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To Study the Lymphatic Metastatic Patterns in Oral Cavity Malignancies at M.Y. Hospital & MGM Medical College, Indore

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Abstract: The management of the cervical lymph nodes is an integral part of the overall treatment of the oral cavity malignancies. The indications and uses of the various types of neck dissections and pre and postoperative radiotherapy has been a subject of much debate. Based on the results of the present study and the literature available with us, we can conclude that, Dissemination of metastatic cancer to regional lymph nodes from primary sites in the upper aerodigestive tract occurs in a predictable and sequential pattern. For primary tumours in the oral cavity, the regional lymph nodes at the highest risk for early dissemination by metastatic cancer (first echelon nodes) are limited to levels 1,2 and 3, i.e., within the supraomohyoid triangle of neck. Skip metastasis to levels 4 and 5 in the absence of metastasis at levels 1,2 or 3 is very rare.

Keywords: Lymphatic Metastatic, Oral Cavity & Malignancy.

INTRODUCTION

Cancers in the head and neck region commonly metastasize to cervical lymph nodes. The term "neck dissection" refers to a surgical procedure in which the fibro fatty contents of the neck are removed for the treatment of cervical lymphatic metastases. Neck dissection is most commonly used in the management of cancers of the upper aero digestive tract. It is also used for malignancies of the skin of the head and neck area, the thyroid, and the salivary glands [1].

The lymphatic drainage of the mucosal surfaces and other tissues of the head and neck is directed to the lymph nodes located within the fibro adipose tissue that lies between the investing (superficial) layer of the deep fascia superficially and the visceral and prevertebral layers underneath. In this space, these lymph nodes tend to be aggregated around certain neural and vascular structures such as the internal jugular vein, spinal accessory nerve, and transverse cervical artery[2].

Selective neck dissection for oral cavity cancer

Selective removal of the level I, II, and III lymph nodes is the surgical procedure of choice for management of N0 and N1 disease that originates from cancers of the oral cavity as shown below; however, because of the lymphatic drainage of the oral tongue, some authorities advocate selective neck dissection (I-IV) for cancers that originate from this sub site[5]. The operation includes the resection of soft tissue in the sub mental triangle, along with the sub mandibular triangle contents, including the submandibular gland and the fibrofatty tissue along the internal jugular vein from the skull base to the omohyoid muscle (or clavicle). The dissected contents include the fascia that covers the medial aspect of the stern mastoid muscle; the muscle itself is laterally retracted and preserved. These neck contents are peeled off from the internal jugular vein and from around the accessory nerve, sparing these structures.

MATERIALS AND METHODS

The material for the present study considered of 52 cases of carcinoma of oral cavity registered with the MGM Medical College, Hospital and Research Centre, Indore, between January 2016 to July 2017. All the patients had undergone surgical treatment for their primary lesion with cervical lymph node dissection, either radical neck dissection or selective neck dissection with or without radiotherapy. After completion of the treatment, all were followed up and the results were studied.

In all the cases, the various points were noted and recorded, from the time of admission till complete follow up, in the proforma prepared for the same (vide appendix). A thorough history of the complaints was taken at the onset. A history of any significant past illness was recorded. Particular attention was given to the personal history, with history of tobacco intake, smoking or alcohol addiction

recorded. Thorough examination of all the patients was done including general examination and local examination of the oral cavity and the neck nodes. Any ulcer or swelling was examined thoroughly with all the points noted and recorded as in the proforma, including the size of the lesions, their exact location, edges etc. The cervical lymph nodes were examined thoroughly bilaterally. Any palpable lymph node was noted in the proforma under appropriate level. Thorough search was done to detect any metastasis, by clinical examination and relevant investigations. Patient's was categorized as per the TNM classification and treatment was given, as deemed appropriate.

After the completion of treatment, including any radiotherapy (if given), the patients were followed up. At each visit, the complaints were recorded and local examination was done to look for any locoregional recurrence. Detailed clinical examination was done to detect any metastasis.

At the end of it, the patients were grouped according to the clinical staging, their lymph node status, the treatment they received for their cervical nodes and whether they received radiotherapy or not. The results were recorded and studied in various groups.

