

Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.elsevier.com/locate/mjafi

Original Article

Ultrasound evaluation of cervical lymphadenopathy: Can it reduce the need of histopathology/cytopathology?

Maj Somali Pattanayak^{a,*}, Col Samar Chatterjee^b, Brig R. Ravikumar^c,
Brig V.S. Nijhawan^d, Brig Vivek Sharma^e, Col Jyotindu Debnath^f

^a Clinical Tutor, Dept of Radiodiagnosis & Imaging, Armed Forces Medical College, Pune 411040, India

^b Senior Adviser (Radiodiagnosis), Command Hospital (Southern Command), Pune 411040, India

^c Commandant, Military Hospital Bhopal, India

^d Commandant, Military Hospital Patiala, India

^e Consultant (Radiodiagnosis & Imaging), Army Hospital (R&R), Delhi, India

^f Professor, Dept of Radiodiagnosis & Imaging, Armed Forces Medical College, Pune 411040, India

ARTICLE INFO

Article history:

Received 20 June 2016

Accepted 26 April 2017

Available online xxx

Keywords:

Cervical lymphadenopathy

B Mode

Colour Doppler ultrasound (CDUS)

ABSTRACT

Background: The differentiation between the causes of cervical lymphadenopathy is of paramount importance as these have different modalities of treatment with varying prognosis. The aim of this study was to evaluate the efficacy of B Mode and colour Doppler ultrasound (CDUS) to differentiate between benign and metastatic lymph nodes.

Methods: 100 patients of clinically palpable lymph nodes were evaluated with B Mode and CDUS. B Mode assessment included short-long (S:L) axis ratio, hilum, nodal border, echogenicity, intranodal necrosis and ancillary features. CDUS assessment included distribution of vascularity, resistive index (RI) and pulsatility index (PI). Statistical analysis was carried out with histopathological or cytological diagnosis as gold standard.

Results: B-Mode US correctly diagnosed 22/25 (88%) of the reactive lymph nodes giving it a sensitivity of 88% and specificity of 97.3%. Colour Doppler US diagnosed 23/25 (92%) reactive lymph nodes with a sensitivity of 92% and specificity of 97.3%. B-Mode underdiagnosed one case each of granulomatous disease and metastasis as reactive node while CDUS missed out two cases of granulomatous disease as reactive lymph node.

Conclusion: Individual parameters of B Mode when used alone were not found to be very effective in differentiating benign and malignant lymph nodes. However features of B-Mode combined together as well as color Doppler ultrasound, help in the detection of reactive lymph nodes and can be used as a diagnostic tool with good accuracy. However, they cannot be used as a diagnostic method for metastatic or tubercular nodes and cytopathology/histopathology remains the gold standard in such situations.

© 2017 Published by Elsevier B.V. on behalf of Director General, Armed Forces Medical Services.

* Corresponding author.

E-mail address: somali0109@gmail.com (S. Pattanayak).

<http://dx.doi.org/10.1016/j.mjafi.2017.04.005>

0377-1237/© 2017 Published by Elsevier B.V. on behalf of Director General, Armed Forces Medical Services.

Introduction

Pathological cervical lymph nodes are encountered in neoplastic as well as non-neoplastic conditions. Clinical examination remains important in the evaluation of cervical lymphadenopathy in day to day practice. However, clinical examination is frequently inaccurate in distinguishing benign from malignant causes which is crucial in prognostication and further treatment planning.^{1,2} Imaging plays an important role in the evaluation of cervical lymphadenopathy especially in distinguishing benign from malignant etiology. Almost all diagnostic imaging modalities (Ultrasound, CT, MRI) have been found to have superior diagnostic accuracy as compared to physical examination. Ultrasound (USG) has long been utilized to assess cervical lymph nodes. The addition of color Doppler has further sharpened the diagnostic accuracy.³ Advantages of USG include wider accessibility, availability of high frequency probes with greater resolution, no radiation issues and real time examination in multiple planes with feasibility for USG guided aspiration cytology/histopathology whenever needed.³

Ahuja et al. reported an accuracy of 96.8% for B mode USG in differentiating benign from malignant cervical lymphadenopathy.⁴ With the addition of Color Doppler, Yousem et al. reported an improved accuracy over B mode USG in evaluating cervical lymphadenopathy.⁵ Although there are a large number of studies describing and correlating USG and Doppler features of benign as well as malignant cervical lymphadenopathy with cytological/histopathological examinations, there is paucity of literature on the use of USG in predicting benign versus malignant etiology and thereby reducing the need for cytology/histological examination. The present study aimed at diagnosing and predicting etiology (benign vs malignant) in fresh cases of clinically palpable undiagnosed cervical lymphadenopathy based on established standard criteria on B mode as well as Color Doppler studies. The study also attempted to find out if USG features can be used to reduce the need of cytology/histopathology examination in select cases.

