

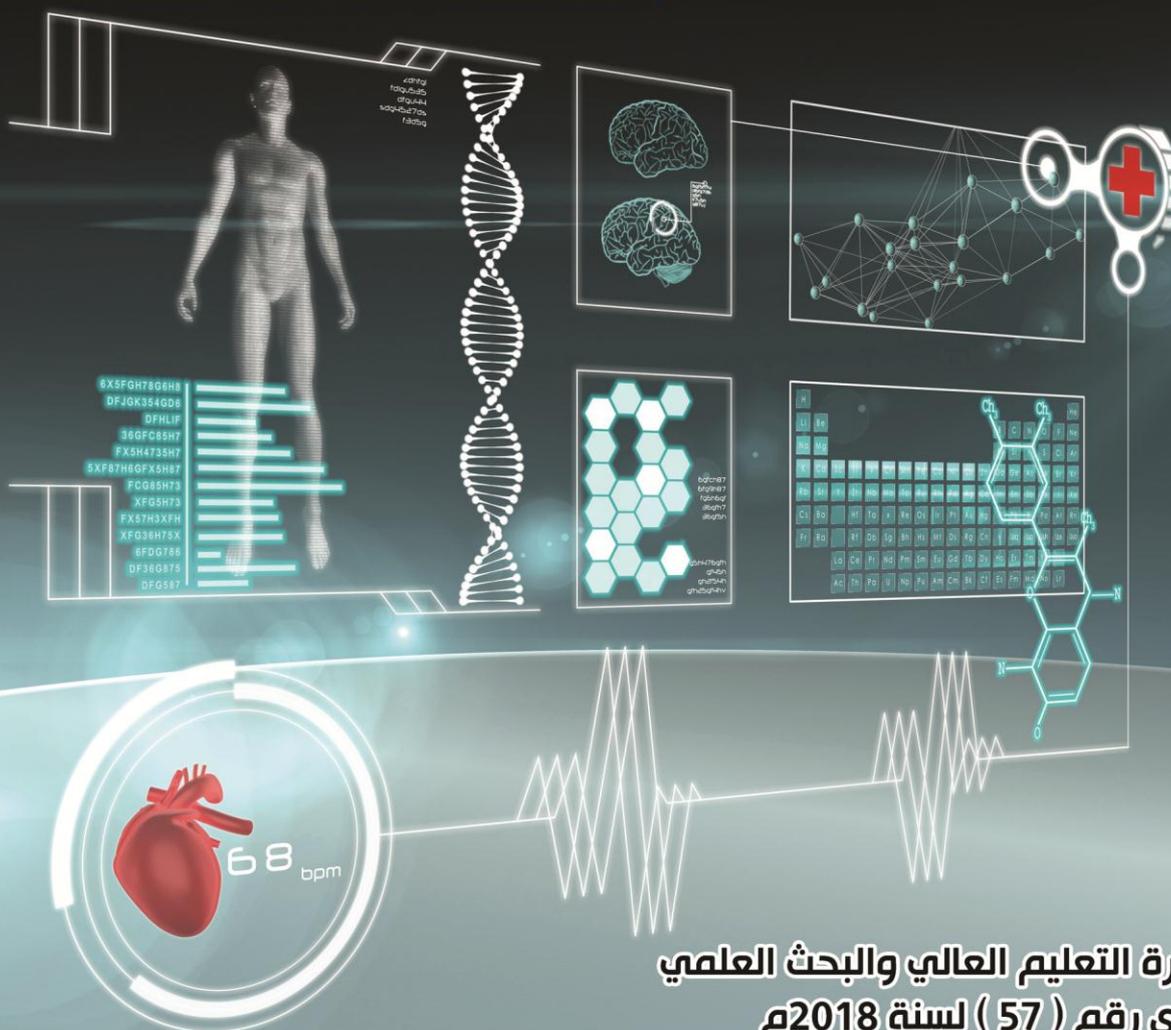
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**Tumors of the Larynx in Yemen: Prevalence and Treatment**

Ali Obaid Muthanna

*Otolaryngology, Head & Neck Surgery Department, Faculty of Medicine and Health Sciences, Sana'a University, Yemen***Corresponding author email: muthannadr@yahoo.com***Abstract**

