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ROLE OF HIGH RESOLUTION ULTRASOUND WITH COLOR DOPPLER FINDINGS IN TUBERCULAR CERVICAL LYMPHADENOPATHY

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ABSTRACT

INTRODUCTION: To evaluate the Ultrasound, Color Doppler findings in enlarged cervical lymph nodes in tuberculosis patient.

MATERIALS AND METHODS: We evaluated 48 cases of tubercular cervical lymphadenopathy, referred for USG evaluation of the neck. All of USG findings were correlated with cytopathological / histopathological findings.

RESULTS: In our study, 58.3% (28/48) of tubercular nodes were unilateral. Short axis >10 mm was seen in 91.7% of tubercular lymph nodes. In our study 66.7% tubercular nodes were round on USG. Blurring of margins was seen in 41.7% of tubercular lymph nodes. Hilum was absent in 75% on USG. In our study 40 % of tubercular lymph node were hypoechoic. In 91.7% tubercular nodes had necrosis on USG. Matting was found in 50% cases of tubercular nodes. Tubercular nodes showed predominantly hilar vascularity on Color Doppler. Tubercular cervical lymph nodes showed RI<0.77 and PI<1.6.

CONCLUSION: Gray scale USG coupled with Doppler is a useful investigation in the evaluation of tubercular cervical adenopathy and is complementary to the CECT as it is non-invasive, inexpensive, readily available and free of radiation.

KEYWORDS :

INTRODUCTION

Cervical lymph nodes are involved commonly in tuberculosis and many other benign conditions.[1,2] Ultrasound is a useful imaging tool in evaluation of cervical lymph nodes. However, USG is non-invasive, inexpensive, readily available and free of radiation. It can also be used as an imaging tool for the guided aspirations.[3]

AIM AND OBJECTIVE

To evaluate the Ultrasound, Color Doppler findings in enlarged cervical lymph nodes in tuberculosis patient.

MATERIALS AND METHODS

All the cases suspected of having tubercular cervical lymphad enop athy in the neck referred for ultrasound and Color Doppler were included in the study. Cases for which cytopathological/ histopat hol ogical correlation could not be obtained, were excluded from the study. On USG lymph nodes were assessed for Distribution, Anatomical site {According to imaging based nodal classification (adopted from Som P.M. Curtin H.D. Mancuso A.A.)[4] (Table 1)] Size , Shape, Outline, Hilum, Echogenicity, Calcification, Intranodal necrosis, Matting, Color Doppler study -a) Vascular pattern [Hilar ,Avascular ,Peripheral ,Mixed] b)Doppler indices [Resistive Index (RI) Pulsatility Index (PI)] .

USG was performed on Siemens Sonoline Antares Machine with high frequency linear transducers VFX 10–5 MHz and VFX 13-5 MHz (Figure 2). In all cases, representative superficial lymph node was evaluated with respect to size, shape, echo texture and color Doppler findings.

STATISTICAL ANALYSIS-

Data was analyzed using software SPSS version 15 statistical analysis software.

RESULT

Total 100 cases of cervical lymphadenopathy referred for USG were evaluated in the study. According to final cytopathological/ histopathological diagnosis 48 cases were tubercular lymph nodes. Neck swelling was the commonest complaint in all cases of cervical lymphadenopathy.

MORPHOLOGY OF TUBERCULAR CERVICAL LYMPHA DENOPATHY ON GRAY SCALE USG:

In our study, majority of tubercular nodes were unilateral 58.3% (28/48). Short axis >10 mm was seen in 91.7% (44/48) of tubercular lymph nodes. In our study 66.7% (32/48) of tubercular lymph node were round in shape. Blurring of margins, suspicious of extranodal extension was seen in 41.7% (20/48) of tubercular lymph nodes. Hilum was absent in 75% (36/48) of TB lymph nodes. In our study 40(83.3%) of tubercular lymph node were hypoechoic. In our study 91.7% (44/48) of tubercular lymph nodes had necrosis (Image 1,2,3). Matting was found in 50% (24/48) cases of tubercular lymph nodes. Most of the tubercular lymph nodes were found at level II and IV. Distribution of lymph nodes was not statistically significant in our study.

