

## Original Article

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# Pattern of Nodal Metastasis in Laryngeal Carcinoma

Md. Hasan Zafar<sup>1</sup>, Md. Mozharul Islam<sup>2</sup>, Md. Manjur Rahim<sup>3</sup>, Ahmmad Taous<sup>4</sup>, Md. Khalid Asad<sup>5</sup>, Md. Akhter Kamal<sup>6</sup>, Ahmed Minhaz Shumon<sup>7</sup>

### Abstract:

**Aims:** To find out the occurrence of lymph node metastasis, level of neck node involvement and the pattern of clinical presentation of patients suffering from laryngeal carcinoma.

**Methods:** A cross-sectional study on 90 cases of laryngeal carcinoma was carried out in the inpatient department of Otolaryngology- Head and neck surgery of Dhaka Medical College Hospital, Dhaka during a period of two years. Smoking and chewing betel leaf and tobacco are the most important predisposing factors.

**Results:** Most of the cases presented with more than one symptom. Change of voice was the commonest symptom. Cervical lymphadenopathy are significantly associated with supraglottic carcinoma. Level IV and level III is the commonest level of the lymph node involvement in laryngeal carcinoma.

**Keywords:** Larynx, neck node, metastasis

### Introduction:

Carcinoma larynx is not an uncommon one. It occurs more often in men than women, with a peak incidence in fifth to seventh decade of

life.<sup>1</sup> It represents worldwide approximately 1-2% of all cancers.<sup>2</sup> There is a steady rise in the incidence of cancer of larynx during the past decades<sup>3</sup>. It has been estimated that in Britain there are about 5000 new cases of head and neck cancer in each year, excluding superficial skin lesion; 30%-40% of these are laryngeal cancer.<sup>4,5</sup> In a study of Dhaka medical college hospital it was seen that 30-32% of all body cancers were in head and neck region and the commonest malignancy in the head and neck region was laryngeal carcinoma (31.58%).<sup>6,7</sup> The American cancer society estimated approximately 12,000 new cases of laryngeal cancer in USA in 1996.<sup>3</sup>

Swelling in the neck can occur as a result of either cervical lymphadenopathy or direct extension of disease through the thyroid cartilage into the lateral part of the neck.

One of the most important prognostic factors in the laryngeal cancer is the presence or

1. Assistant Professor, Dept. of ENT. Cox's Bazar Medical College, Cox's Bazar.
2. Associate Professor, Dept of ENT. Kushtia Medical College, Kushtia.
3. Assistant Professor, Dept of ENT. Kushtia Medical College, Kushtia.
4. Associate Professor, Dept of ENT. Pabna Medical college. Pabna.
5. Assistant Professor, Dept of ENT. Shaheed Syed Nazrul Islam Medical College, Kishorganj.
6. Senior Consultant, ENT. Cox's Bazar Medical College, Cox's Bazar.
7. Associate Professor, Dept. of ENT-Head-Neck Surgery. Medical College for Women & Hospital. Uttara, Dhaka.

**Address of correspondence:** Dr. Md. Hasan Zafar. Assistant Professor, Dept. Of ENT, Cox's Bazar Medical College. Cox's Bazar. E-mail: dr.hzrifat@gmail.com

absence of lymph node, along with level & size of the involved node. The supraglottis is rich in lymphatics which accounts for the high incidence of lymph node metastasis in supraglottic carcinoma.<sup>8</sup>

Our present study is intended to outline the occurrence of neck node metastasis and levels of the involved neck node in laryngeal carcinoma. The result of this study will provide some knowledge that may help in early diagnosis and choice of treatment modalities. It may have some prognostic value.

#### Aims and Objectives:

1. To find out the level of neck node involvement in laryngeal carcinoma.
2. To see the staging pattern of the carcinoma larynx at their presentation.

#### Methods:

Type of Study : Cross sectional study  
Place of study : Department of Otolaryngology- Head and Neck Surgery of Dhaka Medical College Hospital, Dhaka.

Study Population : Patients diagnosed of carcinoma Larynx during the study period who fulfill the inclusion criteria.

