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Research Article

ANALYSIS OF SECONDARY NECK NODES IN MALIGNANCIES OF UPPER AERODIGESTIVE TRACT

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ABSTRACT
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. The present study is undertaken to assess the pattern of cervical lymph node metastasis and determine the distribution of their primary site in upper aero digestive tract. This is a time bound cross sectional study done on 35 patients who were attended as outpatients or inpatients in our tertiary health centre over a period of two years from November 2009 to November 2011.
Since the present study was of a descriptive design, the results were not subjected for statistical analysis. The same have been presented as percentages and graphs wherever necessary. The findings confirmed the predominance of certain levels of lymph node group for each primary site. Data on the pattern of neck node metastasis would provide the basis for advocating limited neck dissection for patients harboring different primary tumor with limited neck disease i.e. N_O and N_1.

Key Words*: Upper Aerodigestive Malignancy, Metastasis, Necknodes, Limited Neck Dissection, Neck Dissections*

INTRODUCTION
In the absence of detectable metastasis, cervical metastasis is currently regarded as the single most significant adverse prognostic factor. 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. The arguments against radical neck dissection were the associated functional disability and cosmetic deformity after operation. 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.

MATERIALS AND METHODS
This is a time bound cross sectional study done on 35cases at Chigateri General Hospital, Bapuji Hospital and teaching hospitals attached to J.J.M. Medical College, Davangere over a period of two years from November 2009 to November 2011.
The patients presented with neck swelling either clinically or detected during evaluation of neck in malignancies of upper aero digestive tract were enrolled in the study. A pre designed proforma was used to record relevant information like patient data, history, clinical findings and investigation report from individual cases. A detailed history regarding primary lesion and occurrence of swelling in the neck was assessed. A detailed local examination of neck for metastatic neck node was done for its site, size, number and its apparent relation to surrounding structure.
An examination of upper aero digestive tract was done to detect primary lesion and investigation like nasopharyngoscopy, barium swallow and upper GI endoscopy was done to detect the primary lesion. FNAC for neck node and biopsy of primary lesion was done for histopathological confirmation and to classify primary tumor based on grades of differentiation into well, moderate and poor. Ultrasound of

neck was done to determine the lymph node metastasis in the neck, its site, number, size and internal architecture.

All the malignancies of upper aero digestive tract were staged according to American Joint Committee on Cancer (AJCC/UICC 2002 TNM classification).

Inclusion Criteria

Patients of neck metastasis with primaries in the upper aero digestive tract.

Exclusion Criteria

- Occult primary tumor with neck metastasis.
- Where primary is not confined to upper aero digestive tract i.e., abdomen, thyroid etc.
- Those patients who are already undergone treatment i.e., radiotherapy or chemotherapy or neck dissection.

In the present study, primary tumor characteristics like site of occurrence of primary, T-staging and histological types were assessed with respect to lymph node metastasis. Further, analysis of nodal metastasis was done with reference to pattern of distribution, nodal staging and level of nodal involvement.

Tumors were graded by the criteria of Broaders. 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.