Background: Laryngeal cancer is known to be associated with tobacco use, alcohol abuse and other chemical carcinogens. **Aim:** To determine the prevalence and methods of treatment of laryngeal tumors in adult patients. **Methods:** Hospital based study was carried out from May 2010 to March 2016 at ENT department, at Al-Thowrah Hospital Sana'a, Yemen. A total of 130 patients were enrolling in this study. All patients had laryngeal tumors underwent to clinical examination, investigations, and treated according to type of tumors. **Results:** A total of 130 patients were enrolling in this study, males (76.9%) and Females (23.1%), mean ages were 48.1years. Neoplastic tumors (62.3%), malignant (96.3%), benign (3.7%), non-neoplastic tumors (37.7%), laryngeal polyp consisted (65.4%) of benign lesions. Hoarseness (100%), difficulty of breathing (34.6%). Left side involved (61.5%). Advanced malignant (64.1%), early malignant (30.8%), insitu (5.1%), glottic area (76.9%), supraglottic (14.2%), while transglottic was (10.3%). Modalities of treatment, excision by laryngoscope (35.4%), radiation (32.3%), total laryngectomy (27.7%) speech therapy (3.1%), external approach (1.5%). **Conclusion:** Malignant tumors were the most tumors of the larynx, and Laryngeal polyp were the most non-neoplastic tumors in the larynx. Surgical intervention was the main standard method of treatment either neoplasm or non-neoplasm tumors followed by radiation for malignant.

Keywords: Laryngeal tumors, Benign lesions, Laryngeal cancer, polyp.**Introduction**

Tumors of the larynx include all masses in the larynx, neoplastic and non-neoplastic. On neoplastic are inflammatory, traumatic, or degenerative origin, neoplastic tumors, benign or malignant.¹ The symptoms produced by the tumor depended on the location and the size of tumor. Those located on the true vocal cords may present initially with hoarseness of voice, subglottic tumors presenting with dyspnea and stridor, while supraglottic tumors may present with dysphagia and muffled voice.² A benign lesions of the larynx was defined as any mass of tissue in the

larynx which does not present characteristic of malignant.^{1,2} Benign tumors of the larynx are of interest and importance to the laryngologist not only because of the symptoms which they produce by interference with normal function of the vocal mechanism or by obstruction of the respiratory tract, but because of the necessity of distinguishing them from malignant laryngeal lesion.^{3,4} The common complaints, hoarseness or change of voice, vocal fatigue, foreign body sensation dyspnea, and stridor depend on the type of laryngeal tumors.^{5,6} Non neoplastic tumors to be

more common as compared to neoplastic tumors of the larynx.⁵ Surgical removal with microsurgical instruments remains the mainstay of the therapy for laryngeal polyp, cysts and nodules.⁷ Laryngeal cancer is the most common head and neck cancer worldwide. Over 90% of laryngeal cancer is squamous cell carcinoma (SCC). Patients with laryngeal cancer initially presenting with airway obstruction is uncommon, because over 70% of tumors originated on the true vocal fold creating the early symptom of hoarseness.⁸

Aim of the study

The aim of the study was to determine the prevalence and methods of treatment of laryngeal tumors in adult patients attended to Al-Thowrah hospital, Sana'a .

Subjects and Methods

A hospital based study was conducted at the department of otolaryngology head and neck surgery, Al-Thowrah general modern hospital, Sana'a, Yemen from May 2010 to March 2016. A total of 130 patients, males 100 patients and female 30 patients were enrolled in this study. Data were collected by special form include age and sex. History taking, ENT examination, Indirect laryngoscope, fiber optic laryngoscope, hematological and radiological investigations were done. Treatment advised was either conservative medical/ speech therapy surgical procedures included direct laryngoscope, microlaryngoscope, tracheotomy or tracheostomy and partial or total laryngectomy. All

excised tissues were sent for histopathological examination. Post-operative management includes voice rest, speech therapy for benign lesions, care of tracheotomy and voice rehabilitation. Data were processing and analysed using SPSS, Version 20. Frequency, percentage and mean were used. The study was approved by ethical board of our department. Informed consent was obtained from patients before the study enrolment.

Results

A total of 130 patients were included in the study, their ages ranged from 25-75 years with mean age 48.1 years. Males 100 (76.9%) and females 30 (23.1%). Table 1. Patients had neoplasm 81(62.3%), malignant 78 (96.3%) and 3 (3.7%) patients complaint of benign neoplasm. Their ages ranged from 31-75 years with mean age 54.2 years for malignant neoplasm. Non neoplastic tumors were found in 49 (37.7%) patients their ages ranged from 25-75 years with mean age 39.6 years. Table 2 reveals that malignant neoplasm was occurred more in age group 41-50 (39.7%) and less in the patients > 70 (2.6%).

Non-neoplastic age categories shown in table 3. The results of the study showed that the majority (53.1%) of patients with non-neoplastic lesions in age ranged from 25-34 years followed by (20.4%) of the patents with age ranged from 35-44 years. Laryngeal polyps represented 32 (65.4%) of non-neoplastic lesions. The results of the study showed that the majority (53.1%) of patients with laryngeal polyps in age ranged from 25-34 years Table 4.

