

Carcinoma of the larynx

Carcinoma of the larynx is the most common head & neck cancer, this has a high cure rate which may reach 90%.

Incidence:

- It is more common in males than females in ratio 5:1.
- More common in elderly, peak age is the seventh

decade. Aetiology:

- The exact cause of Carcinoma of the larynx is not known, but a number of related factors including:
 1. Tobacco smoking
 2. Alcohol drinking
 3. Asbestos exposure
 4. Radiation exposure
 5. Pre-malignant conditions as leukoplakia, keratosis, atypia, papilloma.

Pathology:

- The commonest site is the glottic region (true vocal cords).
constituting about 75% of cases.
- 20% in the supraglottic region.

.5% in the subglottic region.

Histopathology:

The majority is Squamous cell carcinoma, with different grades of differentiation (poor, moderate or well differentiated).

Spread:

- Direct spread: invasion of laryngeal framework in vertical & circumferential direction, & may spread outside the larynx into adjacent tissues surrounding the larynx as the thyroid gland, trachea, esophagus & recurrent laryngeal nerve. Fixation of the vocal cords in Ca larynx may result from invasion of arytenoid cartilage, crico-arytenoid joint, crico-thyroid muscle or

recurrent laryngeal nerve.

- Lymph node spread: to the deep cervical lymph nodes (jugular), prelaryngeal or paratracheal lymph nodes. supraglottic region has a rich lymphatic drainage, & less for the subglottic region, but the glottic region (vocal cords) has practically no lymphatic drainage, so that Ca of the vocal cords rarely spread to the lymph nodes
- Distant metastasis: rare for all sites, only 5% of patients presented with Ca larynx have distant metastasis, which is mainly to the lung.

Clinical features:

1. Progressive & unremitting *Dysphonia or hoarseness* (change of voice), this is an early symptom in glottic tumor.
2. *Pain*: more common in supraglottic tumors & it may radiate to the ear. It indicates invasion of the laryngeal cartilage.
3. *Dyspnea & stridor*: indicates advanced tumor. Subglottic tumor may present with these symptoms as the only symptoms.
4. *Dysphagia*: also in advanced tumor, indicates invasion of the pharynx or esophagus.
5. *Cervical lymphadenopathy*: which may be bilateral, it is more for supraglottic Carcinoma & rare in glottic Carcinoma.
6. *Cough & hemoptysis*.
7. *Anorexia, cachexia* are late symptoms.

Investigations:

Useful for:

- Assessment of the general condition & fitness of the patient.
- Diagnosis of the disease.
- Determination of the extent & stage of the disease .

They include the following:

1. *Full hematological investigations*: including CBP & ESR.

2. *Biochemical profile*: including renal & liver function tests, serum electrolytes & blood sugar.

3. *Radiological*: CXR, CTScan & MRI to the neck.

4. *ECG*.

5. *Endoscopic examination*: of the larynx & biopsy from the suspected area sent to histopathology. Endoscopic examination should not only be done for the larynx, but also for the pharynx, esophagus & bronchial tree to exclude second or metastatic tumor.

TNM classification of laryngeal tumor: TNM classification help us in determine the treatment plan & prognosis of the tumor.

"T" Tumor

T_{is}: carcinoma in

T₁: tumor limited to one subsite with normal vocal cord mobility.

T₂: tumor extends to more than one region with or without impaired vocal cord mobility.

T₃: tumor limited to the larynx with vocal cord fixation

T₄: tumor extends outside the larynx or invade thyroid &/or cricoid cartilage.

"N" Lymph node:

N₀: No regional LN metastases.

N₁: single ipsilateral LN ≤ 3 cm in size.

N₂: a. ipsilateral single LN 3 - 6 cm.

b. ipsilateral multiple LN ≤ 6 cm.

c. bilateral or contralateral LN ≤ 6 cm.

N₃: LN > 6 cm.

"M" Metastasis:

M₀: no distant metastasis.

M₁: distant metastasis is present.

Staging:

- Stage 0: Tis N0M0.
- Stage I: T1 NO M0.
- Stage II: T2 NO M0.

- Stage III: T3 NO MO
Or(T1-T2-T3) N1M0
- Stage IV:T4any N any M.
Or any T(N2-N3) anyM.
Or any T any N M1.

Treatment of Ca larynx:

I- Early tumors (stage I & II):

Best treated with *Radiotherapy*, external beam or interstitial radiation, with preservation of the larynx. Cure rate for early tumors is high reaching 85-90%

the alternatives to radiotherapy are:

- a. Partial laryngectomy: removal of part of the larynx which is involved, as cordectomy if tumor limited to vocal cord with normal mobility. Or epiglottectomy if limited to epiglottis.
- b. Laser surgery: applicable for Small tumors & carcinoma in situ.

