Online ISSN: 2581-3935
Print ISSN: 2589-7837

International Journal of Medical Science and Diagnosis Research (IJMSDR)

Available Online at www.ijmsdr.com

Volume 2, Issue 4; July-August: 2018; Page No. 07-14

ULTRASONOGRAPHY EVALUATION OF CERVICAL LYMPHADENOPATHY WITH CLINICOPATHOLOGICAL CORRELATION.

Dr.Dharmendra Parmar[1], Dr. G.L. Meena[2]

[1]Post Graduate Student, [2]Senior Professor and Head,

Department of Radio-Diagnosis, Sardar Patel Medical College & Associate Groups of PBM Hospitals, Bikaner (Rajasthan).

ABSTRACT:

Background- Cervical lymphadenopathy is one of the most common causes of mass in head and neck region; there are various causes of CL common among them are reactive, tuberculosis, metastasis, and lymphoma.

Methods- In this study, 100 patients age between 12 years and 80 years with cervical lymphadenopathy referred for ultrasonography of neck to the Department of Radiodiagnosis, S.P. Medical College, over a period of 1 Year are included in this study.

Result- out of 59 Metastatic nodes 45 (76%) were present in males and 14 (24%) in females. Lymphoma was found to be in 9 patients of which 6 (67%) were males and 3 (33%) females. Tubercular nodes were presents in 11 cases, of which 6 were males (54%) and 5 were females (46%).Reactive lymphadenopathy was noted in 21 cases out of which 13 were males (61%) and 8 were females (39%).

Conclusion- This study concludes that ultrasonographic examination proved as a valuable primary investigation to identify lymph nodes and differentiate non-neoplastic and neoplastic lymphadenopathy.

Keywords- Cervical lymphadenopathy, Ultrasonography, Malaginant.

INTRODUCTION:

Cervical lymphadenopathy is one of the most common causes of mass in head and neck region; there are various causes of CL common among them are reactive, tuberculosis, metastasis, and lymphoma.

Ultrasonographic criteria for distinguishing neoplastic and non-neoplastic lymph nodes have been studied under site, shape, size, echogenicity, hilum, matting, nodal border, long/short axis ratio, intranodal necrosis, and angioarchitecture.[1]

Ultrasonographic features that help to identify abnormal nodes as well as giving clues to neoplastic nodes are heterogeneous echogenicity, absent hilus, invasion, and intranodal necrosis. The shape is the best method to attempt the differentiation between neoplastic and non-neoplastic lymph nodes. The long/short diameter ratio of lymph node provides excellent criteria for differentiation between neoplastic and non-neoplastic cervical lymphadenopathy.[2]

Material and methods

Corresponding author: Dr. G.L. Meena

In this study, 100 patients age between 12 years and 80 years with cervical lymphadenopathy referred for ultrasonography of neck to the Department of Radiodiagnosis, S.P. Medical College, over a period of 1 Year are included in this study. All scans carried out on 5-10 MHz linear transducer using SIEMENS ultrasound-guided (USG), Philips machine.

Inclusion Criteria

1. All patients coming for ultrasound neck.

2. Patients more than 12 years of age of either sex.

Exclusion Criteria

1. Moribund patients.

2. No fi ne needle aspiration cytology (FNAC) available.

3. Patient with no evidence of cervical lymphadenopathy on ultrasound. Common ultrasound scan planes used in the examination of cervical nodes in different regions of the neck.

Results

Table 1: Classification according to age and sex

Age	Metastatic		Lymphoma		TB		Reactive		Total
	M	F	M	F	M	F	M	F	
0-10	0	0	0	0	5	1	2	0	8
11-20	1	2	1	0	1	0	2	2	9
21-30	0	1	0	0	0	2	1	2	6
31-40	5	0	0	1	0	0	1	2	9
41-50	12	6	2	1	0	2	2	1	26
51-60	10	3	2	1	0	0	3	1	20
61-70	12	2	0	0	0	0	2	0	16
71-80	5	0	1	0	0	0	0	0	6
Total	45	14	6	3	6	5	13	8	100

The above table shows out of 59 Metastatic nodes 45 (76%) were present in males and 14 (24%) in females. The age group of 41-50 showed 12 male patients and 5 female patients.

Lymphoma was found to be in 9 patients of which 6 (67%) were males and 3 (33%) females. The distribution of lymphoma cases was equal in age group 41-50 and 51-60 years (2 males and 1 female in each group).

