ROLE OF MULTIDETECTOR COMPUTED TOMOGRAPHY IN EVALUATION OF CERVICAL LYMPHADENOPATHY

By
Enas A. Abd-El Gawad*, Osama A. W. Khalil*,
Balegh Hamdi A. Alhak** and Shery Magdy Sadek*
Departments of *Radiodiagnosis and **ENT, El-Minia Faculty of Medicine

ABSTRACT:
Objective: The aim of this study was to clarify the role of Multidetector Computed Tomography (MDCT) in evaluation of cervical lymphadenopathy.
Patients and Methods: This study included 30 cases of cervical lymphadenopathy. Multidetector CT examination of the neck was performed for all the thirty patients included in this study using a 16-row multidetector scanner prior to any biopsy procedures. The MDCT examinations of the neck were interpreted for the CT criteria of the enlarged cervical lymph nodes as regarding to their size, shape, central necrosis, calcification, enhancement pattern, and extranodal extension. Nodal staging as well as determination of the nodal levels according to imaging-based classification system was also performed.
Results: In this study, the most reliable MDCT criteria that show statistical significance for diagnosing enlarged cervical lymph nodes were the shape (p=0.001), central necrosis (P=0.001), enhancement (p=0.001), and extranodal tumor extension (p=0.04). Comparison between the MDCT results and the pathological results for detection of the cause of enlarged cervical lymph nodes revealed that the total sensitivity of MDCT in diagnosing the cause of cervical lymph nodal enlargements was 92.3% with a specificity of 75% and accuracy of 90%.
Conclusion: MDCT is a sensitive and accurate non invasive imaging modality for assessment of the enlarged cervical lymph nodes**.**

KEYWORDS:
Cervical Lymphadenopathy MDCT

INTRODUCTION:

Enlarged cervical lymph nodes are the most common cause of neck mass in an adult. In patients older than 40 years, the enlarged nodes are most often secondary to metastatic carcinoma, usually from a primary neoplasm of the aerodigestive tract. In patients between 21 and 40, the enlarged cervical lymph nodes are most often secondary to lymphoma. The optimal evaluation requires close attention to radiographic details as well as an understanding of basic anatomical and pathologic principles of otolaryngology[1]**.**

Many imaging modalities are used to evaluate the cervical lymph nodes such as ultrasound, CT, and MRI. Multi-detector CT (MDCT) is the latest breakthrough in CT technology. It is rapidly becoming the imaging modality of choice of the neck as it plays an important role in detecting and diagnosing the cause of enlarged cervical lymph nodes and stages the neck in cancer patients.[2]

The main advantages of MDCT are the enhanced speed of scan acquisition and the high spatial resolution because of the thin

collimation. This facilitates precise timing of multiphasic imaging and multiplanar reformations (MPR) using several reformation techniques. The intra venous contrast material that is used in MDCT examination of the neck facilitates differentiation of the neck vessels from the adjacent enlarged lymph nodes and characterizes lymph node pathology.[3]

PATIENTS AND METHODS:

Patients:

This study included 30 patients cervical lymphadenopathy. The patients were 19 males and 11 females (age range 5 – 81 years; average 42.1±21.5 years) presented to El Minia University Hospital from June 2011 to May 2012. Multidetector CT examination of the neck was performed for all the thirty patients included in this study prior to any biopsy procedures.

Procedures:

- Technique of MDCT examination:

Multidetector CT examination of the neck was performed using a 16-detector MDCT scanner (Bright Speed 16; GE Medical Systems). The scanning range will be individually adapted and included the skull base to the upper mediastinum. Contrast material is injected with a power injector (Medrad, Stellant) through an 18- or 20- gauge catheter in to the antecubital vein. The injection flow rate is 4ml/sec. A total of 70 ml of non ionic contrast material is used. A timing bolus tracking technique is employed. The acquisition parameters were120 kVp, 350 mAs, a helical pitch of 0.938: 1, 7.5 second scan time, 16x 0.625mm detector configuration, 7.5 second total exposure time, 1.25mm helical slice thickness, and 1.25mm reconstruction interval with a large FOV.