Table 1: Patients sex and age categories (N=130)

| Patients sex and age | F | % |
|-----------------------|-----|------|
| Sex | | |
| • Male | 100 | 76.9 |
| • Female | 30 | 23.1 |
| Age categories | | |
| • 25-34 | 26 | 20 |
| • 35-44 | 20 | 16.1 |
| • 45-54 | 41 | 30.8 |
| • 55-64 | 27 | 20.8 |
| • 65-65 | 16 | 12.3 |

Table 2: Distribution of age categories according to malignant tumors (n=78)

| Age categories | F | % |
|----------------|----|------|
| • 31-40 | 10 | 12.8 |
| • 41-50 | 31 | 39.7 |
| • 51-60 | 24 | 20.8 |
| • 61-70 | 11 | 14.1 |
| • > 70 | 2 | 2.6 |
| Total | 78 | 100 |

Table 3: Distribution of age categories according to non-neoplastic lesions (n=49)

| Age categories | F | % |
|----------------|----|------|
| • 25-34 | 26 | 53.1 |
| • 35-44 | 10 | 20.4 |
| • 45-54 | 6 | 12.2 |
| • 55-64 | 3 | 6.1 |
| • 65-74 | 4 | 8.2 |
| Total | 49 | 100 |

Table 4: Distribution of age categories according to laryngeal polyp (n=32)

| Age categories | F | % |
|----------------|----|------|
| • 25-34 | 17 | 53.1 |
| • 35-44 | 6 | 18.7 |
| • 45-54 | 4 | 12.5 |
| • 55-64 | 2 | 6.3 |
| • 65 -74 | 3 | 9.4 |
| Total | 32 | 100 |

Figure 1 presenting symptoms of all laryngeal lesion either neoplasm or non-neoplasm. In addition, the left side was affected more than right side 48 (61.5%) of malignant and 30 (61.2%) of non-neoplastic lesions were found in the left side. Advanced laryngeal carcinoma (T3,T4) presented in 50

patients (64.1%) of malignant where early carcinoma (T1,T2) found in 24 patients (30.8%) and 4 patients (5.1%) in situ. Regarding the origin of laryngeal cancer, glottic region was the most common region affected 60 (76.9%) of malignant found in it, supraglottic 10 (14.2%), while

transglottic found in 8 (10.3%) of malignant lesion, figure 2. Modalities of treatment showed in figure 3. Excision by laryngoscopy 46

(35.4%) patients, radiation 42 (32.3%) patients, total laryngectomy 36 (27.7%) patients.

