



CORRELATION OF CERVICAL LYMPHADENOPATHY OF MAXILLOFACIAL REGION IN CHILDREN AND ADULTS

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ABSTRACT:

Background: Cervical lymphadenopathy is a common clinical condition in children and adults. It may be primary regional lymphadenopathy but mostly it may be secondary to either infective lesion in areas that drain to neck or due to metastasis from the malignant lesions of the areas which drain into cervical lymphnodes of different levels.

Objectives: This study was performed to evaluate the clinical behavior, management and outcome of cervical lymphnodes and to determine the distribution of primary site in upper aero digestive tract in cases of cervical lymph node metastasis.

Methods: Patients visiting the Dental OPD and/or admitted in the Surgical IPD for Cervical Lymphadenopathy during September 2018 to December 2018, was taken up for study with the help of relevant history, thorough case history of intraoral and extraoral maxillofacial region. Appropriate investigations including FNAC (Fine Needle Aspiration Cytology), Ultrasound of the neck, endoscopy etc. was performed for each patient.

Results: Out of 80 cases presenting with cervical lymphadenopathy, causes found to be periodontitis, pericoronitis, third molar impaction, osteomyelitis and other oropharyngeal infections. 29 of the patients presented at stage IVA i.e., 72.5%, 4 cases at stage III i.e., 10%, 2 cases at stage IVB i.e., 5%. Remaining out of 5 cases, 3 cases were CAT-I i.e., 7.5%, 2 cases were stage IA and IIIB of Hodgkin's and Non-Hodgkin's lymphoma respectively i.e., 5%.

Conclusion: By this study it is evident that there is clear pattern of relationship between intra and extraoral organ-specific drainage and incidence of cervical metastasis in children as well as adult population.

This study helps in planning and dealing occult metastasis tumors and other lesions of oral cavity, pharynx by following lymphnodes for the corresponding primary sites.

Keywords: Lymph Nodes, Cervical Lymphadenopathy, Endoscopy, FNAC, Ultrasound.

Introduction

Cervical lymphadenopathy, a common clinical problem, often presents as a diagnostic dilemma. It is crucial 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 oral cavity has a wide

area of drainage and this is important because there is often free communication between the two sides of tongue. The posterior parts of the oral cavity drain either directly into the upper deep cervical nodes or indirectly via the submandibular nodes in level I. More anterior parts of the oral cavity also drain to these nodes but in addition it may drain to the submental. Contra lateral neck spread may occur early in those tumors situated in or near the midline.

Lymphatic drainage from the tip of the tongue drains to the sub mental nodes and to the nodes in the deep jugular cervical chain. The sublingual portion of the tongue usually drains to the sub mandibular nodes and the rest of anterior one third of tongue drains to the deep jugular chain from the level of posterior belly of digastric to the omohyoid (level II).

In the absence of detectable metastasis, cervical metastasis is currently regarded as the single most significant independent adverse prognostic factor influencing disease free and overall 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 prognosis.³ The surgical procedure employed in the management of cervical lymphnodes metastasis have evolved over the years from radical neck dissection⁴ to different types of selective neck dissections⁵ in recent years. Radical neck dissection offers comprehensive anatomical clearance of all cervical lymphnodes 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.

Cervical lymphadenopathy could be an external manifestation of underlying severe and significant disease. Tumors in the oral cavity and pharynx have a higher incidence of metastatic disease at presentation. It could be only presenting symptom of an underlying severe disease. Any form of affections of cervical lymphadenopathy should not be ignored and should be considered as a strong and significant clinical input which ultimately leads to detection of several clinically silent diseases. It helps in early diagnosis, early treatment and good prognosis.^{8,9}

This study was performed to evaluate the clinical behavior, management and outcome of cervical lymphnodes and to determine the distribution of

primary site in maxillofacial region and upper aero digestive tract in cases of cervical lymph node metastasis.

MATERIALS AND METHODS

This study was conducted on the patients visiting the Dental OPD and/or admitted in the Surgical IPD for Cervical Lymphadenopathy during September 2018 to December 2018 by the Oral and Maxillofacial Surgeon and Paediatric Surgeon, for evaluation at Sri Shankaracharya Institute of Medical Sciences, Bhilai. The patients included were of in between 0-60 year of age group. Four age groups were created as 0-10 years, 11-20 years, 21-40 years and 41-60 years.