- Image reconstruction:

For image reconstruction, the axial source images with a 1.25mm slice were transferred to an Advantage Workstation (AW) Volume Share 2 (GE Healthcare). Multiplanar reformatted images (MPR) images were obtained in the coronal and sagittal planes with a section thickness of 3-5mm.

Image analysis:

The MDCT images were interpreted for the following items:

1- MDCT criteria of enlarged cervical lymph nodes as regarding; size, shape, enhancement pattern, central necrosis, extra nodal spread, and calcification.

2- Determination of the nodal levels according to imaging-based classification system, 1999.

3- The number and location of enlarged cervical lymph nodes are also determined for purpose of nodal staging.

Statistical analysis:

Data entry was done by SPSS version 11 and analyzed by the same software. Frequency distribution, descriptive statistics, and correlation analysis were done using Chi^2 and Fisher exact tests for qualitative data. The probability (*p* value) of less than 0.05 is used as a cut off point for all significant tests.

RESULTS:

This study included 30 patients with a clinical diagnosis of enlarged cervical lymph nodes. Their ages ranged between 5 – 81 years with mean age 42.1±21.5 years. They were 19 male and 11 female.

The MDCT examinations of the neck were interpreted for the CT criteria of the enlarged cervical lymph

nodes as regarding to their size, shape, central necrosis, calcification, enhancement pattern, and extranodal extension. In this study the size criteria was determined by measuring the minimum transverse (short-axis) diameter of the enlarged cervical lymph nodes. One of the most important CT criteria of cervical lymph node enlargement was the presence of central necrosis with peripheral enhancement, it was detected in 17 (56.7%) out of 30 patients. The Extranodal tumor extension was detected in only 7 (23.3%) out of 30 patients. Other Characteristic MDCT feature of cervical lymphadenopathy was the nodal calcification, which was demonstrated in 8 (26.7%) out of 30 patients (Table 1).

According to the previous MDCT criteria which had been proposed to suspect the diagnosis and to differentiate between benign from malignant nodes, benign nodes were suspected in 5 (16.7%) out of 30 patients, and malignant nodes were suspected in 25 (83.3%) out of 30 patients as presented in (Table 2). MDCT staging of metastatic cervical lymph nodes was presented in table 3, most of the metastatic nodes were in stage N2b, they were demonstrated in 5 (35.7%) out of 14 patients. (Table 3)

In this study, the MDCT images were also interpreted for determination of the level nodal classification according to imaging-based system in to 7 levels. More than one patient in this study had multiple levels of nodal enlargements. (Table 4)

All the thirty patients were subjected to biopsy procedures as follow; 20 (66.7%) patients were subjected to fine needle aspiration biopsy and excisional biopsy was performed for 10 (33.3%). Pathological examination of the biopsied specimen of the enlarged cervical lymph nodes was performed for all patients included in this study for confirmation of the cause of nodal enlargements. The pathological causes of cervical lymph nodal enlargements were classified into benign and malignant causes, benign causes included inflammatory (reactive) and infectious (TB) causes, they were detected in 8 (26.7%) out of 30 patients 4 for each cause. Malignant causes of cervical nodal enlargements were further classified into primary and metastatic nodes, primary malignant nodes were detected in 8 (26.7%) out of 30 patients, the most common primary malignant cause was the Non-Hodgkin lymphoma which was detected in 6 (20%) out of 30 patients. Metastatic nodes were demonstrated in 14 (46.6%) out of 30 patients. Nodal metastases from nasopharyngeal squamous cell carcinoma was the most common pathological type of metastatic nodes, as 4 (28.6%) from total 14 patients with metastatic nodes had squamous cell carcinoma nodes.