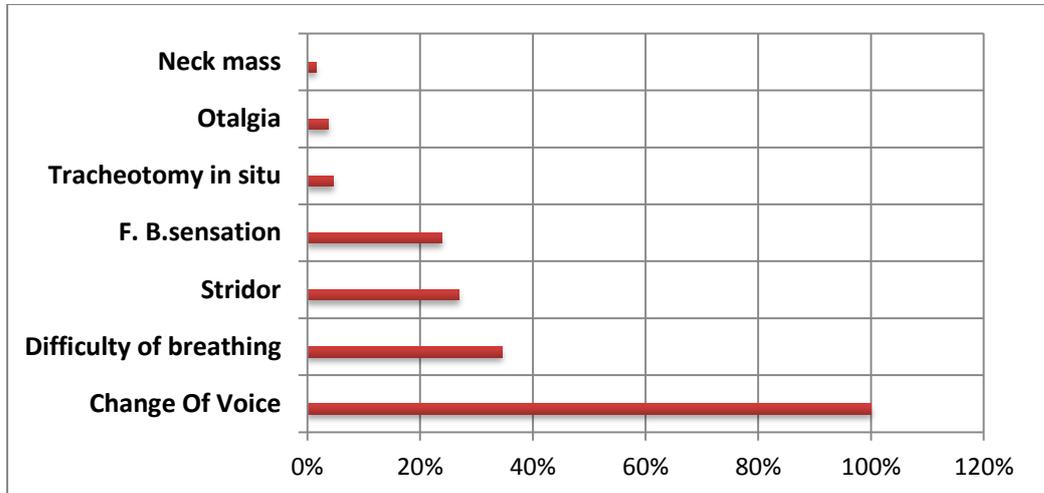


Figure 1: Presenting symptoms of all laryngeal lesion among patients

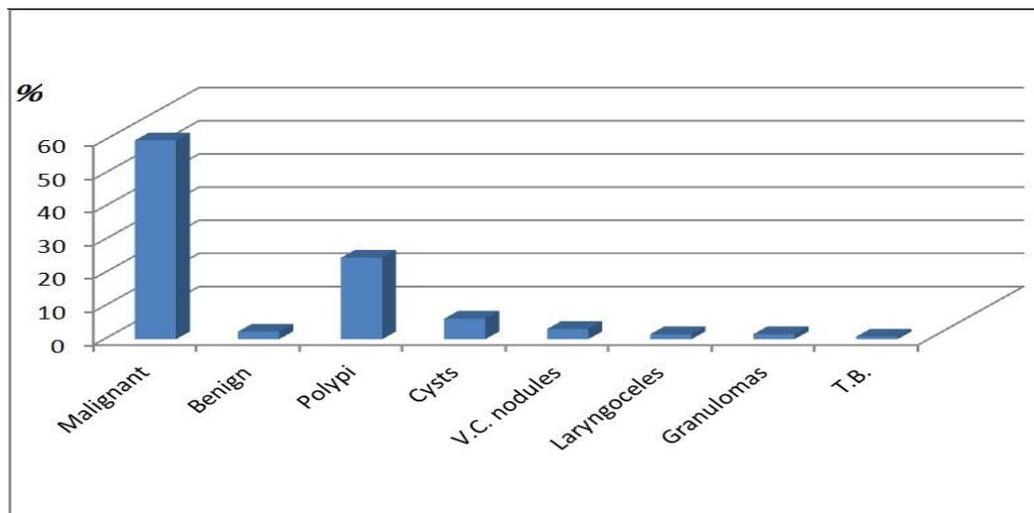


Figure 2: Types of laryngeal tumors among patients

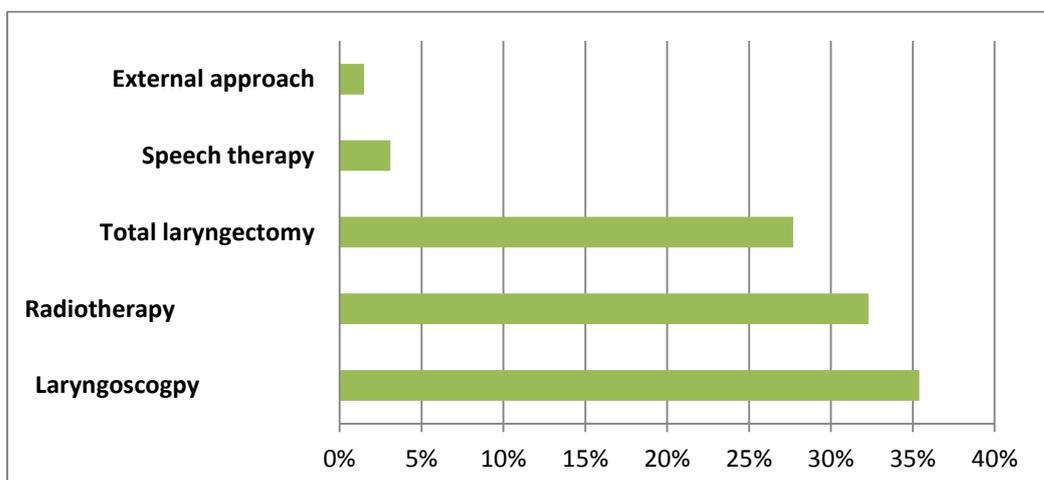


Figure 3: Methods of treatment of laryngeal tumors among patients

Discussion

In 1938, New and Erich proposed that true proliferated neoplasms were often clinically indistinguishable from non-proliferative inflammatory or hyperplastic growths, the term benign tumors should be used to include all abnormal growth of tissue in the larynx that lacked malignant or metastasis properties.¹ The presence of mass lesion in the larynx can provoke numerous acute, chronic, progressive or even life-threatening symptoms.⁶ When assessing the patient with a potential laryngeal lesion, history should be taken with particular emphasis on the age of the patient, the course of symptoms complex, any previous surgery or trauma and presence or absence of respiratory symptoms. Cancer larynx is the most common head and neck cancer worldwide^{8,9,10}. Over 90% of laryngeal cancers are squamous cell carcinoma. Patients with laryngeal cancer initially presenting with airway obstruction is uncommon, because over 70% of tumors originate on the true vocal fold creating the early symptom of hoarseness. Those with supraglottic or subglottic early tumors may first present with stridor or dyspnea. Patients have airway obstruction due to delayed diagnosis.⁸

The first line of treatment of lesions caused by phono trauma is behavioral intervention with speaking and singing therapy. The primary goal of voice therapy is to maximize efficiency of phonation and to elimination maladaptive vocal behaviors that exacerbate these masses. Additionally, patients should be treated for concomitant problems that contribute to mucosal friability, such as laryngopharyngeal reflex and poor vocal hygiene. When maximal behavior intervention does not achieve satisfactory improvements in voice. Surgical intervention is consider. The

decision to surgical intervention however, should take into account multiple factor, including the patient vocal cord impairment, type and location of the lesion and willingness to accept surgical risk⁶.