Complications of radiotherapy:

1. Mucositis: painful ulceration in the oral cavity & pharynx.
2. Skin complications: desquamation, necrosis, pigmentation & telangiectasia.
3. Perichondritis of the laryngeal cartilages.
4. Laryngeal edema.
5. General side effects: malaise, anorexia & weakness.
6. Late complications: induction of secondary malignancies as thyroid tumor, Osteosarcoma.

II- Advanced tumors (stage III & IV):

The best is radical surgery in the form of Total laryngectomy with

or without *Partial pharyngectomy* if the pharynx involved, also with or without *Neck dissection* for lymph nodes metastasis. Post-operative *Radiotherapy* might be given for extensive tumor to eradicate microscopic metastasis.

III- Palliative treatment: for patients with:

- Distant metastasis.
- Inoperable primary tumor.
- Poor general health (patient unfit for radical treatment).

Palliative treatment includes:

1. *Pain relief (using analgesics).*
2. *tracheostomy for airway obstruction.*
3. *Radiotherapy & Chemotherapy.*

Vocal cord paralysis

Position of the Vocal folds

The position of the vocal folds may be described as being in various positions.

- 1- Abducted position 30 to 45 degrees from the midline. This is the position of maximal abduction during inspiration.
- 2- Cadaveric position, or intermediate, 15 to 20 degrees from the midline. This is the position of immediate total denervation of both the SLN & RLN as in high vagal paralysis.
- 3- Paramedian position, just off midline. The resting position of vocal folds after long-term RLN injury.
- 4- Median position, the position of SLN paralysis & normal larynx during phonation.

Aetiology of Vocal cord paralysis:

- 1- Tumor in the thyroid gland, mediastinum, esophagus, or larynx.
- 2- Surgical trauma (most commonly by thyroidectomy).
- 3- Mediastinal compression (cardiac hypertrophy, aortic aneurysm, mediastinal and lung masses).
- 4- Toxic neuritis following influenza, alcohol, lead or arsenic poisoning.
- 5- Collagen vascular diseases.
- 6- Sarcoidosis (diagnosed by ACE level).
- 7- Lyme disease (diagnosed by Lyme titer).
- 8- Syphilis (FTA-ABS, VDRL).
- 9- Infectious mononucleosis.
- 10- Diabetic neuropathy.
- 11- Central lesion (rare).

12- Unknown (about 20%).

Symptoms:

Depend on,if the VC paralysis unilateral or Bilateral, &if the type of theVC paralysis if abductor or adductor type (clinicallyVC paralysis devided into 2 types:abductor & adductor type depend on the direction of movement which is the VC can not make it)

1) **unilateral abductor VC paralysis**(Paramedian position)(pure unilateral RLN injury)

Hoarseness is usually the only symptom of unilateral laryngeal paralysis. Initially, some patients have aspiration of liquids during swallow, and this symptom improves with time.

2)**unilateral adductor VC paralysis**(Cadaveric position)(injury of both the SLN & RLN as in high vagal paralysis).Patient complain from breathy dysphonia, vocal fatigue, and dyspnea with speaking. aspiration of liquids during swallow , this symptom often gradually disappears as the healthy vocal fold increases its excursion beyond the median line.

Treatment of 1)& 2)

Treatment may be nonsurgical (i.e. voice therapy) or surgical therapy which includes the following;

- 1- vocal fold injection
- 2- medialization thyroplasty
- 3- arytenoid adduction
- 4- laryngeal reinnervation

3)**Bilateral abductor paralysis**(Paramedian position)

Bilateral abductor paralysis is the most common form of bilateral motor paralysis,mostly caused by extensive thyroid surgery. Symptoms include hoarseness , cough mechanism is less forceful & as the vocal cords approach the median line, respiratory embarrassment may become increasingly severe, progressive dyspnea with exertion ,stridor may need emergency tracheostomy.

Treatment may include tracheostomy with speaking valve, endolaryngeal or extralaryngeal arytenoidectomy,CO2 laser cordotomy ,laryngeal reinnervation .

4)**Bilateral adductor paralysis**(Cadaveric position)

mostly caused by neurological causes(CVA,CNS neoplasm,head trauma)Symptoms include hoarseness,breathy dysphonia, vocal fatigue, and dyspnea with speaking. aspiration of liquids during swallow,Severe glottal incompetence in the postoperative patient may result in poor pulmonary toilet, which prolongs patient morbidity .

Treatment

- 1- vocal fold injection.
- 2- epiglottopexy.
- 3-nasogastric tube&permenant tracheostomy.

4- Total laryngectomy.

Investigations:

1. Full hematological investigations: including CBP & ESR.
2. Biochemical & serological tests : including blood sugar.
3. Radiological: XRay of neck&nasopharynx, CT Scan from skull base to mid thorax, thyroid scan & barium swallow.
4. laryngeal EMG .
5. Endoscopic examination: panendoscopic examination for the larynx, pharynx, esophagus & bronchial tree& biopsy from the suspected area&/or from the nasopharynx & bronchial carina sent to histopathology.