Each one of the MDCT criteria in this study was statistically tested for their reliability for diagnosing and for differentiating between benign from malignant nodes using the pathological diagnosis as a gold standard. In this study, the most reliable MDCT criteria that show statistical significance for diagnosing enlarged cervical lymph nodes were the shape (p=0.001), central necrosis (P=0.001), enhancement (p=0.001), and extranodal tumor extension (p=0.04). (Table 5)

Comparison between the MDCT results and the pathological results for detection of the cause of enlarged cervical lymph nodes as a well as the sensitivity, specificity and accuracy of MDCT were presented in table 6. The total sensitivity of MDCT

in diagnosing the cause of cervical lymph nodal enlargements was 92.3% with a specificity of 75% and accuracy of 90%. (Table 6)

Table (1): Characteristic mdct features of enlarged cervical lymph nodes **(N=30)**

MDCT criteria	Number	Percent
Size:		
— **All other nodes >10 mm**	20	66.7%
— **Jugulodigastric nodes >11mm**	7	23.3%
— **Retropharyngeal nodes >5mm**	3	10%
Shape:		
— **Oval**	2	6.7 %
— **Round**	18	60 %
— **Irregular**	10	33.3%
Central necrosis	17	56.7%
Enhancement		
— **Peripheral**	17	56.7%
— **Homogenous**	8	26.7%
— **Heterogeneous**	5	16.6%
Extranodal tumor extension	7	23.3%
Calcification	8	26.7%

Table (2): Causes of enlarged cervical lymph nodes as diagnosed by mdct **(N=30)**

Causes	Number	Percent
Benign nodes	5	16.7%
— **Inflammatory**	3	10%
— **Infectious (T.B)**	2	6.7%
Malignant nodes	25	83.3%
— **Primary**	11	36.7%
— **Metastatic**	14	46.6%
Total	30	100%

Table (3): Staging of metastatic cervical lymph nodes by mdct **(N=14)**

Stage	Number	Percent
N1	3	21.4%
N2a	0	0
N2b	5	35.7%
N2c	4	28.6%
N3	2	14.3%
Total	14	100%

Table (4): Imaging-based nodal classification by mdct **(N=30)**

Level	Number	Percent
Level I		
— **Level IA**	5	16.7%
— **Level IB**	10	33.3%
Level II		
— **Level IIA**	20	66.7%
— **Level IIB**	20	66.7%
Level III	21	70%
Level IV	19	63.3%
Level V		
— **Level VA**	12	40%
— **Level VB**	13	36.7%
Level VI	5	16.7%
Level VII	4	13.3%

Table (5): Reliability of mdct criteria as compared with the pathological diagnosis **(N=30)**

MDCT Criteria		Pathological verification				*P* value
		Benign nodes		Malignant nodes		
		Inflammatory	Infectious (T.B)	Primary	Secondary	
Size	All other nodes >10 mm	4(100%)	4(100%)	5(56.3%)	7(50%)	0.7
	Jugulodigastric nodes >11mm	0	0	2(25%)	5(35.7%)	
	Retropharyngeal nodes >5mm	0	0	1(12.5%)	2(14.3%)	
Shape	Inflammatory(4)	4(100%)	0	0	0	0.001*
	Infectious (4)	0	4(100%)	0	0	
	Malignant (22)	0	0	8(36.4%)	14(63.7%)	
Central necrosis	Normal (13)	4(30.8%)	1(7.7%)	7(53.8%)	1(7.7%)	0.001*
	Infectious (3)	0	3(100%)	0	0	
	Malignant (14)	0	0	1(7.1%)	13(92.9%)	
Calcification	Normal (22)	4(14.8%)	4(14.8%)	7(31.8%)	7(31.8%)	0.4
	Malignant (8)	0	0	1(12.5%)	7(87.5%)	
Enhancement	Normal (11)	4(36.4%)	0	7(63.6%)	0	0.001*
	Malignant (19)	0	4(21.1%)	1(5.3%)	14(73.7%)	
Extranodal tumor extension	NO (23)	4(17.4%)	3(13%)	7(30.4%)	9(39.1%)	0.04*
	Malignant (7)	0	0	2	5(71.4%)	

p value is considered significant if less than 0.05

Table (6): Sensitivity, specificity and an accuracy of mdct in detecting the cause of enlarged cervical lymph nodes **(N=30)**