Material and methods

This cross sectional descriptive study was carried out from September 2012 to August 2014 at Department of Radiodiagnosis and Imaging of a tertiary care and teaching hospital. The study was approved by institutional ethics committee.

Study population: Patients with visible or clinically palpable neck nodes referred for ultrasonography from indoor or outdoor services of the hospital formed the study group.

Sample size: One hundred patients (100) of clinically palpable neck nodes were included for the final study. The sample size was calculated by comparing the sensitivity of ultrasound (reactive lymph node ~ 88%) with FNAC (reactive lymph node ~ 99%) at 90% power and at 5% level of significance. The minimum sample size thus calculated was 103. Sample size for this study was taken as 100.

Inclusion criteria: All consecutive, non-repetitive patients with clinically palpable neck swelling referred for ultrasonography were taken as the study group.

Exclusion criteria: All previously treated or diagnosed patients, patients who were lost to follow-up or who did not undergo cytology/histopathology were excluded from the study.

Informed consent was taken from all the patients as per WHO format.

Equipment used: Ultrasound examination was performed using linear transducer (7–10 MHz, Logiq P5, GE Health care, USA).

Parameters studied in B-Mode ultrasound: Distribution of lymph nodes, size, shape, short to long axis (S/L) ratio, hilum (absence or presence), nodal echogenicity (hypo/hetero/hyperechoic), nodal border (sharp/unsharp), nodal calcification and necrosis and ancillary features (matting/soft tissue edema/both).^{6,7}

Parameters studied in Color Doppler Ultrasound (CDUS): Vascularity (peripheral/central/mixed), resistive index (RI), pulsatility index (PI).⁸

Criteria of nodes on USG/Color Doppler:

Reactive LN: A lymph node was considered reactive if the node is oval in shape, hypoechoic with presence of central echogenic hilum, had unsharp borders, had no nodal calcification or ancillary features like necrosis or matting. On CDUS, a lymph node was considered reactive if central vascularity was maintained. No definite cut off was considered in RI and PI values.

Metastatic LN: A lymph node was considered metastatic if the node was round, hyper or hypoechoic with loss of central echogenic hilum, had sharp borders, and had central necrosis or intranodal calcification. On CDUS, a lymph node was considered malignant if central vascularity was lost with presence of peripheral vascularity. No definite cut off was considered in RI and PI values.

Tuberculosis was considered if nodes had absent hilum, unsharp nodal border, hypoechoic echotexture, intranodal necrosis, had matting with peripheral vascularity. Lymphoma: Lymphomatous nodes were diagnosed if nodes were round in shape with absent hilum, sharp nodal borders, hypoechoic echotexture with intranodal reticulation, absence of ancillary features and mixed vascularity.^{6,7,8}

Statistical analysis: B-Mode and CDUS findings were compared with the cytological/histopathological findings. Sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV) and inter-observer variability (kappa) were calculated. Receiver operating characteristic (ROC) curves were drawn for cut-off values of RI and PI of reactive, tubercular, lymphomatous and metastatic lymph nodes. Statistical analysis was done using SPSS (Statistical Package for Social Sciences) Version 19.0. *p*-Value was calculated for each of the criteria separately using Chi Square test or Fisher's exact test as appropriate. *p*-Value < 0.05 was considered statistically significant.

Results (Figs. 1–3, Tables 1–5)

One hundred and twelve untreated and previously undiagnosed patients with visible or clinically palpable cervical lymphadenopathy were examined with B-mode, color and spectral Doppler analysis over a period of two years from September 2012 to August 2014. Out of the 112 patients

Download English Version:

<https://daneshyari.com/en/article/8706887>

Download Persian Version:

<https://daneshyari.com/article/8706887>

[Daneshyari.com](https://daneshyari.com)