Original Article

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Ultrasonography in Assessment of Cervical Lymph Nodes

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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. The present study assessed cervical lymph nodes using Ultrasonography (USG). **Subjects and Methods:** The present study was conducted on 78 patients who underwent USG of neck of both genders. The cervical lymph nodes classified based on the location in the neck into VII levels according to AJCC classification. **Results:** Age group 11-20 comprised of 8 cases, 21-30 had 15, 31-40 had 20, 41-50 had 27 and 51-60 had 8 cases. USG showed 40 cases malignant, 27 reactive and 11 tubercular.The difference was significant (P< 0.05). Histopathology showed 34 cases malignant, 32 reactive and 10 tubercular. The difference was significant (P< 0.05).FNAC had sensitivity of 98.2% and specificity of 94.4%, USG had sensitivity of 91.2% and specificity of 86.2%. The difference was significant (P< 0.05). **Conclusion:** Authors found that ultrasonographic examination proved as a valuable primary investigation to identify lymph nodes.

Keywords: Cervical lymph nodes, FNAC, Ultrasonograph.

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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. The differentiation helps in both planning treatment and prognosis. Imaging modalities for the evaluation of cervical lymphadenopathy are ultrasound, CT, MRI and USG guided FNAC. Recent advances include PET, PET CT and ultrasound elastography.1Biopsy and other pathological tests are invasive and time consuming.[1]

In sonography examinations, cervical lymph nodes are usually classified into eight regions. Normal and reactive lymph nodes are usually found in submandibular, parotid, upper cervical, and posterior triangle regions.[2] On gray-scale sonography, normal and reactive nodes tend to be hypoechoic compared with adjacent muscles and oval (short axis–to–long axis ratio [S/L] < 0.5) except for submandibular and parotid nodes, which are usually round (S/L ≥ 0.5), and to have an echogenic hilus. The upper limit in minimal axial diameter of normal and reactive nodes is 9 mm for subdigastric and submandibular nodes and 8 mm for other cervical node.[3]

Sonography is a useful imaging tool in the assessment of cervical lymph nodes. Gray-scale sonography is widely used in the evaluation of the number, size, site, shape, borders, matting, adjacent soft-tissue edema, and internal architectures of cervical lymph nodes. Although both color and power Doppler sonography are routine, 3D sonography is not commonly used to assess the intranodal vascular distribution. With the use of spectral Doppler sonography, the vascular resistance of lymph nodes can also be measured.[4]

Colour Doppler Sonography can further characterize lymphnodes as non-neoplastic (Reactively, tubercular) and neoplastic. The non-neoplastic (Reactive) nodes show increased central hilar vascularity, with radial symmetry whereas, neoplastic (Malignant) nodes show absent hilar vascularity and increased peripheral.[5]The present study assessed cervical lymph nodes using Ultrasonography (USG).

Subjects and Methods

The present study was conducted in the department of Radiodiagnosis. It comprised of 78 patients who underwent USG of neckof both genders. The study was approved from institutional ethical committee. All patients were informed regarding the study and written consent was obtained.

Data such as name, age etc. was recorded. The ultra sonographic technique was done methodical from superior to inferior aspect of the neck. The cervical lymph nodes classified based on the location in the neck into VII levels according to AJCC classification, merely to simplify the sonographic examination of the neck. That is:

submandibular region → parotid → upper cervical, middle cervical lower cervical → supraclavicular fossa → Superior mediastinal nodes and the posterior triangle, next head is turned to left side and whole sequence is done on right. FNAC was also done. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

Results

Table 1: Age wise distribution of cases

Age group (Years)	Number	P value
11-20	8	0.04
21-30	15	
31-40	20	
41-50	27	
51-60	8	

Table 1 shows that age group 11-20 comprised of 8 cases, 21-30 had 15, 31-40 had 20, 41-50 had 27 and 51-60 had 8 cases

Table 2: Diagnosis with USG

Diagnosis	Number	P value
Malignant	40	0.05
Reactive	27	
Tubercular	11	

Table 2 shows that USG showed 40 cases malignant, 27 reactive and 11 tubercular.The difference was significant (P< 0.05).