Written informed consent was taken from each patient and parent of minor. A pre designed Performa was used to record relevant information like patient data, history, clinical findings and investigation report from individual cases. Detail local intra and extraoral examination of neck for organ-specific drainage, neck node was done for its site, size, number and its apparent relation to surrounding structure. A detailed examination of ear, nose and throat was done to detect primary lesion and investigations like endoscopy, FNAC, Ultrasound, etc.

Inclusion Criteria: Cases of cervical lymphadenopathy, with or without previous history of any medical or surgical treatment for the same and cases which were regular for post treatment follow-up.

Exclusion Criteria: Cases which did not come for regular follow-up and who did not complete or receive any medical or surgical treatment.

Statistical analysis was performed by using MS Excel-2010 and SPSS software trial version 21.0

RESULTS

This study consisted of total 80 patients, out of which 32 were female i.e., 40% and 48 were males i.e., 60%. All demographic variables like age, gender, socioeconomic status were enumerated. (Table 1)

In the present study, patients in the age group of 0-10 years are 24 i.e., 30% of cases, 16 in the age group of 11-20 years i.e., 20% and the remaining 20 in the age group of 21-40 years i.e., 27.5% and

22.5% in more than 40 years of age. (Table 1) Majority of the patients in our study were 36(45%) low economic social status, 26(32.5%) middle class and remaining 18(22.5%) higher middle class. 40% Patients were presented with dysphasia. 42.25% Patients complained of Dyspnoea. (Table 2)

46 cases presented with single sided cervical lymphadenopathy and 24 cases with bilateral cervical lymphadenopathy cases, which accounts to 55.25% and 30% respectively.(table 2) 20 cases were firm, 10 cases were hard and 4 cases were matted in appearance whose percentage were 25%, 12.5% and 5% respectively.(table 2) Lymph nodes were mobile in 68 cases i.e., 85% and fixed or indurated lymphadenopathy was seen in 12 cases i.e., 15%. (Table 2)

Other clinical findings were found to be periodontitis mostly in old age patients, pericoronitis associated with third molar in young patients. Pericoronitis was commonly seen in lower jaw due to lack of space for the growth of third molar and triangle of buccal, massetric and pharyngeal space. 24 cases i.e. 30% cases showed multiple ulcerations. (Table 2)

Distribution of Neck Metastasis according to Grading of Tumor, in which 9 cases were well differentiated i.e., 22.5%, 22 cases were moderately differentiated i.e., 62.5%, 1 case is poorly differentiated i.e., 2.5% as shown in table 12. T- Stage distribution, 16 (45.7%) cases in T2, 17 (48.6%) cases in T3 and 2 (5.7%) cases in T4

respectively and 5 cases not included in TNM staging. In present study most of the cases were in T3 stage. (Table 13) N-stage Distribution, 5 (14.3%) cases in N1, 1 (2.8%) case in N2a, 12 (34.2%) cases in N2b, 15 (42.9%) cases in N2c and 2 (5.7%) cases in N3. Remaining 5 cases were not included in TNM staging. (Table 3)

Biopsy reports were consistent with FNAC reports in our study. Accuracy of FNAC in respect to biopsy is statistically significant in our study. Out of 40 cases presenting with cervical lymphadenopathy, 29 of the patients presented at stage IVA i.e., 72.5%, 4 cases at stage III i.e., 10%, 2 cases at stage IVB i.e., 5%. Remaining out of 5 cases, 3 cases were CAT-I i.e., 7.5%, 2 cases were stage IA and IIIB of Hodgkin’s and Non-Hodgkin’s lymphoma respectively i.e., 5%. All the primary lesions diagnosed as Squamous Cell carcinoma on Histopathology report received Radiotherapy and Chemotherapy treatment. Tuberculous lymphadenitis was treated with Anti-Tuberculous treatment. Hodgkin’s and Non-Hodgkin’s Lymphoma was treated with chemotherapy.(Table 3) Out of 40 cases presenting with cervical lymphadenopathy, 29 of the patients presented at stage IVA i.e., 72.5%, 4 cases at stage III i.e., 10%, 2 cases at stage IVB i.e., 5%. Remaining out of 5 cases, 3 cases were CAT-I i.e., 7.5%, 2 cases were stage IA and IIIB of Hodgkin’s and Non-Hodgkin’s lymphoma respectively i.e., 5%

Table 1: Demographic variables (n=80)

Demographic variables	Group	Number of patients	%
Gender	Male	48	60
	Female	32	40
Age group (years)	0-10	24	30
	11-20	16	20
	21-40	22	27.5
	41-60	18	22.5
	Social status	Low economy	36
	Middle class	26	32.5
	Higher middle class	18	22.5

Table 2: Clinical findings presented by the patient.

