

Original Research Article

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Laryngeal cancer: a clinicopathological study of 65 cases

Jitendra Pratap Singh Chauhan, Bhartendu Bharti*, Sunil Singh Bhadouriya,
Abhay Kumar, Prem Narain, Jaypal Singh

Department of ENT, Uttar Pradesh University of Medical Sciences, Saifai, Etawah, India

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*Correspondence:

Dr. Bhartendu Bharti,

E-mail: bhartendubharti474@gmail.com

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ABSTRACT

Background: The larynx serves protective, respiratory and phonatory functions in humans. Cancer of the larynx is common cancer of head and neck region. This study was done to determine the predisposing factors, clinical aspects and histopathological pattern of the laryngeal malignancies. Patients were studied with particular significance given to the mode of presentation, risk factors, topography and histopathology of the tumour.

Methods: This prospective study was conducted at Department of Otorhinolaryngology Head and Neck Surgery, Uttar Pradesh University of Medical Sciences, Saifai, Etawah. All 65 cases of laryngeal cancer presented from July 2016 to July 2017 were included in this study.

Results: Most of cases belonged to age group 51-60 years. Tobacco intake in the form of smoking was the major risk factor and present in 80% of cases. Commonest presenting symptom was the dysphagia followed by hoarseness of voice. Supraglottic area was the commonest site (69.23%) for laryngeal cancer in this study. Squamous cell carcinoma was found in 98.46% of patients. Moderately differentiated category seen in 49.23% of patients. Most of the patients presented in the stage III and IV (30.77% and 44.62%). 37 (56.92%) cases out of 65 cases had cervical lymph node metastasis at the time of presentation.

Conclusions: Diagnosis is based on proper history, clinical examination, direct visualization of the larynx, CT scan and established by histopathological examination. This study has been done to improve comprehension and care of patients with laryngeal carcinoma.

Keywords: Larynx, Laryngeal carcinoma, Histopathological, Clinicopathological, Squamous cell carcinoma

INTRODUCTION

Head and neck region, however a relatively small anatomical area, gives rise to a wide variety of neoplastic conditions. Head and Neck cancer is a public health problem, accounting for the fifth most common of all human cancers.¹ Larynx is one of the commonest sites for carcinoma. Cancer larynx is one of the causes of morbidity and mortality worldwide and in India. Globally the incidence of laryngeal cancer was 157000 persons in 2012 which constituted 1.1% of all cancers.² The larynx is divided into the supraglottic larynx, glottic larynx and

the subglottic larynx based on the anatomical location. Laryngeal cancer, is associated with exposure to environmental toxins and chemical carcinogens, such as tobacco, alcohol, silica dust, asbestos, polycyclic aromatic hydrocarbons and therapeutic radiation.³⁻⁸ Risk of laryngeal cancer is substantially higher in people who smoke tobacco and drink alcohol. These risk factors seem to be synergistic and results in multiplicative increase in the risk of developing laryngeal cancer. Gastro oesophageal reflux disease (GERD) and nutritional deficiencies has been linked with hypo-pharyngeal and laryngeal carcinoma.⁹ Human papilloma virus (HPV) is considered as an etiological factor for laryngeal cancer.

Laryngeal squamous cell carcinoma risk is 5.4 times higher in people with HPV infection.¹⁰ Risk of laryngeal cancer is higher with HPV type 16 than HPV type 18. The vast majorities of malignant neoplasms of the larynx arise from the surface epithelium and are therefore classified as keratinizing or non-keratinizing squamous cell carcinomas.¹¹ About 95% of laryngeal carcinomas are typical squamous cell tumours. Rarely adenocarcinomas are seen to arise from larynx, presumably arising from mucous gland.¹² The prognosis for small laryngeal cancers that do not have lymph node metastases is good with high cure rates. Advanced disease has poor prognosis. Supraglottic cancers typically manifest late and unfortunately have bad prognosis. Laryngeal cancer has a high mortality rate if left without treatment. Laryngeal cancer is potentially treatable if detected early and treated properly.

Objective

The aim of the present study was to study the incidence, etiological factor, site of origin, possible spread, clinical features, and histopathological patterns and management of laryngeal carcinoma.

METHODS

Study design

This prospective study was performed on 65 cases of laryngeal cancer in the Department of Otorhinolaryngology Head and Neck Surgery, Uttar Pradesh University of Medical Sciences, Saifai, Etawah.

Study population: Inclusion and exclusion criteria

All cases of laryngeal cancer presented from July 2016 to July 2017 were included in this study except benign tumours of larynx, recurrent cases after surgery or chemo radiotherapy. Pre-designed proforma was used to record the data after obtaining an informed and written consent from all the patients included in the study.