Sensitivity%	Specificity%	Accuracy%	Error %
92.3%	75%	90%	10%

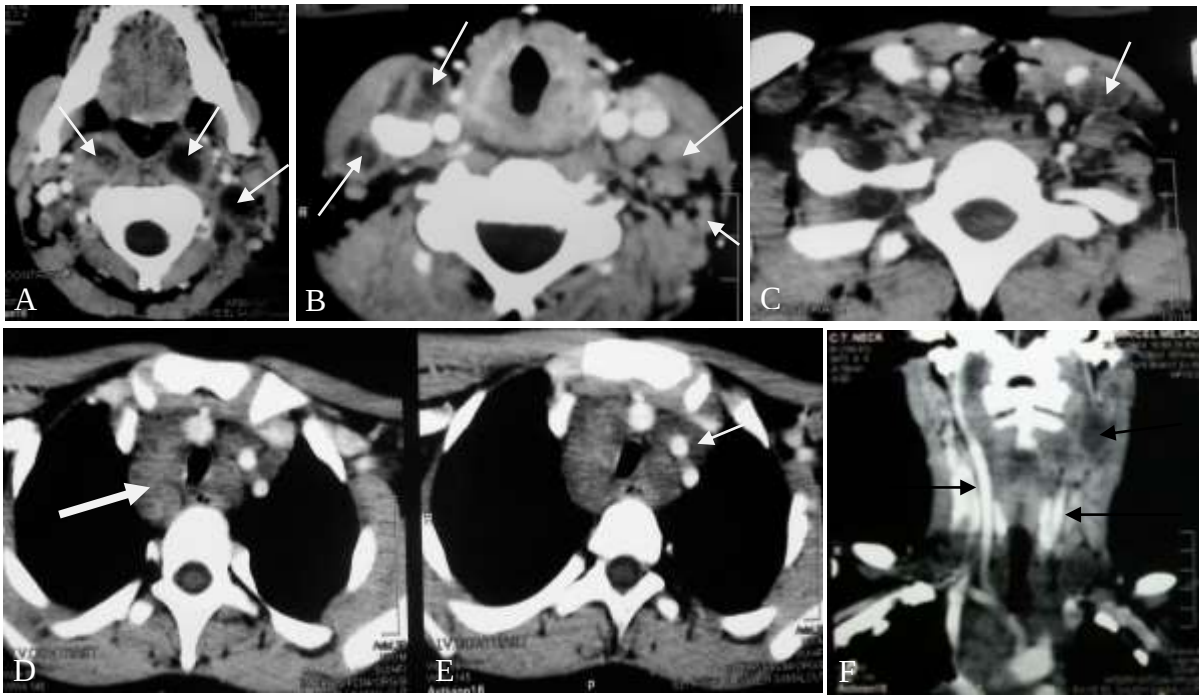

Fig. (1): 12-year-old male patient presented with multiple bilateral neck swellings. (A, B & C) Axial contrast enhanced MDCT images taken at the level of mandible, thyroid cartilage and first tracheal ring respectively show multiple bilateral enlarged cervical lymph nodes that nearly involving all nodal levels. The enlarged Lt. nodes are Level IIa, IIb, IV and V nodes, and Rt. Level IIa, IIb, III and V nodes. These nodes are well-defined, variable sized; most of them show central hypodensity representing central necrosis with peripheral enhancement. There is no infiltration of the adjacent fat planes, with no nodal calcification. (D & E) axial contrast enhanced images at lower levels show multiple enlarged paratracheal and perivascular lymph nodes (F) Coronal MPR clearly defines both carotid sheath, and the level and the shape of the nodes. These nodes are proved pathologically to be tuberculous adenitis.