Clinical findings	Details	Number	%
Temperature	Raised	64	80
	Normal	16	20
Swelling	Present	80	100
	Absent	0	0
Nodes involved	Single	56	70
	Multiple	21	30
	Unilateral	46	55.25
	Bilateral	24	30
Pain	Present	68	85
	Absent	12	15
Dysphagia	Present	32	40
	Absent	48	60
Dyspnoea	Present	34	42.25
	Absent	46	55.25
Consistency	Soft	36	45
	Firm	20	25
	Hard	10	12.5
	Matted	4	5
Mobility	Fixed or indurated	12	15
	Mobile	68	85
Periodontitis	Upper jaw	20	25
	Lower jaw	36	45
Third molar pericoronitis	Upper jaw	0	0
	Lower jaw	32	40
Oral ulcers	Present	24	30
	Absent	56	70

Table 3: pathologies related to cervical lymphadenopathy

Histopathology	Consistency of Lymph nodes			p value
	Firm	Firm and matted	hard	
Well Diff Squamous Cell Carcinoma	4	0	5	0
Moderately Diff Squamous Cell Carcinoma	15	0	10	
Poorly Diff Squamous Cell Carcinoma	1	0	0	
HL-Lymphocyte Rich Variant	0	0	1	
Non Hodgkins Lymphoma- Dlbcl	1	0	0	
Tuberculosis	1	2	0	

DISCUSSION

The major presenting symptoms of the patients in this study were primary growth, neck swellings, dysphasia, dyspnoea, change in voice and other symptoms being trismus, burning sensation in oral cavity and pain in the oral cavity, referred nostalgia and fever.

In this study, most common level of lymph nodes involved on Left side is Level-II followed by Level-IB and Level-III. Level of lymph nodes most commonly involved on Right side is Level-II followed by Level-IB.

Consistency of lymph nodes: 22(55%) cases are firm, 16(40%) cases are hard and 2(5%) cases were firm and matted in appearance. Mobility of lymph nodes in our study was mobile in 31 cases i.e., 77.5% and fixed in 9 cases i.e., 22.5%.

Cervical lymph node metastases according to primary site differentiation are as follows: 9 cases were Well Differentiated Squamous Cell Carcinoma i.e., 22.5%, 25 cases are Moderately Differentiated Squamous Cell Carcinoma i.e., 62.5%, 1 case is Poorly Differentiated Squamous Cell Carcinoma i.e., 2.5%. In this study incidentally all the Histopathology reports found to be Squamous Cell Carcinoma even though all histological types of carcinoma were aimed in our study. In a similar study conducted by Hemant et al³⁵, maximum number of tumor type are Moderately Differentiated. Remaining cases were 3 of tuberculous lymphadenitis i.e., 7.5%, 1 of Hodgkin's Lymphoma i.e. 2.5% and 1 of Non-Hodgkin's Lymphoma i.e., 2.5%.

As per TNM staging system, in this study following observations were made regarding the tumor size and "T" staging is 40% in T2, 42.5% in T3 and 5% in T4 respectively and remaining 5 cases i.e., 12.5% were not included in TNM staging. In present study most of the cases were in T3 stage.

As per TNM staging system, in this study following observations were made regarding the node size and "N" staging is 12.5% in N1, 2.5% in N2a, 30% in N2b, 37.5% in N2c and 5% in N3. Remaining 5 cases i.e., 12.5% were not included in TNM staging. Most of the cases presented in our study at a later stage that is N2 in contrast to the study conducted by Li XM et al.,

Michel F et al³⁶ and Kris Moe et al³⁷ which showed majority of nodal metastasis at early stage i.e., N1.