Tubercular nodes were presents in 11 cases, of which 6 were males (54%) and 5 were females (46%) with maximum number being in the age group 0-10 years (5 males and 1 female).

Reactive lymphadenopathy was noted in 21 cases out of which 13 were males (61%) and 8 were females (39%). The age group 11-20 years had equal number of sex distribution (2 males and 2 females) and 51-60 years had 3 males and 2 females.

Table 2.Gray scale observation of nodes

A. American Joint Cancer Committee classification

LEVEL	METASTASIS	LYMPHOMA	TB	REACTIVE	TOTAL
IA	0	0	0	0	0
IB	1	0	0	1	2
II	3	0	1	1	5
III	2	0	0	0	2
IV	1	0	0	0	1
V	1	0	1	0	2
VI	0	1	0	2	3
SC	12	0	0	1	13
MULTI LEVEL	39	8	9	16	72
TOTAL	59	9	11	21	100

The above table shows that multilevel involvement was more common in all groups the lymphoma (88%), tuberculoses (81%), reactive (76%) and metastases (66%).

B. Metastatic nodes- Level according to primary site

LEVEL	Head and Neck	Thyroid	Esophagus	Bronchus	Breast	Prostate	Stomach	Cervix	Unknown
Multilevel	26	2	2	3	-	4	-	-	2
Single level									
IA	-	-	-	-	-	-	-	-	-
IB	1	-	-	-	-	-	-	-	-
II	2	-	1	-	-	-	-	-	-

III	2	-	-	-	-	-	-	-	-
IV	1	-	-	-	-	-	-	-	-
V	-	-	-	-	-	-	-	-	1
VI	-	-	-	-	-	-	-	-	-
SC	-	1	2	6	3	1	1	2	-
TOTAL	32	3	5	9	3	2	1	2	3

Among the metastatic nodes multilevel involvement was more common in head and neck carcinoma (80%) followed by those cases where primary site was unknown (66%)
Whereas carcinomas from other site showed metastases to supraclavicular lymphnodes (57%).

C. Size

I. Mean long and short axis length of lymph nodes

Mean Length In mm	Metastatic	Lymphoma	TB	Reactive
Long axis	26	30	27	19
Shot axis	22	27	23	14

II. Long and Short axis (L/S) ratio of lymph nodes

L/S Ratio	Metastatic	Lymphoma	TB	Reactive	Total
<2	57 (97%)	9(100%)	9(82%)	3(14%)	93
2 or >2	2(3%)	0(-)	2(18%)	18(86%)	7
Total	59	9	11	21	100

L/S ratio of <2 was noted – in lymphoma 100% nodes 97%, tubercular 82% and reactive 14%.

While L/S ratio of 2/>2 was noted in 86% reactive nodes, 18% of tubercular nodes and 3% of metastatic nodes.

D. Shape

Shape	Metastatic	Lymphoma	TB	Reactive	Total
Round	43(72%)	6(67%)	7(64%)	7 (33%)	63
Elliptical	16 (28%)	3(33%)	4(36%)	14(66%)	37
Total	59	9	11	21	100

My study showed that round shape of the node was common in metastases- 72%, lymphoma- 67% and tuberculous nodes 64%.

Whereas elliptical shape of node was more common in reactive nodes (66%).

E. Margin

Margin	Metastatic	Lymphoma	TB	Reactive
Ill defined	9 (15%)	0 (-)	5 (45%)	2(10%)
Well defined	50(85%)	9(100%)	6(55%)	19(90%)

In my study all lymphoma cases (100%) showed well defined margins followed by reactive nodes (90%), metastatic nodes (85%) and tubercular nodes (55%).

Ill defined margin was a feature of tubercular nodes (45%) followed by metastases (15%) and in 10% of reactive nodes.

F. Echogenicity

Echogenicity	Metastatic	Lymphoma	TB	Reactive	Total
Hypoechoic	43 (73%)	1 (11%)	8 (78%)	8 (38%)	57
Hyperechoic	11(19%)	1 (11%)	1 (10%)	0 (-)	13
Anechoic	0 (-)	0 (-)	0 (-)	1 (5%)	1
Isoechoic	5 (8%)	7 (78%)	2 (18%)	12 (57%)	29
Total	59	9	11	21	100

The above table shows that metastatic nodes were usually hypoechoic (73%), to adjacent muscle, while lymphoma nodes tended to be more isoechoic (78%), 1 case of reactive node was found to be anechoic.