Age group ranged between 45-64 years more affected 51.6% of all patients' complaint of laryngeal tumors while malignant found high incidence in age group ranged between 41-60 years 70.5%. Males were 76.9% and females 23.1%. Neoplasm found in 62.3% of patients while non-neoplastic 37.7% which mean that neoplasm is more than non-neoplasm. The findings of our study consisting with the previous studies.^{11,12,13} Singhal et al.⁵ found non neoplastic tumors were more than neoplastic types, this results contradicts with the findings of our study.

According to the present study, the occurrence of both benign and as well as malignant tumors were higher in males than females where it is 76.9% in males and 23.1% in females. The findings of our study, were concordance with some previous study.^{6,14,15} The most common benign lesion was vocal cord polyp 65.4% where the occurrence of malignant was (96.3%) of neoplastic tumors in this study. These findings agreement with the results of previous studie.^{5,6,1} Regarding the site of origin of the tumors, glottic region was found to be the commonest site for the origin of all neoplastic and non-neoplastic tumors it is found in 76.9 %. The left side tumors were more than right side it is represented 61.5% of tumors without clear cause. These findings agreement with previous studies.^{3,5,11} Bakshi et al.¹⁶ reported that laryngeal malignancy found that 56 % of tumors were supraglottic, and (17%) in glottic region, Sharma et al.¹¹ reported that 50 % of malignant tumors were found in supraglottic region, and 20% glottic

region, these findings contradict with our findings. Advanced laryngeal cancer (T3,T4) found in 64.1% of malignant tumors due delayed diagnosis and lack health seeking behavior of the patients.

Menach et al.⁹ reported that majority of patients presented stages T3,T4) in 73.6% of laryngeal cancer due to the health seeking behavior, Lack of adequate health facilities and personnel as well as high cost of Hoarseness was the main symptom with all patients of benign and medical care. Malignant tumors presented in 100% while difficulty of breathing was found in 34.6% of patients, most of them had malignant tumors.

Pal et al¹⁷ reported that hoarseness of voice is the commonest symptom in otolaryngological practice and it indicates disease of the larynx ranging from totally benign condition to the most malignant condition. Sharma et al.¹¹ Bakshi et al.¹⁶ mentioned that hoarseness was the earliest presenting symptom in both benign as well as malignant growth. While most patients with benign tumors had only one symptom, patients with malignant tumors had associated symptoms like dyspnea, dysphagia cough, haemoptysis. This findings agreement with our study, because the majority tumors were originated from glottic area. Regarding the treatment of laryngeal tumors, non-neoplastic and benign neoplasm all treated by surgical excision through direct laryngoscopy under general anesthesia except 1.5% of patients' complaint of combined laryngocel treated by external approach. Malignant tumors were treated by combined treatment, surgical and radiation or radio-chemotherapy in form of surgical excision followed by radiation for early cancer larynx (T1,T2) 30% of malignant, and total laryngectomy and radiotherapy for advanced cancer

larynx (T3,T4) were 27.7% of patients, and 32.3% of patients refused surgical intervention referred to radio chemotherapy .The goal of cancer treatment is to cure the patient and preserve the function of the larynx. Treatment philosophy of patients with cancer larynx is preservation of the form and function of the larynx whenever possible reserving ablative option for advanced cancer or when organ preservation is impossible.^{18,19} Post- operative management for benign lesions include, voice rest, for three weeks followed by resumption of voice in order to resume the normal function of the vocal cords. Along with this regime, the patient was also advised to avoid extremely hot and cold food, exposure to air pollutions, smoking, tobacco, alcohol and coughing and clear the throat.^{5, 20}

Conclusion

Laryngeal dysfunction produces symptoms which can vary from mild hoarseness to life threatening stridor Laryngeal neoplasm was more than non-neoplastic lesion, and laryngeal polyp were the most of non- neoplastic lesions.

Recommendations

Early diagnosis of the lesion lead to effective management and good recovery. Early diagnosis also lead to identification of malignant in early stage and better prognosis. Standard treatment of choice should be microlaryngeal surgery for non-neoplastic, benign and early malignant, while radical surgery and radiotherapy for advanced malignant.

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