In this study, out of 40 cases presenting with cervical lymphadenopathy, 29 patients presented at stage IVA i.e., 72.5%, 2 cases at stage IV i.e., 5%, 4 cases at stage III i.e., 10%. Remaining out of 5 cases, 3 cases were CAT-I i.e., 7.5%, 2 cases were stage IA and IIIB of Hodgkin's and Non-Hodgkin's lymphoma respectively i.e., 5%.

All the 40 cases were subjected to FNAC, 3 cases were tuberculous lymphadenitis, 2 cases were Hodgkin's Lymphoma and Non-Hodgkin's Lymphoma one each and the remaining 35 cases were secondary metastases. The clinical diagnosis made among 40 cases of this study was consistent with FNAC result. The diagnostic accuracy of FNAC in our study was comparable to study of Debra R et al³⁸ and Sarada A.K et al³⁹ (100%).

Oral Cavity: In this study, 17 cases were presented with oral carcinomas i.e., 42.5%. Out of 17 cases, females are 9 i.e., 53% and males are 8 i.e., 47%.

Primary lesion of oral carcinomas located in majority of the cases was from anterior 2/3rd of tongue (35.2%) and palate (35.2%). Remaining cases, primary site location is at buccal mucosa (23.5%) and floor of mouth (5%). Few other similar studies reported that, Oral SCC affects the tongue in 20%-40% of cases and the floor of the mouth in 15% - 20% of the cases, and together these sites account for about 50% of all cases of oral SCC.^{41, 42} the gingivae, palate, retromolar area and the buccal and labial mucosa are oral sites less frequently affected.⁴³

In our study in patients of carcinoma of the oral cavity, metastasis is mostly to level me, II and

III. The same was described by Shah J.P.⁴⁴ and Candela F.C.⁴⁵ that nodal involvement usually occurs at level -I, II, III in carcinoma of oral cavity.

Posterior parts of oral cavity either drain directly into the upper deep cervical nodes (level II/III) or indirectly via the submandibular nodes in level IB. More anterior parts of the oral cavity and tongue also drain to the submental nodes (level Ia) or indirectly to the jugulo-omohyoid nodes

(level III/IV) low in the neck. This is in accordance to our study where the lesions from the primary growth drain into the specific lymphnodes.

Oropharynx: Oropharyngeal squamous carcinomas is said to represent 10-15 percent of all head and neck tumors. There is an increasing prevalence of oral cavity and Oropharyngeal cancers in the last decade, particularly in men aged 35-64 years.⁴⁶ The frequency distribution of the primary site carcinoma in the oropharynx is tonsil or faucial pillar 45%, posterior tongue 40%, soft palate 15% and posterior Oropharyngeal wall 5%.⁴⁷ The condition is more common in men, with a sex ratio of 4:1. Each level of neck may be palpate systemically. It must be remembered that the majority of lymphnodes metastasis will be located in levels II, III and IV.^{48, 49}

In this study, 4 cases were presented with orepharyngeal carcinomas i.e., 10% and all were 4. In 3 (75%) cases the Primary lesion of cervical lymph node metastasis was from base of tongue and in 1 (25%) case it is from left tonsillar area.

In this study 2 cases are Moderately Differentiated Squamous Cell Carcinomas and 1 case is Well Differentiated Squamous Cell Carcinoma and 1 is Poorly Differentiated Squamous Cell Carcinoma.

In a study conducted by Vartanian et al,⁵⁰ 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 is base of tongue. In Oropharyngeal malignancy, metastasis is mainly to level II and III. This is in accordance to organ specific drainage of the oropharynx where the lesion from the oropharynx drain into the upper and middle deep cervical lymphnodes again either directly or via the retropharyngeal or submandibular nodes.

Hypopharyngeal Carcinomas: The hypopharynx is an uncommon site of tumors, the majority being malignant and accounts for less than 10% of all squamous cell carcinomas overall. The distribution macroscopically of Hypopharyngeal cancer varies geographically, with tumors of the

pyriform sinus being the most common subsite in North America and Europe, and post cricoids lesions more common in Northern Europe and UK. The mean age at presentation is 60 years. Pyriform sinus and posterior pharyngeal wall carcinomas demonstrate a male dominance. Post cricoids lesions unlike other sites show a female preponderance.⁵¹ the majority of the tumors present as ulcers and are widely infiltrative. They have tendency to extend submucosal and also to metastasize to the local lymph nodes. Cervical lymphadenopathy is frequent at the time of presentation and is most often detected at level IIa and III. In this study, 6 cases were presented with Hypopharyngeal carcinomas i.e., 15%. Out of 6 cases, males are 4 i.e., 66.7% and females are 2 I.e., 33.3%. In majority of the cases the primary lesion was found to be post cricoids region 4 cases (66.7%). Out of remaining two cases, one each from pyriform fosse (16.6%) and posterior pharyngeal wall (16.6%).