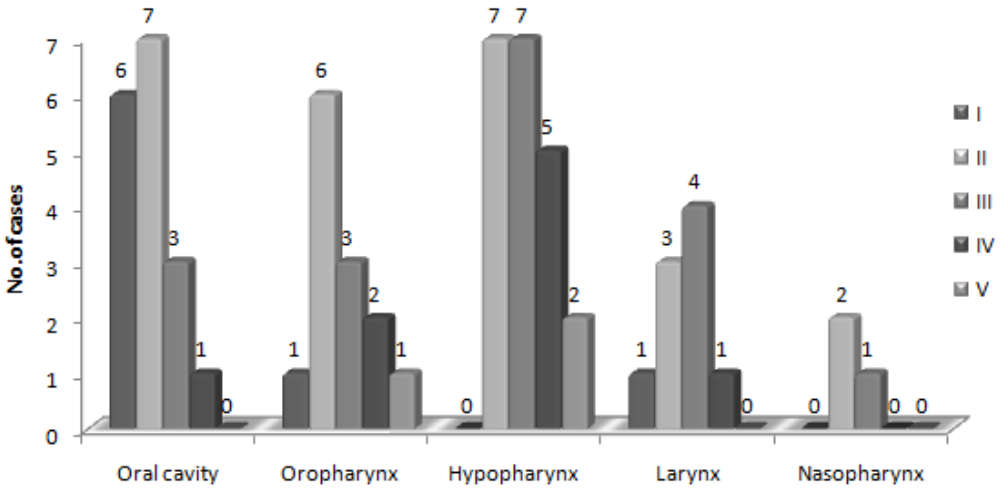
RESULTS

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

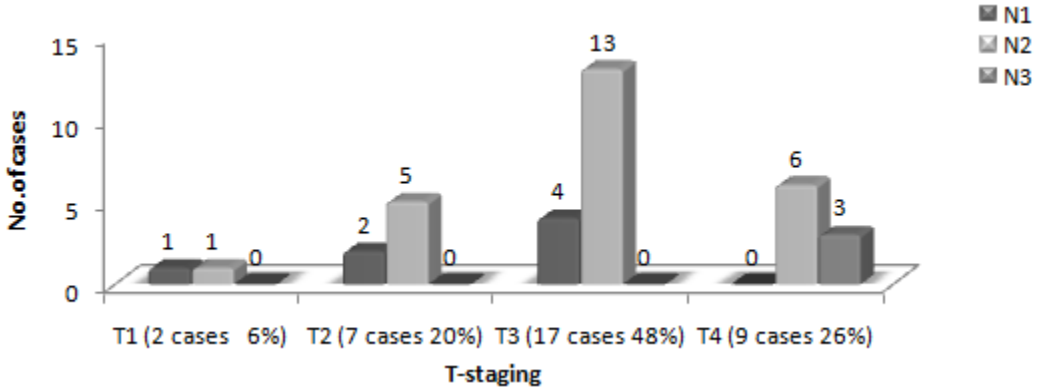
Table 1: Distribution of primary site of origin

Origin	Total cases	Site of involvement	Cases	Percentage of total case of origin
Hypopharynx	12 (34%)	Pyriform sinus	10	83.3%
		Post cricoid	1	8.3%
		PPW*	1	8.3%
Oral cavity	8 (23%)	Anterior 2/3 tongue	4	50%
		Hard palate	2	25%
		Floor of the 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%
Larynx	5 (14%)	Supraglottic	4	80%
		Transglottic	1	20%
Nasopharynx	2 (6%)			