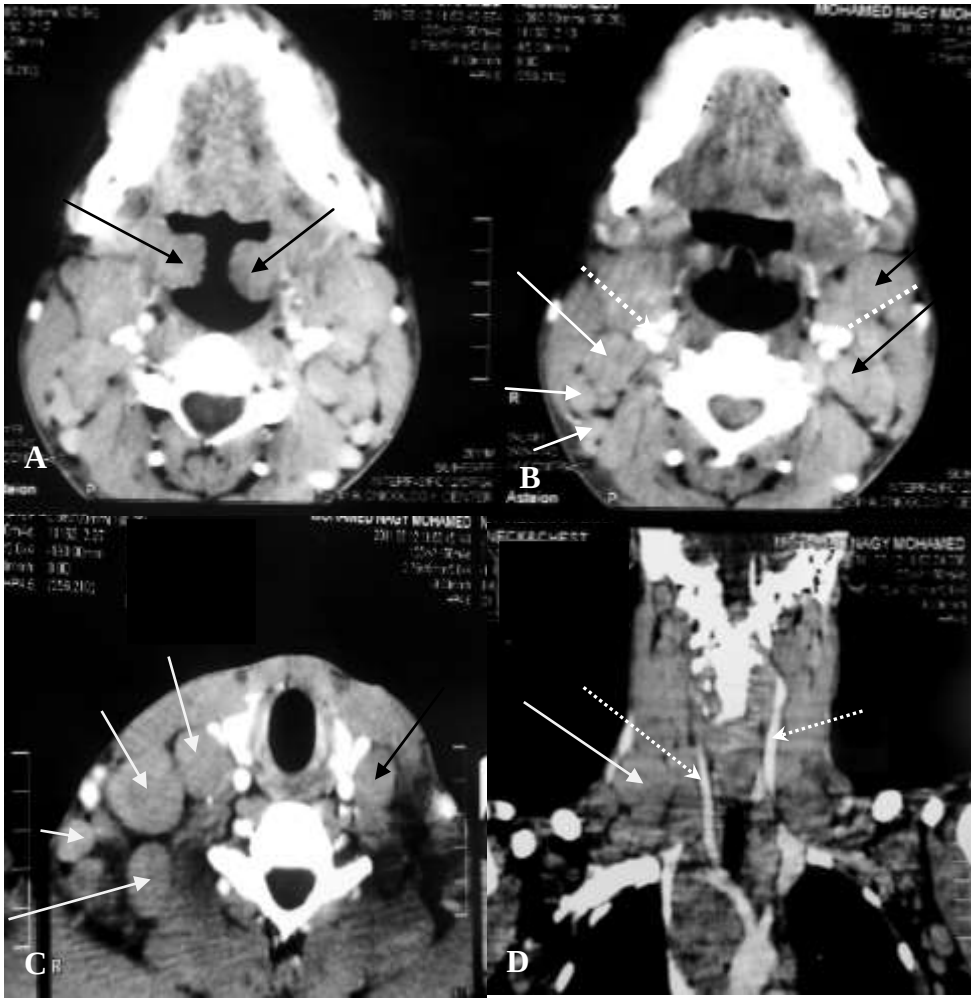

Fig. (2): 22-year-old male patient, presented with multiple bilateral neck masses. (A, B & C) Axial contrast enhanced MDCT images of the oropharynx and cricoid cartilage show bilateral hypertrophied tonsils *(black arrows in a)* with multiple bilateral enlarged cervical lymph nodes that nearly involving all nodal levels; Rt. Level IIa, IIb, IV and V nodes *(white arrows in b and c)*, and Lt. Level IIa, IIb, and IV nodes *(black arrows in b and c)*. These nodes are well-defined, variable in size, and shape (some are rounded, others are ovoid), isodense to the muscle, showing mild homogenous enhancement. No evidence of extranodal tumor spread, with preserved fat planes and intact carotid sheath on both sides. No central necrosis. No calcification. (D) Coronal MPR image shows the multiple bilateral enlarged nodes, and delineates the entire course of both carotid sheathes *(dashed white arrows in d)*, it also demonstrates the associated mediastinal lymph nodal enlargement *(thick white arrow in d)*. These nodes proved pathologically to be Non-Hodgkin lymphoma.