Laryngeal Carcinoma: Laryngeal cancer represents one of the most common head and neck malignancies, accounting approximately for 20% of all cases. The vast majority of tumors are squamous cell carcinomas.^{44, 44} Up to 40% of patients present with advanced disease. Due to the important physiologic functions of the larynx, advanced laryngeal lesions are associated with significant morbidity and mortality for the patient and increased financial costs for society^{34, 45}

In this study, 7 cases were presented with Carcinoma Larynx i.e., 17.5%. Out of 7 cases, males are 6 i.e., 85.7% and one female patient i.e., 14.3%. The primary lesion for cervical node metastasis was found to be supra-glottis area. 5 patients complained of change in voice, 4 of them presented with neck swellings and 3 of them presented with dysphasia. Six out of seven cases attended, presented at a stage IVA and one case presented at a stage III. Supraglottis drain through vessels which accompany the superior laryngeal pedicle via the thyroid membrane to reach the upper deep cervical nodes (levels II/III). In our study, supraglottic lesions metastasis is mainly to level I, II and III. In study conducted by Akmansu et al,³⁸ neck metastasis according to tumor localization were follows 26.5% glottis and

66.7% in Tran's glottis. But in our study all cases of primary localization is in supraglottis.

Nasopharyngeal Carcinoma: Nasopharyngeal Carcinoma is caused by the interaction of genetic susceptibility, environmental factors (e.g., exposure to chemical carcinogens), and infection with Epstein-Barr virus. High antibody titers to Epstein-Barr virus antigens are useful diagnostic markers, and there are many tests to detect both IgG and IgA titers.

In this study, 1 case is presented with nasopharyngeal carcinomas i.e., 2.5%. It presented with chief complaint of neck swelling similar to as reported by Tiong et al⁶⁵ from Malaysia. The nasopharynx drain via the junctional nodes into upper deep cervical nodes (levels II, III) having passed through retropharyngeal lymphnodes or submandibular lymphnodes. The above study correlates with our study in accordance to lymph node metastasis pattern.

Tumors in oral cavity and pharynx having higher incidence of metastatic disease at presentation than those in larynx and this are important when treating these sites. The high incidence of occult metastasis in tumors of the oral cavity, pharynx and to lesser extent the supra-glottic larynx forms the basis for selective neck dissection and assuming that the pattern of spread from tumor site is applicable to sub-clinical microscopic metastasis, the following rules apply. The first echelon lymph nodes for the oral cavity lie in the levels I, II, and III. The first echelon lymph node levels for larynx and pharynx lie in the levels II, III, and IV.

CONCLUSION

By this study it is evident that there is clear pattern of relationship between organ-specific drainage and incidence of cervical metastasis.

In our study the primary lesions and the level of lymphnodes involved were:

Oral cavity (42.5%) levels of lymph node involved are – IB, II, and III. Oropharynx (10%) levels of lymphnodes node involved are – IB, II, and III. But in case of Hodgkin's lymphoma (2.5%) level of lymphnodes involved is IB and in Non-Hodgkin's lymphoma (2.5%) level of

lymphnodes involved is Band II along with generalized lymphadenopathy. It is clearly established fact that it is possible to predict the site of primary lesion based upon the distribution of cervical lymphadenopathy.

Mostly in patients presented with cervical lump the primary lesion could be easily identified following the organ specific drainage knowledge. Moreover the levels of lymphnodes and other characters are helpful in predicting the type of disease in case of inflammatory nodes. In this study level-V nodal involvement and the matting helped in strong suspicious of Tuberculosis, confirmed by HPE.

This study helps in planning and dealing occult metastasis tumors and other lesions of oral cavity, pharynx by following echelon lymphnodes for the corresponding primary sites. More number of sample size required for a confirmed conclusion. Hence thorough clinical examination of the neck in cases of head and neck diseases is helpful in the diagnosis as well as management.

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