Period of Study : July 2005 to June 2007 (Twenty four months)

Sample Size : n=90

#### Results:

Data were collected on Laryngeal carcinoma from the inpatient department of Otolaryngology and Head & neck surgery of Dhaka Medical College Hospital, Dhaka during the period of September 2005 to April 2007. Total Number of Cases were 90. The Supraglottic region was the commonest site of laryngeal carcinoma which was seen at 60 cases (66.66%). The glottic and subglottic regions were involved in 28 (31.11%) & 2 (2.22%) cases. In this series the subglottic occurred too infrequently to be statistically significant in comparative study. So the following observation mostly showed the result of comparative study between supraglottic and glottic carcinoma in different aspects.

**Table – I**  
*Personal habit of study patients by site*

Type of habit	Supraglottic	Glottic	No. Patient	Percent
Smoking	32	19	51	57.95
Chewing betel leaf	27	05	32	36.36
Chewing tobacco	33	06	39	44.32
Alcohol	05	01	06	06.82
None	09	07	16	18.18

**Table – II**  
*Distribution of site involvement of Laryngeal carcinoma ( n = 90 )*

Site	No. of patient (n)	Percentage ( % )
Supraglottic	60	66.66
Glottic	28	31.11
Sub glottic	02	2.22
Total	90	100

**Table – III**  
Main presenting symptoms of laryngeal carcinoma (n = 90)

Symptoms	Supraglottic (n = 60)	Glottic (n = 28)	Cumulative percent
Voice change	46 (76.6%)	28(100%)	84%
Dysphagia	49(81.6%)	06(21.42%)	62.5%
Neck swelling	32 (57.3%)	11 (39.28%)	47.77%
Respiratory Distress	22 (36.06%)	08 (47%)	41.6%
Cough	05 (8.33%)	02 (7.14%)	7.77%

**Table-IV**  
Distribution of nodal involvement of patients ( n = 90 )

Neck Node status	No. of Pt. by site			Total	Percent
	Supraglottic	Glottic	Subglottic		
Node involved	32	11	00	43	47.77
Not involved	28	17	02	47	52.23
Total	60	28	02	90	100

**Table –V**  
Lymph node involvement in relations with site of Primary tumour (n = 43)

Site	Node involvement (n)	Percentage ( %)
Supraglottic	32	76.2
Glottic	11	23.8

**Table-VI**  
Distribution of level of lymph node involvement in Laryngeal carcinoma with its site. (n = 43)

Level of Lymph node	Supraglottic	Glottic	Percentage ( %)
Level II	05	00	11.63
Level III	11	05	37.28
Level IV	15	06	48.83
Level VI	01	00	2.33
Total	32	11	100

**Table-VII**  
TNM status

T- status/ N- status	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	T <sub>4</sub>	Total
No	21	17	06	03	47
N <sub>1</sub>	00	06	11	06	23
N <sub>2</sub>	00	00	07	05	12
N <sub>3</sub>	00	00	05	03	08
Total	21	23	29	17	90

**Table VIII**  
*T- Status by N- Status of the laryngeal carcinoma*

T- status/ N- status	Early Stage (T <sub>1</sub> & T <sub>2</sub> )	Advanced stage (T3&T4)	Total
Neck node negative (N <sub>0</sub> )	38	09	47
Neck node positive (N <sub>1</sub> , N <sub>2</sub> , N <sub>3</sub> )	06	37	43
Total	44	46	90

**Table IX**  
*Percent distribution of clinical TNM (cTNM) staging (n= 90)*

Stage	No. of patient	Percentage (%)
Stage I	21	23.33
Stage II	17	18.9
Stage III	23	25.55
Stage IV	29	32.22
Total	90	100

#### Discussion:

Larynx is the commonest site of head and neck malignancies.<sup>7,9,10</sup> Laryngeal carcinoma occurs in every country of the world, but varies in incidence from country to country. In this study, the age range of the patient was 30 to 71 years. The mean age was 55.99 ( $\pm$ 7.83). In this group 90% were male and 10% were female.