STATISTICAL ANALYSIS

The results are presented in percentages. The Chi-square test was used for comparisons. The p-value<0.05 was considered significant. All the analysis was carried out on SPSS 16.0 version (Chicago, Inc., USA).

OBSERVATIONSAND RESULTS

The present work was carried out to have a comparative study between selective lymph node dissection and radical lymph node dissection in cases of oral cavity malignancies. The subjects were studied from Jan 2016 to July 2017. The following were the observations:-

Table-01: Patterns of neck nodal metastasis

Primary site	First echelon nodes
Oral cavity	Levels I, II, III
Larynx, Pharynx	Levels II, III, IV
Thyroid	Levels IV, VI, superior mediastinal
Parotid	Levels II, III, Pre-auricular, Peri & intra parotid, Upper accessory chain
Submandibular, sublingual glands	Level I, II, III

The risk of nodal metastases is dependent on various factors related to the primary tumor. These include the site, size (large or small), T stage, location of the primary tumor (within an organ such as the vocal cord compared with supraglottis) and histomorphology of the primary tumor. The risk of metastases increases as one progresses from the anterior to posterior part of the upper aero-digestive tract; from lip (10%) progressing along the tongue (25%), gum (30%), floor of mouth (40%), oropharynx (55%) to hypopharynx (65%). Endophytic tumors, poorly differentiated tumors, and tumors with a greater thickness (tongue and floor of mouth) are more likely to have metastases [4].

Table-02: Distribution of patients according to the level of nodal group involvement

	No. of patients		SOH+RT		SOH Only		RND+R T		RND Only		p-value[1]
	No.	%	No.	%	No.	%	No.	%	No.	%	
No clinically Positive nodes	12	23.1	0	0.0	11	91.7	0	0.0	0	0.0	0.0001*
Level 1 Only	27	51.9	16	59.3	5	18.5	5	18.5	2	7.4	
Level 1+2	13	25.0	1	7.7	1	7.7	9	69.2	2	15.4	

[1]Chi-square test

Table-2 shows the distribution of patients according to level of nodal group involvement. Overall, level 1 only was observed in 51.9% patients and level 1+2 was in 25%. Level 1+2 was found to be in 69.2 in RND+RT group. Level 1 only was in 59.3% in SOH+RT group. There was significant (p=0.0001) difference in the level of nodal group involvement among the groups.

Table-03: Distribution of patients according to the level of nodal group involvement

	No. of patients		SOH+RT		SOH Only		RND+RT		RND Only		p-value[1]
	No.	%	No.	%	No.	%	No.	%	No.	%	
No clinically Positive nodes	12	23.1	0	0.0	11	91.7	0	0.0	0	0.0	0.0001*
Level 1 Only	27	51.9	16	59.3	5	18.5	5	18.5	2	7.4	
Level 1+2	13	25.0	1	7.7	1	7.7	9	69.2	2	15.4	

[1]Chi-square test

Table-3 shows the distribution of patients according to level of nodal group involvement. Overall, level 1 only was observed in 51.9% patients and level 1+2 was in 25%. Level 1+2 was found to be in 69.2 in RND+RT group. Level 1 only was in 59.3% in SOH+RT group. There was significant (p=0.0001) difference in the level of nodal group involvement among the groups.

Carcinoma of the oral cavity is one of the commonest cancers in India. comprising about 35% of all cancers in men and about 18% of all cancers in women. Men are affected more commonly than women (1.5-2 times). In our study, out of 52 cases, 40 were males and 12 females (3.33:1). The single most important prognostic factor in the treatment of patients with oral malignancies is the status of cervical lymph nodes. Thus, the management of cervical lymph nodes is a vitally important component of the overall treatment strategy for patients with oral cavity malignancy [6].

DISCUSSION

Distribution of cases

In this study, out of 52 cases, 18 were of Ca- buccal mucosa (34.61%), 16 were of Ca- alveolus (30.76%), 15 were of Ca- tongue (28.84%) and 3 were affected with Ca- lip (5.76%).

As reported by Rao D.N. and Ganesh B, the incidence of various forms of oral cavity cancers in India are:- Ca buccal mucosa – 38%, Ca tongue – 16% , Ca alveolus – 15.7% and Ca lip – 7% [Current trends in the management of Head and neck cancer, Mumbai, TMH, pp- 10, 1998][7].

