Management of Early Glottic Cancer

- Early glottic cancer commonly presents as dysphonia associated with a white or red lesion of the vocal cord.

Management of Early Glottic Cancer

- Laryngeal leukoplakia is defined as a white lesion of mucosa that, based on its clinical features, cannot be assigned a definitive diagnosis. • Biopsy is the standard management of leukoplakia and serves to assess for either malignancy or risk for subsequent development of malignancy based on degree of dysplasia.

Early Glottic Cancer

- Patients (from an aggregate report of multiple publications) with laryngeal leukoplakia who are followed for 3 years following biopsy will develop invasive cancer in approximately 4% without dysplasia, 10% with mild/moderate dysplasia, and 18% with severe

Early Glottic Cancer

- The glottis represents the site where approximately 50% of laryngeal cancers arise; 95% of laryngeal malignancies are squamous cell carcinoma.
- Glottic cancers are considered “early” when they are defined as either stages 0 (TisN0M0), stage I (T1N0M0), or stage II (T2N0M0).

Early Glottic Cancer

Tis represents carcinoma in situ (stage 0) which is considered synonymous (by many pathologists) with severe dysplasia, also termed squamous intraepithelial neoplasia Grade 3.

Early Glottic Cancer

- Invasive early glottic cancer (stage I and II) is classified according to cord mobility (T1 normal, T2 impaired) and spread outside the glottis (T1a one cord, T1b both cords, T2 supraglottis or subglottis).

Early Glottic Cancer

- Five-year relative survival is approximately 90% for T1N0 tumors and 75% for T2N0 glottic squamous cell carcinoma.

Early Glottic Cancer

- Second primary tumors (lung followed by head and neck) are the most common cause of death in patients with early glottic cancer.

Early Glottic Cancer

- Diagnosis of glottic cancer is by laryngoscopy and biopsy. Evaluation may include a CT (or MRI) of the larynx for cartilage invasion and paraglottic space assessment. Advanced imaging is generally not needed for small mid-membranous vocal cord cancers.

Early Glottic Cancer

- Radiotherapy is an effective treatment modality and is the most commonly used modality for early glottic cancer in North America

Early Glottic Cancer

- Treatment with radiotherapy may result in the best final voice quality in some patients retaining their larynx. Close follow-up is valuable for early detection of persistent/recurrent disease to offer the best chance for cure and to increase the opportunity for salvage with laryngeal conservation surgery.

Early Glottic Cancer

- Radiation therapy may be the best choice for those with medical comorbidities that increase surgical/anesthetic risks

Early Glottic Cancer

- Radiotherapy for early glottic cancer can have rare late sequelae, such as hypothyroidism, radiation-induced cancers, and carotid artery stenosis.

Early Glottic Cancer

- Larynx-preserving alternatives to radiotherapy include open laryngeal conservation surgery as well as transoral endoscopic approaches, either for resection or for less commonly used ablative treatments, including photodynamic and photoangiolytic laser treatment.

Early Glottic Cancer

- Initial evaluation with yearly interval screening should include consideration for low-dose CT (LDCT) imaging of the chest to supplant the routine chest xray that had been recommended for screening in the past.

Early Glottic Cancer

- Discrimination between a precursor lesion and an early invasive cancer may be difficult and almost always requires a biopsy to fully characterize

Early Glottic Cancer

- The appearance of diffuse carcinoma in situ (CIS) of the gliottic larynx progressing to mild/moderate dysplasia to recurrent CIS to invasive cancer (following initial treatment with irradiation) is identified in a nonsmoker with the onset of dysphonia 1 year before initial diagnosis

low-dose CT (LDCT)

- Annual chest x-rays have been supported as useful in the past in the course of clinic follow-up examinations primarily because of the high incidence of second primary lung cancers in patients managed for laryngeal cancAdvances in screening for lung cancers with low-dose CT (LDCT) imaging has led to new recommendations from the U.S.

low-dose CT (LDCT)

- A significant reduction in mortality from lung cancer (20%) and from all cause mortality (6.7%) and prompted the introduction of LDCT screening for asymptomatic populations at risk for lung cancer.

low-dose CT (LDCT)

- Improved application of LDCT for screening includes a decrease in the radiation dose as well as improved detection through computer-aided diagnosis (CAD) as a second reader.

low-dose CT (LDCT)

- National organizations have published recommendations for screening to include 50-year-old smokers with 20 pack-years and another risk factor such as family history or radon exposure.

low-dose CT (LDCT)

- Other published guidelines identify that 55- to 74-year-olds who are current or former smokers with a 30 pack-years smoking history are appropriate candidates for LDCT screening.

nodule assessment

- The development of strategies for nodule assessment has also improved the utility of this approach(LDCT). One published strategy is to include repeated interval imaging with CT for low cancer risk nodules (<10%), to include further assessment with positron emission tomography (PET)/CT for those nodules with a moderate risk (10% to 60%), and surgery for those with high risk (>60%).27

nodule assessment

- Chest CT is more sensitive; practitioners should be cautioned that use of chest CT for screening in early gloic cancer may lead to identification of clinically insignificant nodules. In the initial assessment of a patient with early gloic cancer, use of CT to evaluate for lung nodules is a complex decision which merits discussion between patient and physician.