In this series 78.2% of the patient had habit of taking tobacco in the form of either smoking (57.95) or chewing tobacco (44.32%) with or without betel leaf (36.36). Alcohol and smoking were in 6.82% of patient. About 17.77% of the patients were free from any of this sorts of habits. It has been described in different literature that tobacco and alcohol are clearly associated and increased incidence of laryngeal carcinoma.<sup>11</sup> The effect of tobacco and alcohol have synergistic rather than additive effect.<sup>12</sup>

In this study subsite involvement of laryngeal carcinoma showed that supraglottic involvement is 66.66 % followed by the glottis

31.11% and subglottis 2.22%. It is more or less similar to the study carried out in India which showed that supraglottis, glottis and subglottis are 72.9%, 26.74% and 2.95% respectively.<sup>13</sup> But differ from western study which showed that glottic cancer was more frequent.<sup>14</sup>

In this series most of the patients (85.65%) attended with more than one symptoms. The number of symptoms were more in cases of supraglottic carcinoma than glottic carcinoma. It is supported by the result of a previous study, which revealed that supraglottictumour had significantly more symptoms than glottic tumours.<sup>15</sup>

The commonest symptom was a change in the quality of voice (84%). Although it was present in 100% cases both glottic and subglottic carcinoma, but in supraglottic carcinoma it was found in 75% cases.

In this study cervical lymphadenopathy is the third common presentation (47.77). It is similar to the study done in India which showed cervical lymphadenopathy 57.2%.<sup>16</sup> But it differs from another study done in our country which showed only 32%.<sup>17</sup> It may be due to the fact that the patients in that series was only those selected for radiotherapy. Result of the series regarding cervical lymphadenopathy completely differ a study done in USA which showed 12.4% patient of laryngeal carcinoma present with cervical lymphadenopathy.<sup>3</sup>

In our study it reveals that majority of the patients with metastatic cervical lymph node

presented themselves in an advanced ( $T_3$  &  $T_4$ ) tumour stage. On the other hand, patients had no palpable cervical lymph node mostly presented in an early ( $T_1$  &  $T_2$ ) tumour stage. But surprisingly about 19.14% (9 cases) of advanced stage patients presented themselves with no palpable neck node. It may be due to the fact that most of them were glottic carcinoma in which metastases of lymph node usually occur in very late period.

Commonest stage of lymphadenopathy in this series was  $N_1$ ,  $N_2$  and  $N_3$  were 53.48%, 27.9% and 18.6% respectively. In this series there is highly significant association between the tumour states and nodal states. The clinically positive cervical lymphadenopathy is much more common in advanced ( $T_3$  /  $T_4$ ) tumour stage ( $X^2 = 40.21$  :  $P < 0.001$ ).

Cervical lymphadenopathy was present in a much higher frequency in supraglottic carcinoma (74.42%) which is little bit higher to study done in our country that showed only 65.5% cases of supraglottic carcinoma present with cervical lymphadenopathy.<sup>18</sup>

Level of lymph node involvement in various subsites of laryngeal cancer, supraglottic and glottic carcinoma mostly involved level IV (48.83%) and level III (37.28%) respectively followed by the level II (11.63%) and level VI (2.33%). This result is similar to other previous study.<sup>8</sup> There is no such study regarding level of lymph node involvement in laryngeal carcinoma in our country.

Regarding clinical TNM staging of laryngeal carcinoma, the study revealed that most of the patients presented at advanced stage, mostly stage IV (32.22%), followed by stage III (25.55%), stage I (23.33%) and stage II (18.9%). In another study showed 35% of laryngeal carcinoma was found to have stage IV, the result similarity near to our study.<sup>19</sup>

### Conclusion:

Occurrence of Supraglottic carcinoma is more frequent than glottic carcinoma and subglottic carcinoma in laryngeal cancer.

Change in the quality of voice is the commonest presentation in glottic (100%) and subglottic (100%) carcinoma while dysphagia and neck swelling are more common in supraglottic carcinoma. Cervical lymphadenopathy is significantly associated with supraglottic carcinoma. Level IV and level III is the commonest (89.2%) level of the lymph node involvement in laryngeal carcinoma.

Smoking and tobacco chewing are the commonest predisposing factors for laryngeal carcinoma.

Majority of the cases present at an advanced stage. Extensive studies are required for better evaluation.

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