



ANALYSIS OF SECONDARY NECK NODES IN MALIGNANCIES OF UPPER AERODIGESTIVE TRACT

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ABSTRACT

Objectives: To study the pattern of cervical lymph node metastasis in cases of upper aero digestive tract malignancies and to determine the distribution of primary site in upper aero digestive tract in cases of cervical lymph node metastasis. **Materials and Methods:** The patient presented with neck swelling either clinically or detected during evaluation of neck in malignancies of upper aero digestive tract was enrolled in the study. Patient data collected included age, sex, detailed history regarding primary lesion and occurrence of neck swelling. Tumor characteristics evaluated included tumor site, size, histopathological grade and pattern of neck metastasis and TNM classification by clinical examination and relevant investigations. **Results:** Regional metastases were more common from tongue, supraglottis, pyriform sinus than glottis, sub glottis and post cricoid tumors. Primary tumors of increased size, moderately and poorly differentiated tumor were at higher risk for nodal metastasis. Predominance of certain levels of lymph nodes is seen for each primary site, level I,II & III were at higher risk for metastasis in cases of oral cavity carcinoma and level II, III, & IV were at higher risk for metastasis from carcinoma of the oropharynx, hypopharynx and larynx. The most common site for metastasis detected were at levels II and III and majority of the cases presented at N2 stage. There is increased risk of upper aero digestive tract malignancies as age advances and more common in males. Most of the patient reported in advanced stage of disease. Interpretation and Conclusion: These findings confirm the predominance of certain levels of lymph node group for each primary site. Data on the pattern of neck node metastasis would then provide basis for advocating limited neck dissection for patients harboring different primary tumor with limited neck disease i.e. NO and N1. As the majority of the patients presented at the advanced stage of disease, there is a increased need to bring awareness to detect disease at very early stage.

KEYWORDS

Metastasis, Neck nodes, Limited Neck dissection.

INTRODUCTION

Cervical lymphadenopathy, a common clinical problem, often presents as a diagnostic dilemma. It is imperative to establish a definite diagnosis as early in the course of evaluation as possible in order to institute a meaningful treatment. In view of rich lymphatic drainage, majority of patients with malignancies of upper aero digestive tract presents with regional dissemination of disease to cervical lymph nodes.

In the absence of detectable metastasis, cervical metastasis is currently regarded as the single most significant independent adverse prognostic factor influencing disease free and over all survival. The number of lymph nodes and the level in the neck involved and the size of the metastasis, the presence of macroscopic or microscopic extra capsular spread of the metastatic tumor and the soft tissue deposits have all been shown to influence the planning of therapy and also significantly affect the prognosis¹.

The surgical procedure employed in the management of cervical lymphnode metastasis have evolved over the years from radical neck dissection² to different type of selective neck dissections³ in recent years. Radical neck dissection offers comprehensive anatomical clearance of all cervical lymphnode groups in the neck but also causes significant complications.

The data on pattern of nodal metastasis would then provide the basis for advocating limited neck dissection and planning future prospective trials to evaluate the role of limited neck dissection in the management of carcinoma of upper aero digestive tract.

OBJECTIVES OF THE STUDY

To study the pattern of cervical lymph node metastasis in cases of upper aero digestive tract malignancies.

To determine the distribution of primary site in upper aero digestive tract in cases of cervical lymph node metastasis.

RESULTS

A total of 35 patients selected for the study out of which 27 (77%) were male and 8 (23%) were female. Age ranged between 30 years to 80 years with a mean of 54 years. Maximum cases were in 5th and 6th decade of life.

Table – 1: Distribution of primary site of origin

organ	Total case	Site of involvement	cases	Percentage of total case of organ
Oral cavity	8 (23%)	Anterior 2/3rd tongue	4	50%
		Hard palate	2	25%
		Floor of mouth	1	12.5%
		Buccal mucosa	1	12.5%
oropharynx	8 (23%)	Tonsil	3	37.5%
		Base of tongue	2	25%
		Vallecula	2	25%
		Posterior wall	1	12.5%
hypopharynx	12 (34%)	Pyriform sinus	10	83.3%
		Post cricoids	1	8.3%
		Ppw	1	8.3%
nasopharynx	2 (6%)			
larynx	5 (14%)	Supraglottic	4	80%
		transglottic	1	20%

In present study, the location of primary tumor was 23% in oral cavity and oropharynx, 34% in hypopharynx, 14% in larynx and 6% in nasopharynx.

Out of 8 patients with primary in oral cavity, 4 (50%) noted in anterior 2/3 tongue, 2 (25%) in hard palate, 1 (12.5%) each in floor of mouth and buccal mucosa.

In oropharynx, most common site of primary in descending order tonsil 37.5 %, base of tongue 25 %, vallecula 25 % and posterior wall 12.5%.

In hypo pharynx , maximum case of neck metastasis were found in PFS 83.3%, followed by PPW and post cricoid 8.3%.