G. Echogenic hilum

Echogenic hilum	Metastatic	Lymphoma	TB	Reactive	Total
Normal	0 (-)	0 (-)	1 (9%)	11 (53%)	12
Lost	52 (88%)	9 (100%)	8 (73%)	3 (14%)	72
Thinned out	4 (7%)	0 (-)	1 (9%)	4 (19%)	9
Irregular	3 (5%)	0 (-)	1 (9%)	2 (14%)	7
Total	59	9	11	21	100

Out of 9 case of lymphoma all nodes have sowed loss of echogenic hilum in 100%, while in metastatic nodes incidence was 88%, in tubercular nodes it was 73% and in reactive nodes it was only 14%. Normal echogenic hilum was noted in 53% if reactive nodes and 9% of tubercular nodes.

H. Necrosis

	Metastatic	Lymphoma	TB	Reactive
Present	18 (31%)	0 (-)	7 (64%)	2 (10%)
Absent	41 (69%)	9 (100%)	4 (36%)	19 (90%)
Total	59	9	11	21

In my study, necrosis was most commonly seen in tubercular nodes (64%) followed by metastases (31%) and reactive nodes (10%), Necrosis was not seen in any lymphoma node.

I. Calcification

Calcification	Metastatic	Lymphoma	TB	Reactive
Present	8 (14%)	1 (11%)	1(9%)	0 (-)
Absent	51 (86%)	8 (89%)	10(91%)	21 (100%)
Total	59	9	11	21

Among of 59 metastatic nodes, 8 had shown calcification (14%), out of 9 cases of lymphoma 1 had calcification (11%) and out 11 cases of tubercular 1 (9%) had calcification.

J. Invasion of adjacent structures

Invasion	Metastatic	Lymphoma	TB	Reactive	Total
Muscle	6 (11%)	0 (-)	0	0	6
Vessel	2 (3%)	1 (11%)	0	0	3

Out of 59 cases of metastatic nodes 8 showed invasion into either muscle (11%) or vessel (3%). While out of 9 cases of lymphoma 1 showed invasion into vessel. Invasion into the adjacent structures was not seen in tubercular or reactive nodes.

Discussion

My study of "Ultrasonographic and Doppler evaluation of cervical lymph nodes with clinicopathological correlation" makes and attempts to show the importance of gray scale and Doppler evaluation in evaluation of cervical lymph nodes.

It has made and attempt to study the different characteristics of lymph nodes with the use of gray scale and Doppler criteria to divide the lymph nodes into four main categories namely, Metastatic, Lymphoma, Tubercular and Reactive.

My study showed that the incidence of benign lymphnodes was highest in 0-10 years of age and malignant lymphnodes was highest in 41-50 years of age. Vikramjit S Kanwar[3] concluded that benign adenopathy is most common in young children whose immune systems are responding more frequently to newly encountered infections.

Gray scale ultrasonography added with color Doppler was able to differentiate all cases of benign and malignant nodes. There by showing the sensitivity of ultrasound to be 100% in my study. Study by Ahuja et al[4] showed that gray scale sonographic features had a high sensitivity (95%) and specificity (83%) in classifying metastatic and nonmetastatic nodes. And power Doppler sonography aided in the diagnosis in 5% and 17% in metastatic and nonmetastatic nodes, respectively.

Classification:

Metastatic nodes:

Incidence of metastatic nodes was highest in 41-60 years of age, with male preponderance. The ratio of male: female being 3.2:1.

The commonest complaints of patients with metastatic nodes were anorexia, weight loss and swelling of the neck.

Gray scale observations:

Level of the lymph nodes:- My study showed that, metastatic nodes from head and neck malignancy more commonly affected multiple levels of cervical nodes.(66%).

While that from the non-head and neck malignancy, affected the supraclavicular lymphnodes (57%).

Study of Ying M et at. [5]showed that abnormal nodes in nodal metastases from NHN (Non Head and Neck) carcinomas were commonly found in the supraclavicular fossa (38%) and the posterior triangle (41%).

Whereas Brekel et al. [6] commented that nodes situated in mid jugular, low jugular, and supraclavicular areas should be considered highly suggestive of metastases.