screening the esophagus

- These investigators concluded that neither a chest x-ray nor fiberoptic bronchoscopy were useful in supporting this initial assessment. They additionally identified value in screening the esophagus with flexible endoscopy for the routine pretreatment evaluation of patients with laryngeal cancer who had a history of chronic alcohol intoxication, and more liberal application for those with hypopharyngeal and oropharyngeal primary cancers.

screening the esophagus

- They identified significant shortcomings to use of rigid esophagoscopy when compared to the preferred flexible fiberoptic exam and offered the comment that use of NBI “seems promising, but remains to be validated”

Magnetic Resonance Imaging and Computed Tomography

- Most early laryngeal cancers will be assessed through clinical exam, endoscopy, and most commonly with a fine-cut CT to assess for spread into the paraglottic space and potential invasion into or through the thyroid cartilage.

Magnetic Resonance Imaging and Computed Tomography

- These advanced imaging studies are of questionable value in the assessment of most superficial T1 lesions of the vocal cords. The more routine use of MRI or CT is advocated in the evaluation of T2 lesions not only to help determine tumor extent (and hence T classification) but also tumor volume.

Magnetic Resonance Imaging and Computed Tomography

- Selected T1 lesions with anterior commissure involvement may benefit from MRI or CT imaging if extension of the tumor superiorly into the preepiglottic space or anteriorly into the thyroid cartilage is detected.

Magnetic Resonance Imaging and Computed Tomography

- The more routine use of MRI or CT is advocated in the evaluation of T2 lesions not only to help determine tumor extent (and hence T classification) but also tumor volume,

Magnetic Resonance Imaging and Computed Tomography

- Some authors have suggested that CT or MRI of T2 lesions may help determine radiocurability by assessing tumor volume. Other investigators have not found the size of the tumor to be useful for predicting radiocurability

Magnetic Resonance Imaging and Computed Tomography

- The investigators identify that tumor involvement of the entire vocal cord or the anterior commissure, as well as the presence of vocal fold paresis, is considered an indication for the use of MRI. Most superficial T1 lesions of the mobile portion of the vocal cord need not be imaged because MRI will not detect the extent of these lesions

Positron Emission Tomography

- 18F-fluorodeoxyglucose (FDG) PET scanning has been reported as useful in detecting subclinical recurrent or persistent cancer at a stage when it is highly curable
- . Investigators concluded that an FDG PET scan should be the first diagnostic step when a recurrence is suspected after treatment with irradiation.

Positron Emission Tomography(PET)

- As a result of this study, in which the majority of cases were glottic and classified as either T1 or T2, these investigators suggested that no biopsy is necessary if the scan is negative. In the face of a positive scan and a negative biopsy, a follow-up scan showing decreased FDG uptake would indicate that a recurrence is unlikely.

Positron Emission Tomography(PET)

- In the face of a positive scan and a negative biopsy, a follow-up scan showing decreased FDG uptake would indicate that a recurrence is unlikely. Caution should be exercised in following these guidelines if other clinical indicators support the need for a biopsy. At this point, endoscopy with a biopsy to sample tissue suspicious in appearance for cancer remains the most critical means by which recurrence is evaluated

Positron Emission Tomography(PET)

- Shortcomings of PET imaging have been noted. Most investigators suggest waiting at least 3 months after treatment to perform PET imaging because false-positive results are common if the imaging is done soon after radiotherapy is completed. False positives may also result from infection, radionecrosis, or accumulation of saliva in the vallecula.

PET imaging with 1-[1-11C]-tyrosine (TYR) TYR PET

- The presence of viable tumor has been identified through PET imaging with 1-[1-11C]-tyrosine (TYR). TYR PET imaging analyzes protein synthesis activity and has been reported to be successful in detecting recurrent squamous cell carcinoma of the larynx

Stagingof glottic cancer

- Primary Tumor (T) Classification of Glottic Cancer Tx Primary tumor cannot be assessed T0 No evidence of primary tumor Tis Carcinoma in situ T1 Tumor limited to the vocal cord(s) (may involve anterior or posterior commissure) with normal mobility T1a Tumor limited to one vocal cord T1b Tumor involves both vocal cords T2 Tumor extends to supraglois or subglois, or with impaired vocal cord mobility T3 Tumor limited to the larynx with vocal cord fixation and/or invasion of the paraglottic space, and/or inner cortex of the thyroid cartilage T4a Moderately advanced local disease Tumor invades through the outer cortex of the thyroid cartilage and/or invades tissues beyond the larynx (e.g., trachea, soft tissues of neck including deep extrinsic muscle of the tongue, strap muscles, thyroid, or esophagus) T4b Very advanced local disease Tumor invades prevertebral space, encases carotid artery, or invades mediastinal structures Summarized from Edge SB, Byrd DR, Compton CC, et al.: AJCC cancer staging manual, ed 7, New York, 2010, Springer Verlag

borders of the paraglottic space

The borders of the paraglottic space as they have been commonly reported by others:

- Anterolateral: the thyroid cartilage.
- Inferomedial: the conus elasticus.
- Medial: the ventricle and the quadrangular membrane.
- Posterior: the pyriform sinus.