADV-2)
CLINICAL STAGING

- Resectable
- T4, N0
- Cartilage destruction
- Skin involvement
- Massive invasion of base of tongue

TREATMENT OF PRIMARY AND NECK

- Laryngectomy, ipsilateral thyroidectomy with ipsilateral or bilateral selective neck dissection or Clinical trial

- Adjuvant RT or Chemo/RT (category 1)

FOLLOW-UP

- Physical exam:
  - Year 1, every 1-3 mo
  - Year 2, every 2-4 mo
  - Years 3-5, every 4-6 mo
  - > 5 years, every 6-12 mo

- Chest imaging as clinically indicated
- TSH every 6-12 mo, if neck irradiated
Cancer of the Supraglottic Larynx

WORKUP

- H&P
- Biopsy
- Chest x-ray or Chest CT
- CT with contrast and thin cuts through larynx
- MRI of primary and neck recommended
- Examination under anesthesia with laryngoscopy
- Preanesthesia studies
- Dental evaluation
- Multidisciplinary consultation as indicated

Node positive disease

CLINICAL STAGING

- Resectable
  - Not requiring total laryngectomy
  - T1-2, N+ and selected T3-4
  - See Treatment of Primary and Neck (SUPRA-6)

- Resectable
  - Requiring total laryngectomy
  - Most T3-4, N+
  - No cartilage destruction
  - Low-volume base-of-tongue involvement
  - See Treatment of Primary and Neck (SUPRA-7)

- Massive T4, N+
  - Cartilage destruction
  - Skin involvement
  - Massive invasion of base of tongue
  - See Treatment of Primary and Neck (SUPRA-8)

- Resectable
  - Poor medical/surgical risk
  - See Treatment of Primary and Neck (SUPRA-8)

- Unresectable
  - See Treatment of Head and Neck Cancer (ADV-1)
Voice restoration in laryngectomees

- Electrolarynx
- Oesophageal speech
- Surgical voice restoration (TEP)
Following laryngectomy, voice is restored by creating a tracheo-oesophageal puncture.

The pharyngo-oesophageal (P-E) segment vibrates as air passes through the fistula, into the upper oesophagus and up into the pharynx.
A one-way valve is fitted

A one-way valve prevents leakage of saliva into the trachea
Tracheo-oesophageal puncture (TEP)

Pharyngeal defect following laryngectomy

Ryle’s tube passed through the puncture
Cricopharyngeal myotomy