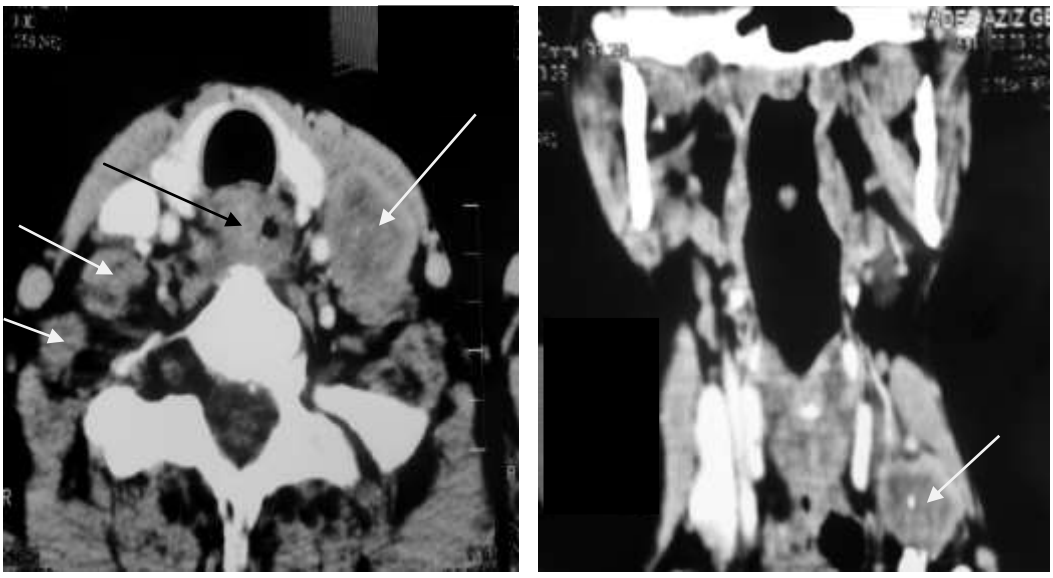

Fig. (3): 50-year-old male patient presented with neck swelling and dysphagia. (A) Axial contrast enhanced MDCT image shows a well-defined circumferential soft tissue thickening seen affecting the esophageal wall more evident at the Rt. Side encroaching upon, attenuating and displacing the esophageal lumen and indenting the posterior aspect of the trachea *(black arrow in a)*. This is associated with bilateral enlarged nodes, Rt. Level IV, V nodes and Lt. Level IV , V nodes *(white arrows in a, b)*. These nodes vary in size with the largest one is Lt. Level IV node. Most of the nodes are rounded and others are irregular in shape. The enlarged nodes show central low density representing central necrosis with peripheral enhancement. Calcification is seen in Left Level IV nodes. No extranodal tumor spread. Intact carotid sheathes (D) Coronal MPR image clearly show the shape of the nodes and delineate the entire course of both carotid sheaths. These nodes proved pathologically to be metastatic from squamous cell carcinoma of esophagus.