DOPPLER EXAMINATION FINDINGS IN CERVICAL LYM PHADENOPATHY

Tubercular lymph nodes showed all pattern of vascularity with predominance of hilar pattern. In our study 50% (24/48) of tubercular nodes showed hilar vascularity, 25% (12/48) showed peripheral vascularity and 16.7% (8/48) showed mixed vascularity.

VASCULAR INDICES -

most of the tubercular lymph nodes showed RI<0.77 and PI<1.6. For RI, the cut-off value 0.77 was observed whereas for PI, the cut-off value 1.61 was observed.

DISCUSSION

Neck swelling was the commonest complaint in all cases of cervical lymphadenopathy.

USG FINDINGS

In our study 91.7% of tubercular lymph nodes were above 10 mm in short axis diameter and 66.7% (32/48) of tubercular lymph node were round.

L/S ratio was ≥2 in 33.3% of tubercular lymph nodes However, Na et al found L/T ratio greater than 2 in 74% of benign lymph nodes.[5,6]

Blurring of margins, suspicious of extranodal extension was seen in 41.7% (20/48) of tubercular lymph nodes. Similar findings were reported by Ahuja et al (2002) reported findings of extra-capsular invasion in 51% cases of tubercular lymph nodes.[7] However Gupta et al 2007 found sharp border in 70.4% cases of tubercular lymph nodes.[8]

Hilum was absent in 75% (36/48) of TB lymph nodes. These findings were similar to findings of Ahuja A et al (2002) who showed absence of hilum in 57-91% of similar cases.[7] It has been reported that 84%-92% of benign nodes.[9]

Heterogeneous echotexture was seen in 16.7%(8/48) cases of tubercular lymph nodes in our study while no hyperechoic node was found. In our study 83.3% (40/48) of tubercular lymph nodes were hypoechoic while Gupta et al found that 100% of tubercular nodes were hypoechoic.[8]

Calcification was not seen in any of the cases of tubercular lymph nodes in our study while Gupta et al (2007) found calcification in 37%

cases of tubercular lymph nodes.[8]

In our study 91.7% (44/48) of tubercular lymph nodes had necrosis. This was comparable to the study by Gupta et al which found necrosis in 100% cases of tubercular lymph nodes.[8]

Tubercular lymph nodes had matting in 50% (24/48) cases in our study, it was similar with Ying et al (1998) who reported matting in 59% of tubercular lymph nodes.[10]

Most of the tubercular lymph nodes involved level II and IV lymph nodes in our study, while Ishikawa et al [11] found the submandibular area is a common site for tubercular nodes.

DOPPLER EXAMINATION FINDINGS

Tubercular lymph nodes showed all pattern of vascularity however predominant pattern was hilar vascularity. In our study 50% (24/48) of tubercular nodes showed hilar vascularity and 25% (12/48) tubercular nodes showed peripheral vascularity, whereas in the study by Ahuja et al 12% of tubercular nodes showed capsular vascularity.[12] According to Ahuja et al[12] 50% of tubercular nodes showed hilar vascularity while in our study, 50% of tubercular nodes showed hilar vascularity.

Tubercular lymph nodes show low resistance hemodynamics. Mostly cases of tubercular lymph nodes showed resistive index (RI) <0.77 and pulsatility index (PI) <1.6. In this study, mean value of RI was 0.69±0.10 in benign lymph nodes. PI had mean value of 1.45±0.39 in benign group.

In cases when color Doppler USG indicates the presence of tubercular nodes, FNAC / biopsy is required to confirm the findings in an attempt to reach final diagnosis.

CONCLUSION

USG and Color Doppler is particularly relevant in developing countries which have limited availability of CT & MRI scanners. USG & Color Doppler findings in addition to being radiation free are very useful and may avoid biopsy /FNAC.