Procedure

A detailed clinical history was taken and a note was made regarding age, sex, religion, profession, family history of cancer, nutrition, symptoms, duration of symptoms and site of growth. Addition to smoking, tobacco chewing and alcohol were also noticed very carefully. Thorough inspection of neck was done, special attention was paid to the presence of enlarged lymph nodes, size and shape of thyroid gland was noted. Careful examination of the ear, nose, nasopharynx, oral cavity, and oropharynx was done. Indirect mirror examination has been and still is the most reliable method of making a presumptive diagnosis of carcinoma of larynx and laryngopharynx were done in all patients. Routine investigations (TLC, DLC, ESR, Hb%) and blood biochemistry for urea, sugar, cholesterol, SGPT and SGOT were done in all patients.

All the patients were examined radiologically and histopathologically. Routine soft tissue x-ray of neck were taken in all patients. X-ray chest was routinely done in all cases to detect secondary, and associated pulmonary tuberculosis. CT scan of larynx from base of skull to root of neck was routinely done in all cases. Direct laryngoscopy was done in each and every case. In all patients biopsy material was taken for confirmation of diagnosis and for histological grading. In Cases presenting with nodal metastasis, FNAC was done for early diagnosis. Finally staging of carcinoma larynx according to AJCC-TNM classification was decided after proper history, clinical examination and imaging.

Ethical aspects

The study protocol was approved by Institute Ethical committee.

Statistical study

Data was collected using proforma and data collected included patients demographics. Data obtained underwent standard statistical analysis. Data were shown in number and percentages.

RESULTS

65 subjects were recruited for this study; 60 males and 5 females, with a male to female ratio of 12:1. Figure 1 is showing sex distribution.

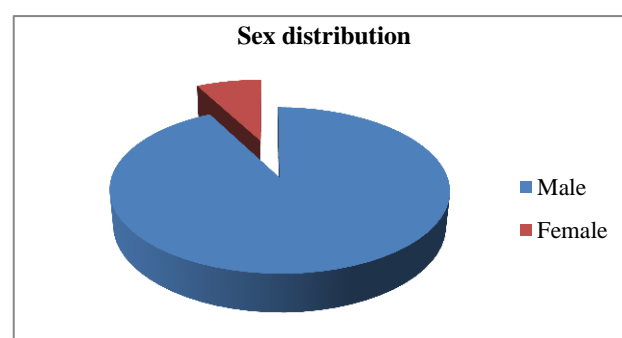


Figure 1: Sex distribution of patients.

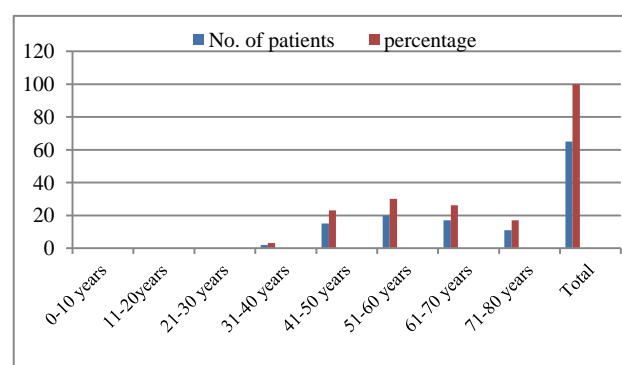


Figure 2: Age distribution of patients.

Patients mean age at presentation in present study was 58.85 ± 10.03 (SD) years with an age range of 37-81 years. Maximum number of cases belonged to age group 51-60 years. The next commonage group was 61 years and above. Figure 2 is showing age distribution of patients.

Table 1: Risk factors for laryngeal cancer.

Habit	No. of cases	Percentage (%)
Smoking	52	80
Tobacco chewing	15	23.07
Smoking and tobacco chewing	8	12.30
Alcohol	17	26.15
Betel nut/betel leaf	34	52.30
No addiction	5	7.69

Most of the patients belonged to rural areas (90%) and low socio-economic class (70%). There were 60 patients with the history of tobacco consumption in the form of cigarette, bidi and hukka. Addiction to alcohol was observed in 17 cases. In 5 patients no history of any addiction was reported. Table 1 is showing potential risk factors.

Table 2: Distribution of symptoms.

	No. of cases	Percentage (%)
Difficulty in swallowing	41	63.07
Change in voice	33	50.76
Pain in throat	19	29.23
Neck swelling	32	49.23
Difficulty in breathing	20	30.76
Pain in ear	14	21.53
Irritable cough	13	20
Loss of weight/appetite	32	49.23
Any other	12	18.46

The most common presenting symptom in our study was dysphagia (63%). Hoarseness of voice was seen in 33 cases (50.76%), neck swelling in 32 cases (49.23%), and weight loss in 49.23% cases. Table 2 is showing symptoms in patients with laryngeal cancers.

