Laryngeal malignancy: relation of tumor size and neck node metastasis

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ABSTRACT

Background: Laryngeal malignancy is a common pathological entity. Size of the primary tumor and neck node metastasis both are bad prognostic features. Purpose of this retrospective study is to see if the tumor size of primary laryngeal squamous cell carcinoma correlates with the neck node metastasis.

Methods: Patients of all ages and both sex with biopsy proven squamous cell carcinoma of larynx were included in the study. After detailed history taking and clinical examination to identify the size of the primary tumor and neck node metastasis, biopsy was taken from the primary site under general anesthesia. Fine Needle Aspiration Cytology (FNAC) of the palpable neck node(s) was also performed. Data were analyzed using SPSS software for windows.

Results: Fifty seven new cases of laryngeal squamous cell carcinoma with mean age of 72.71 were included in the study. Supra glottic layrnx was the most common site affected. Neck node metastasis was more frequent in tumor of bigger size (higher T stage) and the difference was statistically significant (p=0.001).

Conclusion: The size of primary laryngeal squamous cell carcinoma correlates with the neck node metastasis. This information can be used for the therapeutic implementation as well.

Keywords: Laryngeal carcinoma; neck node metastasis; primary, squamous cell

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Background:

Head and neck malignancy ranks as the fifth most common malignancy in men (after lung, stomach, prostate, and colorectal) and the eighth most common malignancy in women (after breast, uterine cervix, colorectal, stomach, lung, ovarian and uterine corpus).[1] Laryngeal malignancy is the second most common malignancy in head and neck region worldwide.[2] There are a variety of malignant tumours arising in larynx and squamous cell carcinoma accounts for 90% of them. Incidence of laryngeal malignancy is increasing in the developing countries probably due to increase exposure of risk factors like alcohol, chewable tobacco and smoking. The prevalence increases when smoking and alcohol both are practiced concomitantly.[3]

As these lesions enlarge, they tend to spread from their primary location to the nearby regional lymph nodes in a predictable sequence. Presence of cervical lymph node metastasis is one of the most important prognostic factors in

the management of Head and Neck squamous cell carcinoma. Once the tumor involves the neck nodes, survival drops by 50%. [4]

The present study is conducted to see if the T stage of laryngeal squamous cell carcinoma (T) correlates with the neck node metastasis (N).

Methods:

This is a retrospective study carried out in the Department of ENT, Manipal Teaching Hospital, Pokhara, Nepal from 1st February 2008 to 31st January 2012. After complete history taking and clinical examination, flexible laryngoscopy was performed to assess the tumor stage. Fine Needle Aspiration Cytology (FNAC) was performed in all the patients presenting with significant palpable neck swelling at the time of presentation.

Direct laryngoscopy and biopsy was performed under general anesthesia in the operation theatre. Patients were followed up with biopsy reports. Histopathologically proven new cases of squamous cell carcinoma of larynx with or without neck node metastasis were finally included in the study. Staging of tumor was done according to Union for International Cancer Control (UICC) / American Joint committee on Cancer (AJCC) TNM stage criteria.[5, 6]

Observations were made regarding the primary site of tumor, its size and stage of the neck node metastasis. Data were analysed and results were interpreted with the help of SPSS software .

Results:

Fifty seven histopathologically confirmed new cases of laryngeal squamous cell carcinoma with or without palpable neck node metastasis at the time of presentation were included in our study. Age of the patients ranged from 40 years to 83 years with the mean age of 62.71 yrs. Forty five percent (26/57) of our patients belonged to the age range of 60-69 years (Table 1).

Table 1: No. of patients according to age range.

Age range in years	No. of patients
40-49	7
50-59	10
60-69	26
70-79	12
≥80	2
Total	57

Males accounted for 48/57(84.2%) of total patients. Male to Female ratio was 5.3:1. All of our patients were smokers and 33/57(58%) patients used to drink alcohol.

Eleven of our patients had transglottic carcinoma. Due to difficulty in locating the exact site of origin of transglottic malignancies, it was not taken into account for the sub-site comparison groups. Final comparison was made amongst 46 patients of supraglottic, glottic and subglottic subsites of the larynx.

Supraglottic larynx was the commonest subsite in 36/46 (78.2%), followed by glottis and subglottis respectively (Table 2).

Table 2: distribution of patients according to sites of primary tumor.

Primary site	Males	Females	Total
Supraglottis	30	6	36
Glottis	8	1	9
Subglottis	1	0	1
Total	39	7	46

Majority of the patients were of T3 stage 31/46 (67.4%) followed by T2 (7), T1 (6) and T4 (2) respectively (Table 3). Out of total 31 patients of T3 stage, 28 had supraglottic malignancy. Commonest nodal stage was N0 23/46 (50%) followed by N2, N1 and N3 respectively (Table 3).