The neck metastasis rates according to tumor T-staging were as follows 6% in T1, 20% in T2, 48% in T3 and 26% in T4 respectively. In present study most of the cases were in T3 and T4 stage.

Also in the study, risk of multiple neck metastasis increases as the T-stage of lesion increases and multiple neck nodes encountered more at T3 and T4 stage.

Cervical lymph node metastasis according to primary tumor cell differentiation were as follows. 14 % in well differentiated carcinoma, 43% in moderately differentiated carcinoma and 43 % in poorly differentiated carcinoma. Only squamous type of carcinoma was found even though all histological types of carcinoma aimed in our study.

When considering all patients included in the study, nodal metastasis was most frequently at level II followed by level III, level IV, level I and level V.

In oral cavity tumors, nodal involvement was highest at level II, followed by involvement at level I, level III and level IV. Isolated level IV involvement was never found. Level V and VI was not involved in any case.

In tumors of oropharynx, level II was most frequently affected followed by Level III, IV and I.

In patients with SCC of hypopharynx, majority of metastatic node were located at level II, III and level IV. Level V involvement was seen in only

DISCUSSION

The presence of cervical lymph node metastases is the most significant prognostic factor in patients with squamous cell carcinoma of the upper aero digestive tract. The 5 year survival rate in patients with neck metastasis decreases according to number and levels of the nodes involved.

PRIMARY SITE

The probability of lymphatic spread is related to the abundance of lymphatic in the given primary site.

Oral Cavity:

As many as thirty percent of the patients with oral cavity cancer are found to have lymph node metastasis on their initial evaluation with an even higher rate of nodal metastasis seen in patient with oral tongue cancer. In fact metastasis to cervical lymph node occurs more frequently from the tongue than from the other primary sites in oral cavity.

In present study, cervical lymph node metastasis is seen more in mobile tongue followed by other sites. This is in accordance with Myers E.N. et al.

Oropharynx:

It is well established that oropharyngeal carcinoma have a high probability that is upto 50% to disseminate to the neck.^{29, 30}. In a study conducted by Vartanian et al, 31 in total of 80% with oropharyngeal carcinoma, the primary tumor sites were common in tonsils, base of tongue vallecula and soft palate in decreasing order. In our present study, the commonest site of oropharyngeal carcinoma with neck metastasis was base of tongue and tonsil.

Hypopharynx:

In our study pyriform sinus is the most common primary site with cervical lymph node metastasis. This has been explained by rich lymphatic capillaries in the pyriform sinus.

Larynx:

In study conducted by Akmansu et al, neck metastasis according to tumour localization were follows 26.5% glottis and 66.7% in trans glottis.

But in our study maximum cases of primary localization is in supraglottis owing to high incidence of supraglottic malignancies than glottic ones in our country.

TUMOR STAGING

The incidence of cervical node metastasis increases sharply as the size of the primary increases. The frequency of unilateral as well as bilateral also increases with size of the primary for the same sites.

According to some authors, the tumor stage has been shown to be an independent prognostic value by itself but not by others.. A relationship of tumor stage and metastasis further explained by Di

Troria, who described that there is difficulty for the tumor to form in small caliber lymphatics of the superficial areas, compared with wider lymphatics of deeper tissue. The same was true in our study that the tumor at late stage were having more metastasis. The higher rate of metastasis was found in T3 lesions and T4 lesions i.e 48% and 26% respectively.

In presence study we have also found significant metastasis even in case of T1 and T2 lesion of oral tongue and nasopharynx this has been explained by aggressiveness of small primaries (Lindberg)⁵. The same results were shown by Robin K.T. et al. in their study on similar lines.

GRADING OF TUMOR

There is significant positive correlation between grading of tumor, perineural & perivascular invasion and periinflammatory response with cervical lymph node metastasis. Furthermore these parameters may be risk for cervical lymph node metastasis independent of T-stage. Tumors were graded by the criteria of Broders. The neoplasm were divided into well, moderate and poorly differentiated with increasing anaplasia of mesenchymal cells and increasing number of mitosis as criteria of probable aggressiveness and rapidity of the growth of the tumor.

The chance of metastasis increases as primary tumor progresses from well to moderate and then to poor differentiation.

According to our study, the primary tumor with moderate and poorly differentiated histological type associated with high risk of neck node metastasis than with well differentiated ones.

In a study conducted by Hemant et al, maximum number of tumor type are moderately differentiated. In a study by Suzuki M on clinicopathological factor showed higher chance of nodal metastasis as the degree of differentiation changes from mild to moderate and then to poor.

PATTERN OF METASTASIS

The management of metastatic cervical lymph nodes remains a surgical challenge. For decades, radical neck dissection has been considered to be the standard treatment for neck metastasis. However, due to the significant morbidity associated with the operation, questions have been raised in the past decades regarding its applicability in all patients who suffered from cancer in the head and neck region. The arguments against radical neck dissection were the associated functional disability and cosmetic deformity after operation. For these reasons, the routine use of radical neck dissection in the management of cervical lymph nodes may not be appropriate.