Table 1: An Imaging based nodal classification (adapted from Som P.M., Curtin H.D, Mancuso A.A.).[4]

Level	Definition of nodes
I	Above hyoid bone Below mylohyoid muscle Anterior to back of submandibular gland
IA	Between medial margins of anterior bellies of digastric muscles Previously classified as submental nodes
IB	Posterolateral to level IA nodes Previously classified as submandibular nodes
II	From Skull base to level of lower body of hyoid bone Posterior to back of submandibular gland Anterior to back of sternocleidomastoid muscle
IIA	Anterior, lateral, medial, or posterior to internal jugular vein Inseparable from internal jugular vein (if posterior to vein) Previously classified as upper internal jugular nodes
IIB	Posterior to internal jugular vein with fat plane separating nodes and vein Previously classified as upper spinal accessory nodes
III	From level of lower body of hyoid bone to level of lower cricoid cartilage arch Anterior to back of sternocleidomastoid muscle Previously known as mid jugular nodes
IV	From level of lower cricoid cartilage arch to level of clavicle Anterior to line connecting back of sternocleidomastoid muscle and posterolateral margin of anterior scalene muscle Lateral to carotid arteries Previously known as low jugular nodes
V	Posterior to back of sternocleidomastoid muscle from skull base to level of lower cricoid arch. From level of lower cricoid arch to level of clavicle as seen on each axial scan. Posterior to line connecting back of sternocleidomastoid muscle and posterolateral margin of anterior scalene muscle. Anterior to anterior edge of trapezius muscle
VA	From skull base to level of bottom of cricoid cartilage arch Posterior to back of sternocleidomastoid muscle Previously known as upper level V nodes
VB	From level of lower cricoid arch to level of clavicle as seen on each axial scan Posterior to line connecting back of sternocleidomastoid muscle and posterolateral margin of anterior scalene muscle Previously known as lower level V nodes
VI	Between carotid arteries from level of lower body of hyoid bone to level superior to top of manubrium Previously known as visceral nodes
VII	Between carotid arteries below level of top of manubrium Caudal to level of innominate vein
Supraclavicular	At or caudal to level of clavicle as seen on each axial scan Above and medial to ribs
Retropharyngeal	Within 2 cm of skull base and medial to internal carotid arteries

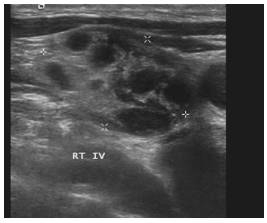

Image 1: 30 Yrs old male patient with FNAC proven tuberculosis. USG image showing heterogeneous, hypoechoic, necrotic, matted lymph nodes.

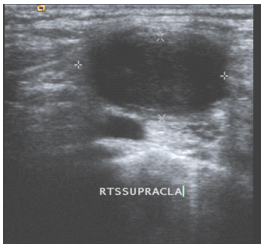

Image 2: 32 Yrs old female patient with FNAC proven tuber culosis, USG image showing well defined hypoechoic necrotic lymph node.

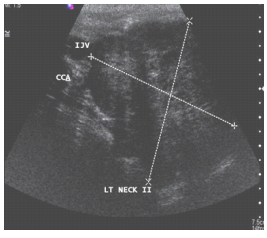

Image 3: 63 Yrs old male patient with FNAC proven benign non-TB (benign reactive hyperplasia), USG image showing well defined necrotic, matted nodes.

LEGENDS

IMAGE 1:

30 Yrs old male patient with FNAC proven tuberculosis.
USG image showing heterogeneous, hypoechoic, necrotic, matted lymph nodes.

IMAGE 2:
32 Yrs old female patient with FNAC proven tuberculosis,
USG image showing well defined hypoechoic necrotic lymph node.

IMAGE 3:
63 Yrs old male patient with FNAC proven benign non-TB (benign reactive hyperplasia), USG image showing well defined necrotic, matted nodes.

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