Table 3: Tumor size and neck node metastasis according to site of tumor

	T	N				
		N0	N1	N2	N3	Total
Supraglottic						
	T1	1				1
	T2	3	2			5
	T3	10	7	10	1	28
	T4			2		2
Glottic						
	T1	5				5
	T2	2				2
	T3	2				2
Subglottis						
	T1					
	T2					
	T3		1			1
Total		23	10	12	1	46

Out of 36 patients of supraglottic malignancy, 22 (61%) had neck node metastasis at the time of presentation. In glottic malignancy, there was no neck node metastasis while one patient with subglottic malignancy had neck node metastasis at the time of presentation.

As the sample size was small in all groups individually, T stage was further subdivided into early T stages (T1-T2) and advanced T stages (T3-T4) and was compared with N0-N1 and N2-N3. Fisher's exact test was applied which showed the association between T and N stages to be statistically significant with the p value of 0.008 (Table 4).

Table 4: Relation of tumor size with neck node metastasis

Tumor size	N0-N1	N2- N3	Total	P value
T1-T2	13	0	13	
T3-T4	20	13	33	0.0089
Total	33	13	46	

Similarly statistical analysis was carried out amongst the T1-T2 and T3-T4 versus neck node negative and neck node positive groups. The association was again statistically significant with the p value of 0.001 (Table 5).

Table 5: Early and late T stages versus Neck node negative and positive groups

T stage	Neck node negative	Neck node positive	Total	P value
T1-T2	13	2	15	
T3-T4	10	21	31	0.001
Total	23	23	46	

Discussion:

The Tumor and Nodal stage have got a direct impact on the treatment modality, surgical outcome, and prognosis in cases of all the malignancies. In laryngeal carcinoma, neck node metastasis is common in supraglottic while there is hardly any neck metastasis in glottic carcinoma due to its anatomical characteristics. Advanced tumor stage leads to difficulty in managing a case of malignancy.

In our study, male patients predominated over the females. Male to female ratio was 5.3:1 which is in accordance with the studies done by Patel et al and Kwang Moon et al who reported the incidences as 4:1 and 5:1 respectively.[7, 8]

All the patients enrolled in our study used to smoke and 58% of patients were both smokers and alcohol consumers. This supports the well known risk factors- smoking and alcohol to be responsible for laryngeal squamous cell carcinoma. This also might explain the increased incidence of supraglottic laryngeal carcinoma observed in this study. The patients who smoke and consume alcohol concomitantly are at increased risk of developing the head and neck carcinoma.[3]

Supraglottis was the most commonly involved subsite in the larynx (78.26%) of all the cases of larynx excluding transglottic). This is in contrary to the normally accepted fact that glottic carcinoma is the most common carcinoma in larynx. Akmansu et al [9] have reported the incidence of supraglottic cancer to be 73.9%, followed by 13% transglottic and 13% glottic in laryngeal cancers in Turkish population. Similarly, Jaimanti et al in a 10 year follow up of patients suffering from carcinoma larynx, found the incidence of supraglottic carcinoma as 55.94% of all laryngeal cancers followed by glottis (17.3%), transglottic (13.04%) and subglottis (3.62%).[10] Thapa et al in a retrospective review of 8 months duration in Nepal, found that supraglottic carcinoma was commoner than glottic carcinoma.[11] It is difficult to draw a conclusion from their study due to small number of patient. However in a study done by Jukka et al in Finland from 1974 to 1995 glottic carcinoma was marginally in higher position than supraglottis.[12] This might have been due to increased use of alcohol as well as smoking. Further studies are recommended to establish the increased incidence of supraglottic carcinoma.

Distribution was also analyzed according to the T and N stage of the primary tumor. T3 was the majority in larynx. Palpable neck nodes were present in 50% of the patients presenting with carcinoma of larynx As stated earlier,22/36 (61%) patients with supraglottic malignancy had neck node metastasis but none of the patients with glottic malignancy had neck nodes.

There was a positive correlation between the T stage of the primary tumor with N stage of neck node metastasis with a p value of 0.0089. Jaimanti et al in a 10 years follow up of patients suffering from carcinoma larynx found a significant correlation between tumor size and neck node metastasis.[10] According to a study by Hicks et al, T1 andT2 disease accounted for 36% of patients, whileT3 and T4 stages accounted for 64%. Node negative patients were 57% and node positive were 43%. Comparison of T1-T2 and T3-T4 with No and N+ were statistically significant.[13] Esposito et al also found a significant difference to exist when T1+T2 and T3+T4 laryngeal cancers were compared with the neck

metastasis (P = 0.04).[14]

Pinnilla et al carried out a retrospective study on 430 patients of carcinoma larynx from 1983 to 1993 in Spain. In their study, 58% of patients were of glottic origin while 42% were of supraglottic origin. T3 stage was the most common category (36%) followed by T4 (35%), T2 (23%) and T1 (6%).There was a direct correlation of tumor size with presence of histological neck node involvement.[15] However Akmansu et al and Mat Suo et al reported no significant correlation to exist between T and N stages in laryngeal cancers.[9,16]

Conclusion:

The T stage of laryngeal carcinoma correlates with its N stage of disease in larynx. In advanced T stage, clinicians should think of metastatic spread to the neck and search for the neck node carefully for better management of the disease.

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