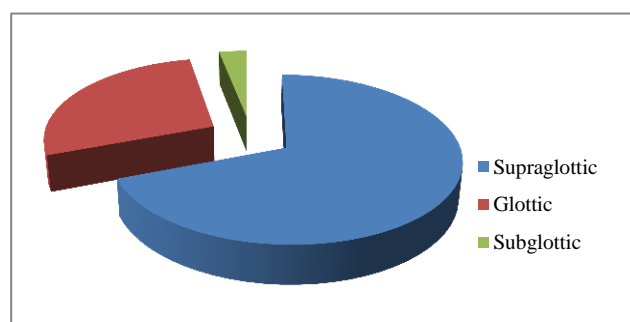


Figure 3: Topography of laryngeal cancers.

In present study 45 cases (69.23%) had supraglottis, 18 cases (27.69%) had glottic and 2 cases (3.07%) had subglottic cancer. Figure 3 is showing topography of laryngeal cancers.

CT scan was found to be cost effective and well informative for studying the larynx prior to treatment for staging. Cancer stage T1 was found in 7 cases (10.77%), T2 in 9 cases (13.84%), T3 in 20 cases (30.78%) and T4 in 29 cases (44.62%). Table 3 is showing distribution of cases in each stage.

Table 3: Distribution of cases in each stage.

Stage	No. of cases (n=65)	Percentage (%)
Stage I	7	10.77
Stage II	9	13.84
Stage III	20	30.77
Stage IV	29	44.62
Total	65	100

Presentation of neck nodes were observed as N0 in 28 cases (43.08%), N1 in 22 cases (33.85%), N2 in 6 cases (9.23%) and N3 in 9 of cases (13.85%). Among these 37 cases (56.92%) with nodal metastasis, 32 had supraglottic, 3 had glottic and 2 had subglottic malignancy. Table 4 is showing lymph node metastasis.

Table 4: Lymph node metastasis.

Site	No. of cases	N0 No	N1 No.	N2 No.	N3 No
Supraglottic	45	13	17	6	9
Glottic	18	15	3	0	0
Subglottic	2	0	2	0	0
Total	65	28	22	6	9

Cases presented with nodal metastasis (37) underwent FNAC study. On fine needle cytology report 33 cases (89%) show positive finding (i.e. metastatic carcinoma) while 4 cases (11%) were negative (i.e. Haemorrhagic smear). Table 5 is showing FNAC findings.

Table 5: Fine needle aspiration cytology findings.

FNAC findings	No. of cases	Percentage (%)
Metastatic carcinoma	33	89
Haemorrhagic smear	4	11
Total	37	100

Histopathological evaluation by punch biopsies via direct laryngoscopy revealed that Squamous cell carcinoma (SCC) was present in 64 cases (98.46%), well differentiated type in 30.77%, moderately differentiated in 49.23%, and poorly differentiated in 18.46% patients,

while adenocarcinoma found only in 1.54% patients. Table 6 is showing histopathological findings of patients.

Table 6: Histopathological findings of patients.

Histological type	No. of cases	Percentage (%)
Well differentiated squamous cell carcinoma	20	30.77
Moderately differentiated squamous cell carcinoma	32	49.23
Poorly differentiated squamous cell carcinoma	12	18.46
Adenocarcinoma	1	1.54
Total	65	100

DISCUSSION

Laryngeal carcinoma incidence varies geographically. Carcinoma of larynx is most common in adults aged 55-75 years and it is rare in children.¹³ Patients mean age at presentation in present study was 58.85 ± 10.03 (SD) years with an age range of 37-81 years. 2 cases were found below the age of 40 years. Similar results have been observed by Saedi et al (59.92 years) and Lam et al (62 years).^{14,15}

65 subjects were recruited for this study; 60 (92.31%) males and 5 (7.69%) females, with a male to female ratio of 12:1. The obvious difference seems to relate to the social habit of smoking which is rare in women in this region. Bakshi et al in their study of 690 cases of carcinoma larynx found that 647 (93.77%) patients were males and 47 (6.23%) were females.¹⁶ Goito and Fernandes in a study of 66 cases of laryngeal cancer found 64 (97%) of cases were males.¹⁷ Our results were close to the studies by Bakshi et al and Goito and Fernandes.^{16,17}