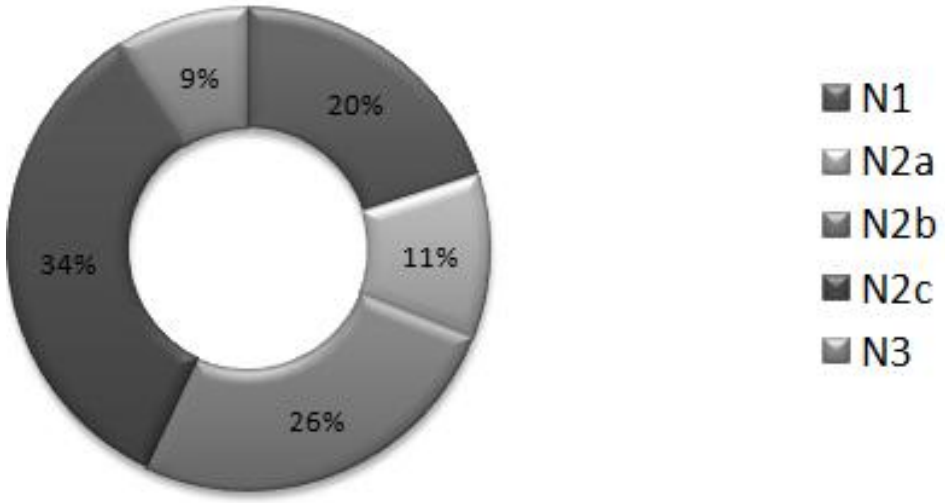
**PPW: Posterior Pharyngeal Wall*



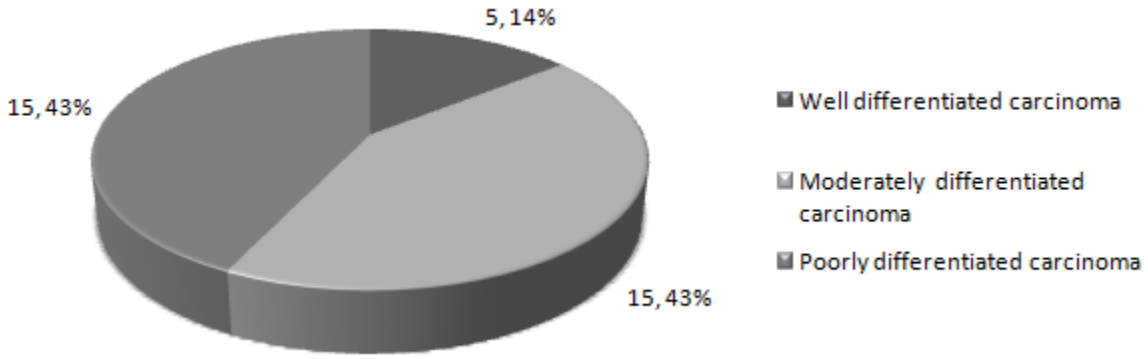
Graph 1: Distribution of metastatic notes at level I through V in relation to primary tumour



Graph 2: Neck metastasis rates according to tumour T staging



Graph 3: Distribution of nodes at various clinical N stages



Graph 4: Distribution of neck metastasis according to grading of tumor

Only squamous type of carcinoma was found even though all histological types of carcinoma were aimed at our study.

DISCUSSION

The presence of cervical lymph node metastasis 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.

1. Primary Site

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

1.1 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 (Robins, 2000).

In present study, cervical lymph node metastasis is seen more in mobile tongue followed by other sites. This is in accordance with Sano and Myers *et al.*, (2007)

1.2. Oropharynx

It is well established that oropharyngeal carcinoma have a high probability that is upto 50% to disseminate to the neck. In our present study, the commonest site of oropharyngeal carcinoma with neck metastasis was base of tongue and tonsil. In a study conducted by Vartanian *et al.*, (2003) 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.

1.3. 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.

1.4. Larynx

In our study maximum cases of primary localization is in supraglottis owing to high incidence of supraglottic malignancies than glottic ones in our country. In study conducted by Akmansu *et al.*, (1999) neck metastasis according to tumour localization was follows 26.5% glottis and 66.7% in trans glottis.

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.

A relationship of tumor stage and metastasis further explained by Di Troria, (1972), 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 the present 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. The same results were shown by Robin *et al.,* (2000) 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 (Suzuki *et al.,* 2009).

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 Chopra *et al.,* (1995) maximum number of tumor type is moderately differentiated. In a study by Suzuki *et al.,* (2009) 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

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, 1990 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 *et al.,* (1990) and Li *et al.,* (1996). Thus this observation recommends lateral neck dissection i.e., level –II, III and IV for carcinoma of the oropharynx, hypopharynx and larynx. For those patients with left behind metastasis at other level post operative radiotherapy should be recommended.

Functional neck dissection results 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. 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 (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 metastastatic nodes in each patient varied in our study. Some patients had limited disease with metastastatic nodes at a single level, and some patients had very extensive disease and metastastatic 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 *et al.,* (1996) and Chopra *et al.,* (1995). 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 extirprise the metastatic node.

Nodal Stage

In general with increasing nodal size a greater degree of tumor involvement was found within the lymph node (Shah, 1990) and further with increase involvement of tumor degree there is increased risk of distant metastasis and decreased survival. 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 *et al.*, (1996) 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 *et al.*, (1996) advocates that selective neck dissection could be employed for clinical N0 and N1 neck while radical type of neck dissection should be perform 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 predicator 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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