Modifications of the classic RND have been proposed and there was confusion regarding the various types of modifications of neck dissection.

We have identified in our study that in patients with squamous cell carcinoma of the oral cavity, the majority of metastasis lymph nodes were present at levels I, II, and III. Level-IV LN were involved only in 1 case in whom nodal metastasis also present at other levels. Pattern of nodal metastasis observed in this study supports the recommendation for supraomohyoid neck dissection (Level -I, II, III) in carcinoma of the oral cavity.

The same was described by Shah J.P and Candela F.C. that nodal involvement usually occurs at level -I, II, III in carcinoma of oral cavity.

In our study majority of the patients with primary squamous cell carcinoma of the oropharynx, hypopharynx and larynx, metastasize to level –

II, III and IV. Level –I & V were involved in few patients and also associated with nodal metastasis at other level.

This finding is well in agreement with study by Shah J.P et al⁴ and Li XM et al⁶. Thus this observation recommends lateral neck dissection i.e., level –II, III and IV for carcinoma of the oropharynx, hypopharynx and larynx. For those patient with left behind metastasis at other level post operative radiotherapy should be recommended (Byers 1985).

Functional neck dissection was initially introduced into clinical

practice by Bocca, and in recent years, this has been advocated for different types of primary carcinomas (Khaffi et al., 1999). Indeed functional neck dissection resulted in regional control rates similar to those achieved by RND,

not only in carcinoma of the larynx but also for cancers at other sites especially when patients were carefully selected (Bocca et al., 1984).

Moreover, many modifications of neck dissection have emerged in the past years and it appears that in the coming years, the role of selective neck dissection will become established as the standard treatment for squamous carcinoma of the head and neck at certain stages of the disease. Several retrospective studies from the M.D. Anderson Hospital has demonstrated that modified neck dissection is an adequate therapeutic procedure for N0 or N1 neck disease for some primary head and neck tumors. It is now believed that selective neck dissection is an oncologically sound concept.

Modification of the classic RND is based on the finding that metastatic cervical lymphadenopathy from squamous carcinoma of the upper aero

digestive tract has a predictable pattern (Sharpe, 1981; Candela et al., 1990; Shah, 1990). As long as the lymph nodes at highest risk of having metastasis are removed, the regional control rate is similar to removing all cervical lymph nodes.

NODAL LEVEL

The number of involved cervical lymph nodes correlated with an increased rate of distant metastasis and decrease prognosis. This information might be useful when planning treatment strategies that are adjuvant chemotherapy.

The number of metastasis nodes in each patient varied as shown in our study. Some patients had limited disease with metastasis nodes at a single level, and some patients had very extensive disease and metastasis lymph nodes were identified at multiple levels. However, there were no patients who had positive nodes at all five clinical levels. In present study maximum of metastasis have nodal metastasis at one level and two levels.

This is in accordance with observation by Li XM et al and Hemant et al 38.

This indicates that for appropriate chosen patients with primary squamous cell carcinoma at certain site of upper aero digestive tract, selective neck dissection might be adequate to extirpate the metastatic node.

NODAL STAGE

In general with increasing nodal size a greater degree of tumor involvement was found within the lymph node 4 and further with increase involvement of tumor degree there is increased risk of distant metastasis and decreased survival 9. Lymph node larger than 3 cm in diameter exhibits ECS in 75% cases, and ECS associates with poor prognosis.

Most of the cases presented in our study at later stage that is N2 in contrast to the study conducted by Li XM et al., Michel F et al and Kris Moe et al which showed majority of nodal metastasis at early stage i.e., N1.

This might be due to factors like high illiteracy rate, ignorance about the disease poor referral system and limited screening in our country. Further Li XM et al, advocates that selective neck dissection could be employed for clinical N0 and N1 neck while radical type of neck dissection should be performed for clinical N2 and N3 neck.

Present study also showed bilateral neck metastasis in primary tumors of nasopharynx, base of tongue, supraglottis and postcricoid.

CONCLUSION

Cervical lymph node metastasis is a critical event for patients with malignancies of upper aero digestive tract, as this is the most reliable predictor of poor treatment outcome.

We conclude that upper aero digestive tract malignancies arising in the sites which have dense lymphatic capillaries have high rate of

metastasis to the neck. Also tumor of increased size, moderately and poorly differentiated primaries have increased propensity for neck metastasis.

We found that neck levels I, II and III to be at greatest risk for nodal metastasis from primary SCC of oral cavity and levels II, III and IV are at highest risk from primaries of oropharynx, hypopharynx and larynx. Tumors locating near or crossing the midline have high risk of bilateral metastasis. The pattern of cervical lymph node metastasis observed in this study supports the recommendation for selective neck dissection as a staged procedure for N0 and N1 in patients with primaries in upper aero digestive tract

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