Size of the node:- In my study, the mean long axis diameter of 56 metastatic node was found to be 26 mm and mean short axis diameter 22 mm.

Tschammler et al. [7]demonstrated the mean longest diameter of 56 metastatic nodes to be 19.2mm +/- 8.8. and Pedro et al. 6observed minimum axial diameters of 7mm for level II (Upper internal jugular chain) and 6mm for the rest of the neck in 93% of metastatic lymph nodes.

Long axis/Short axis ratio: (L/S ration)- In my study, L/S ratio was <2 in 57 cases with metastasis (97%), Solbiati et al.65 first described the use of a long to short axis ratio (L/S) in the distinction between benign (L/S>2.0) and malignant nodes (L/S<2.0). Kusacic Kuna et al.[8]found that longitudinal/transverse ratio of <2 indicated the presence of metastases.

Shape of the lymph nodes:- In my study, of the 59 cases with metastatic nodes 72% were round in shape, which is consistent with the study of Ahuja et al. [9] which showed that metastatic nodes were round in 63-94%. And the study of Takashima et al. [10] showed that a rounded outline, had an 80% diagnostic value for metastatic nodes.

Margin: - In my study, 85% of metastatic nodes showed well defined margins whereas ill defined margins were noted in the 15%. Ying and Ahuja[11]had concluded that metastatic nodes tend to have sharp borders.

Echogenicity of the nodes:- In my study, metastatic nodes were hypoechoic to adjacent muscle in 73% of cases, hyperechoic in 19% of cases and isoechoic in 8% of cases. Ahuja et al.[11] noted that metastatic nodes are usually hypoechoic.

Conclusions

This study concludes that ultrasonographic examination proved as a valuable primary investigation to identify lymph nodes and differentiate non-neoplastic and neoplastic lymphadenopathy.

Bibliography

1. Sakai et al RCNA vol 38 page 0:979 sept 2000.
2. Head and Neck Imaging, Peter Som and Hugh Curtin, 4th edition, cha-36, 1866
3. H van Overhagon, JS Lameris, MY Berger, F van der Voorde, HW Tilanus, AL Kiooswijk, HM Zonderland and R van Pel Supraclavicular lymph node metastases in carcinoma of the esophagus and gastroesophageal junction; assessment with CT, US, and US-guided fine-needle aspiration biopsy Radiology, Vol 179, 155-158
4. Patrick J. Fultz, Army R. Harrow, Simone P. Sonographically Guided Biopsy of Supraclavicular Lymph nodes: A Simple Alternative to Lung Biopsy and other more Invasive Procedures AJR 2003;180; 1403-1409
5. Stella S. Y. Ho Anil T. Ahuja, Sing F. Leung ,Jacqui Kew and Con Metreweli Metastatic Adenopathy from Nasopharyngeal Carcinoma: Successful Response to Radiation to Radiation Therapy Assessed by Color Duplex Sonography American journal of Neuroadilogy20:151-156
6. Choi MY, Lee, JW, Jang KJ Distinction between benign and malignant causes spectral waveform analysis. AJR An H Roentgenol. 1995 Oct; 165(4);981.
7. Ivo A. Olivotto, Boon Chua, Sharon J, Allan, Caroline H.Speers, Stephen Chia, Joseph Ragaz long-Term Survival of Patients with supraclavicular Metastases at Diagnosis of Breast Cancer Journal of Clinical Oncology, Vol 21, Issue 5 (March), 2003;851-854
8. Saeter G, Fossa SD, Ous S, Blom GP, Kaalhus O, Carcinoma of the prostate with soft tissue or non-regional lymphatic metastases at the time of diagnosis; a review of 47 cases, Br J Urol. 1984;56;385-90
9. Butler JJ, Howe C, Johnson D. Enlargment of the supraclavicular lymph nodes as the initial sign of prostatic carcinoma, Cancer. 1971;27;1055 -1063
10. Leou Chuan Pang, MD Solitary Recurrent Metastasis of squamous cell Carcinoma of the Uterine Cervix in the Spleen: Case Report Southern Medical Journal 97(3):301-304, March 2004.
11. Colletier PJ, Garden AS, Morrison WH, Goefert H, Geara F, Ang KK, Postoperative radiation from an unknown primary site: outcomes and patterns of failure. Head Neck 1998;20:674-681.