ORIGINAL ARTICLE

Efficacy of Colour Doppler Ultrasound in Diagnosis of Malignant Cervical Lymphadenopathy

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ABSTRACT

Objective: To evaluate efficacy of colour Doppler ultrasound for the diagnosis of malignant cervical lymph nodes.
Methodology: During period of 12 months, 50 patients who presented in Ear Nose and Throat Out-patient Department with neck swelling and in the workup for evaluation of neck swelling colour doppler ultrasound of neck was included apart from fine needle aspiration cytology (FNAC) and computed tomography (CT) scan. The colour Doppler of the neck swelling was initially done and its results were compared with fine needle aspiration cytology.
Results: Out of 50 patients, 17 patients were found to be malignant on the basis of Doppler findings.
Conclusion: The colour Doppler ultrasonography is non-invasive, quick and relatively cheep tool to differentiate between benign and malignant lymphadenopathy.
Keywords: Cervical lymphadenopathy, Colour Doppler ultrasound, histopathology.

INTRODUCTION

Colour Doppler ultrasound is a non-invasive procedure that can determine the normal morphologic and vascular characteristics of lymphadenopathies. Both vascular architecture and flow dynamics difference among various cervical nodal diseases. In metastatic lymph nodes angioarchitecture is destroyed due to neoplastic infiltration while in inflammatory nodes there is dilatation of intranodal vessels. These vascular alteration features help us to differentiate between benign and malignant lymph nodes.1-6 In our routine daily practice, the causes of lymphadenopathy include infections malignancy, autoimmune disorder, miscellaneous and unusual conditions and iatrogenic causes.3 This study was an attempt to compare efficacy of fine needle aspiration cytology and colour Doppler study to differentiate benign from malignant.

MATERIAL AND METHODS

The study was conducted in the Department of Radiology joined with Department of Ear Nose Throat and Head and Neck Surgery Shaikh Zayed Hospital, Lahore Pakistan in 12 months. We selected 50 patients who presented with neck node swelling in ENT department and among these patients 29 were male and 21 were female. Age range was 7 to 66 years with mean of 36 years of age. We included all the patients having neck node swelling on clinical examination whether primary known or unknown. We excluded the patient who were previously had metastatic work-up done. We also excluded the patient in which there was recurrence of disease whether primary or secondary. All patients having acute neck swelling with known primary source of infection in ENT region were also excluded. In all these patients detailed medical history and a thorough general and ENT examination was done.

Colour doppler ultrasound study for cervical lymph nodes was carried out by Senior Radiologist using a linear transducer of 7.5 MHz. No clinical data or provisional clinical diagnosis was provided to radiologist. Criteria considered in CDUS of lymph nodes include colour flow signals or perfusion and intranodal vascular resistance (RI and PI). The final result obtaied after receiving final report of fine needle aspiration cytology and its comparison with colour Doppler ultrasonography.

Colour Flow Signals on Doppler: The presence of colour flow signals in centre of node suggest if benign nature. This is due presence of converging sinuses in the centre of node. The presence of peripheral flow suggest a malignant nature. On the bases of location of vascularity on colour doppler ultrasounds enlarged lymph nodes were divided into four groups.

1. Control: Colour flow signals branching radially from the centre.
2. Peripheral: Colour flow signals present along the periphery of the lymph nodes, its branches perforating the periphery of node and not arising from hilum.
3. Mixed: Presence of both central and peripheral colour flow signals.
4. No flow: Absent vascular signals.

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RESULTS

The results of imaging findings were compared with FNAC report showing that on Doppler study out of 50, 17 patients seen to be have malignant lymph nodes which were confirmed on FNAC showing 13 patients had malignancy while 4 patients had inconclusive FNAC.

Table 1: Age distribution of patients (n=50)

Age in years	=n	%age
<10	7	14.0
11-30	12	24.0
31-60	26	52.0
>60	5	10.0

Table 2: Sex distribution of patients

Gender	=n	%age
Male	29	58.0
Female	21	42.0

Male to female ratio: 1.38:1

Table 3: Frequency of malignant and benign patients according to Sex

	Male	Female	Total
Malignant	11 (22%)	6 (12%)	17 (34%)
Benign	20 (40%)	13 (26%)	33 (66%)

Table 4: Frequency of Doppler Ultrasound and FNAC

	Doppler	FNAC	Total
Malignant	17 (34%)	9 (18%)	26 (52%)
Benign	21 (42%)	3 (6%)	24 (48%)

Table 5: Type of Cervical Lymph nodes

	Doppler (USG)	FNAC
Malignant	29 (58%)	33 (66%)
Benign	21 (42%)	17 (34%)

DISCUSSION

The role of colour doppler ultrasound in the evaluation of metastatic lymph nodes depend upon the fact that tumours having size more than 10mm in diameter stimulate the growth of new vessels. This tumour neovascularity has few characteristics that enable a presumptive diagnosis of malignancy to be made. In evaluating nodal vascularity doppler ultrasound demonstrates two main characteristics[5-7].

Pattern of vascular distribution within lymph node.

Vascular parameters for detection of intravascular resistance including RI and PI.

In this study on colour doppler ultrasound (CDUS) we have detected that neck nodes were benign in 33 patients. In these patients on CDUS there was prominent central hilor vascularity due to increase in vessel diameter and blood flow. If we compare the present findings with previous reports, it shows that presence of central flow is an indication of reactive or inflammatory node.[8-10] According to Ahuja et al[7-11,13] both tuberculous and reactive nodes frequently demonstrates.

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