The exact etiology of laryngeal carcinoma is not well recognized, but exposure of the mucosa to a wide variety of ingested and inhaled exogenous carcinogenic agents greatly increase the risk of developing these tumors. In present study, majority of the cases belonged to low socioeconomic class of rural areas, with a strong history of tobacco use. In the present study incidence of smoking alone was found in 80% cases, 12.30% were addicted to both smoking and chewing tobacco. In this study 17 cases were alcoholic. In alcoholics the risk of hypopharynx cancer was significantly higher than the risk of larynx cancer. These observations are in accordance with the prior studies. Almadori et al, shows 95% or more have a history of smoking.¹⁸ Bakshi et al found that smoking was a predisposing factor in 87.8% of the cases and additionally or otherwise alcohol consumption was in

75% of the cases.¹⁶ Maier et al In a study of 164 cases found that smoking and drinking alcohol increase the dose-dependent risk of laryngeal cancer.¹⁹ Avoidance of smoking and alcohol could prevent laryngeal squamous cell carcinoma.

Difficulty in swallowing was the commonest symptom in 41 (63%) cases in present study. In current study change of voice especially hoarseness was the second commonest presentation (50.76%). Glottic region cancers are symptomatic at early stages as a result of hoarseness and changes in the voice. Thekdi et al reveal glottic cancer patients present with hoarseness in early stages while in late stages other symptoms like dysphagia, dyspnoea or stridor, neck swelling, loss of weight and hemoptysis.²⁰ Pain in throat was present in 29.23% cases in present study. Verma et al reported 50.95% complaining of dysphagia and 25.59% pain in throat. Swelling in neck in present study in all cases was due to secondary metastasis, found in 49.23% cases which correspond to the figure of 44.16% in Verma's study.²¹ Cervical metastasis was found to be more frequent in supraglottic than in glottic cancer. Difficulty in breathing is a late symptom and occurs when the growth has considerably increased. In this series dyspnoea was present in 30.76% of cases whereas it was present in 47.38% of cases in Verma's series and 35% cases in Deka's series.²²

In present study 27.69% had glottis, 69.23% had supraglottic and 3.07% had subglottic cancer involvement. Datti et al reported 81.5% as supraglottic, 15.5% as glottic and 3% as subglottic involvement.²³ Taskinen found that 67% had supraglottic origin. Bakshi et al. in a study of 690 cases of laryngeal malignancy found that 56% of tumours were supraglottic, 17% glottic, 3.6% subglottic and 13% transglottic tumours.¹⁶ The malignant tumours of the larynx occur more commonly in the supraglottis which is consistent with the studies of Bakshi et al and Datti et al.^{16,23}

The incidence of lymph node metastasis varies with the location of primary tumour. The high incidence of metastasis in supraglottic cancer is due to rich lymphatics supply in the supraglottic region of larynx. In present study cervical node metastasis was present in 37 (56.92%) cases at time of presentation. Highest percentage of cervical metastasis was found in supraglottic carcinoma. Out of 45 cases of supraglottic carcinoma, 32 case (71%) were present with lymph node metastasis in which 17 cases was N1 group 6 cases was N2 group and 9 cases was N3 group. Only 3 glottic cases present with lymph node metastasis. Ledermann found the incidence as follows— supraglottic 40%, glottic 3%, subglottic 13%, transglottic cancer 13%.

Patient in present study were mainly of stage of IV (44.62%) and stage III (30.77%) accounting for 71% of all cases. 9 (13.84%) patients belonged to stage II and 7

(10.77%) patients stage I. In contrast, Matsuo et al shows 60% early stage and 40% late stage.²⁴

Approximately 95% of all laryngeal and hypo pharyngeal malignant tumors are Squamous cell carcinoma. In this present series FNAC study show 89% positive finding (i.e., metastatic carcinoma). Histopathological studies in this series revealed that (98.46%) patients had squamous cell carcinoma and only 1 (1.54%) case had adeno carcinoma. Wang et al concluded that SCC accounts for 99% of all primary laryngeal carcinomas.²⁵ Suen et al stated that squamous cell carcinoma was the predominant histologic type.²⁶ Wiligen et al stated that 95% of laryngeal carcinomas were typically squamous cell carcinoma and adenocarcinoma was rarely seen.²⁷ Amongst squamous cell carcinoma the highest number of cases in this series were of moderately differentiated carcinoma (49.23%) which corresponds to findings of Lam et al and Shetty et al.^{15,28}

CONCLUSION

Laryngeal cancer should be considered a big public health problem in developing country. The symptoms of laryngeal cancer can vary from mild hoarseness of voice to life threatening stridor. All efforts should be made to diagnose laryngeal cancer as early as possible. With early diagnosis and treatment, it is possible to reduce the morbidity and mortality of this problem. Early diagnosis and treatment can improve and prolong the life of patients with laryngeal cancer.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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