Pattern of cervical metastasis

Dissemination of metastatic cancer to regional lymph nodes from Primary sites in the upper aerodigestive tract occurs in a predictable and sequential fashion. Thus, all regional lymph node groups are usually not at risk of nodal metastasis initially from any primary site in the absence of grossly palpable metastatic lymph nodes.

For primary tumours in the oral cavity, the regional lymph nodes at highest risk for early dissemination by metastatic cancer are limited to levels 1, 2 and 3. Anatomically, this translates into regional lymph node groups, contained within the supraomohyoid triangle of the neck. Skip metastasis to levels 4 and 5 in the absence of metastatic disease at levels 1,2 or 3 is very rare.

In our study, 28 patients (53.84%) had only level 1 involvement; whereas 13 patients (25%) had involvement of both level 1 and 2 nodal groups. 11 patients (21.15%) had no nodal involvement clinically. None of the patients had involvement of level 3 nodes or beyond on clinical examination and none of the patients had involvement of level 2 nodes without the involvement of level 1 node.

Shah, who had reviewed 1119 cases of radical neck dissection at Memorial Sloan Kettering Cancer Centre, had reported that only 1.5% of patients with clinically negative neck and pathologically proven nodal metastasis had involvement of level 5 nodes where as 5.3% of patients with clinically positive neck and pathologically proven metastasis had level 5 involvements [3, 4]. Also, none of the patients with carcinoma of tongue, retromolar trigone or buccal mucosa had level 5 nodal involvements. The incidence of various nodal involvements was as follows:-

Table-04: Percentage of nodal involvement

	Percentage of nodal involvement					
Primary site	1a	1b	2	3	4	5
Oral Tongue	3.3aaa	22.8	59.7	10.7	2.6	7.0
	9.0b	18.0	73.0	18.0	--	--
	--c	14.0	19.0	16.0	3.0	--
Floor of Mouth	4.3a	43.1	37.1	9.5	4.3	1.7
	7.0b	64.0	43.0	--	--	--
	--c	16.0	12.0	7.0	2.0	--
Buccal Mucosa	--a	--	--	--	--	--
	--b	--	--	--	--	--
	--c	44.0	11.0	--	--	--
Lower gum	--a	--	--	--	--	--
	--b	60.0	40.0	--	--	--
	--c	27.0	21.0	6.0	4.0	2.0
Retromolar Trigone	0.6a	17.1	61.8	16.4	3.3	0.6
	--b	25.0	63.0	12.5	--	--
	--c	19.0	12.0	6.0	6.0	--

a = Based on clinical examination
b = Based on examination of selective neck dissection
c = Based on examination of radical neck dissection

In our study, only clinical examination of the nodes was considered and the pathological involvement, either preoperative or post- operative examination was not taken into account. There are several factors to be considered regarding nodal staging of the patients in this study:-

- The sensitivity of clinical examination in picking up positive nodes is 60-70% and varies from person to person.
- Body habitus influences the ability to detect metastasis.
- About one third of the nodes which are clinically positive are found to be pathologically negative and vice versa.
- The histological status of the nodes was not available for this study, neither was any extracapsular spread considered.

Regarding nodal stages, 11 patients had N0 disease, 16 had N1 disease, 9 had N2a disease, 10 were staged N2b, 1 had N2c and 4 patient had N3 disease.

Thus, the majority of patients presented at an advanced stage of the disease with nodal metastasis. There was no significant ($p=0.55$) difference in the nodal status among the groups ($p>0.05$).

CONCLUSION

To conclude, the management of the cervical nodes should be highly individualized and cafeteria approach should be offered to the patients, explaining the risks and benefits of the various procedures. Selective neck dissection, when used in combination with postoperative radiotherapy, is an efficacious way to manage metastatic squamous cell carcinoma of the neck in early nodal disease (N0, N1 and N2a) and is being considered for more and more patients, with good results. For N2b disease and beyond Radical neck dissection with post-operative radiotherapy gives best loco-regional control. More studies need to be done with larger data base and multivariate analysis to formulate comprehensive guidelines for the management of neck in cases of oral cavity cancers, so as to have the best results with least morbidity.

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