Table 3: Diagnosis with Histopathology

Diagnosis	Number	P value
Malignant	34	0.05
Reactive	32	
Tubercular	10	

Table II shows that histopathology showed 34 cases malignant, 32 reactive and 10 tubercular. The difference was significant (P< 0.05).

Table 4: Sensitivity and specificity of USG & FNAC

Parameters	FNAC (%)	USG (%)	P value
Sensitivity	98.2	91.2	0.01
Specificity	94.4	86.2	0.02

Table 4, graph I shows that FNAC had sensitivity of 98.2% and specificity of 94.4%, USG had sensitivity of 91.2% and specificity of 86.2%. The difference was significant (P< 0.05).

Discussion

In sonography examinations, cervicallymph nodes are usually classified intoeight regions. Normal and reactivelymph nodes are usually found in submandibular, parotid, upper cervical, and posteriortri angle regions. On gray-scalesonography, normal and reactive nodestend to be hypoechoic compared with adjacentmuscles and oval (short axis–to–longaxis ratio [S/L] < 0.5) except for submandibularand parotid nodes, which are usuallyround (S/L ≥ 0.5), and to have an echogenic hilus. The upper limitin minimal axial diameter of normal and reactivenodes is 9 mm for subdigastric andsubmandibular nodes and 8 mm for othercervical nodes.[6]

On color Doppler, power Doppler, and3D sonography, normal cervical nodesshow hilar vascularity or appear avascular,and reactive nodes predominantly show hilar vascularity. On spectralDoppler sonography, normal and reactive nodes usually show low vascular resistance(resistive index [RI] and pulsatility index. Inflammation causes vasodilatation,which increases blood flowvelocity in reactive lymph nodes. It may explainthe low vascular resistance in reactivelymph nodes given that high blood flow velocityis always associated with a lowervascular resistance.[7]The present study assessed cervical lymph nodes using Ultrasonography (USG) and histopathologically.

We found that age group 11-20 comprised of 8 cases, 21-30 had 15, 31-40 had 20, 41-50 had 27 and 51-60 had 8 cases. USG showed 40 cases malignant, 27 reactive and 11 tubercular.

Singh et al[8]found that out of 45 non neoplastic nodes (reactive and tubercular) only 41 nodes were identified as non-neoplastic (reactive/ tubercular) on ultrasound prior to FNAC/ histopathology. Out of 55 possible neoplastic (malignant nodes) detected on ultrasound only 46 lymph nodes turned out to be neoplastic on FNAC/ histopathology. Lymph node with oval shape (L/S ratio > 2) echogenic hilum, homogenous echotexture and hilar vascularity were considered as significant parameters in detecting non-neoplastic (reactive) lymph nodes, which showed matting with soft tissue edema were considered nonneoplastic lymphnodes (Tubercular lymphnodes). Nodes which were Round shape (L/S ratio < 2), absent hilum, heterogeneous echotexture, hilar, capsular vessels and mixed vascularity were considered as significant parameters in detecting neoplastic (malignant) lymph nodes. Correlation of sonographic findings with Fine Needle Aspiration Cytology/ Histopathological findings was performed. Sensitivity and Specificity of ultrasound in differentiating neoplastic from non-neoplastic cervical lymphadenopathy was found to be 90% and 74% respectively.

We found that histopathology showed 34 cases malignant, 32 reactive and 10 tubercular. The difference was significant (P< 0.05).FNAC had sensitivity of 98.2% and specificity of 94.4%, USG had sensitivity of 91.2% and specificity of 86.2%.

Jank et al[9] foundthat ultrasonography sensitivity and specificity for detecting malignant nodes was 96% and 69% respectively. Ahuja et al[10] concluded that ultrasound was 95% sensitive and 83 % specific for classifying metastatic/ non metastatic lymph nodes.

Conclusion

Authors found that ultrasonographic examination proved as a valuable primary investigation to identify lymph nodes.

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