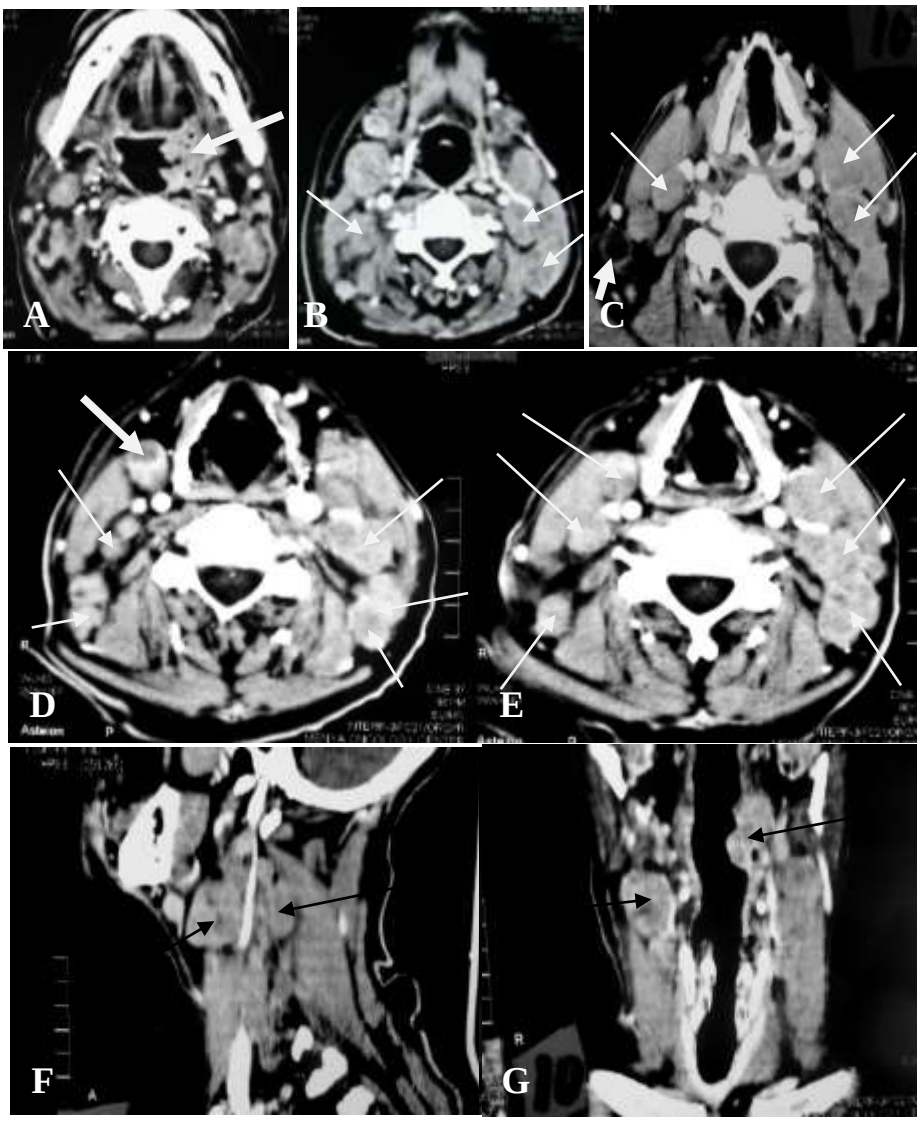

Fig. (4): 60-year-old male patient presented with tonsillar mass and bilateral neck swellings. (A-E) Multiple axial contrast enhanced MDCT images taken at different levels show irregular non homogenous Lt. tonsillar soft tissue mass, that is seen encroaching upon the oropharyngeal lumen *(thick white arrow in A)*. This is associated with multiple bilateral nodal enlargement seen involving multiple nodal levels; Rt. Level IIa, IIb, III, IV, V nodes, and Lt. Level IIa, IIb, III, IV, V nodes *(thin white arrows in B-E)*. The enlarged nodes are well- defined, rounded shaped, some of them show central low density representing central necrosis with peripheral enhancement seen at right level III and V*(thick white arrows in C & D)*, however all the other nodes show heterogeneous enhancement pattern with preserved fat planes. No extranodal tumor spread or calcifications. Sagittal (F) and coronal (G) MPR clearly defines the relations of nodes to carotid sheath *(black arrows in F)*, as well as the left tonsillar mass *(left black arrow in G)*. These nodes are proved pathologically to be metastatic from left tonsillar carcinoma.

DISCUSSION:

Cervical lymphadenopathy is usually defined as abnormal increase in size, and or altered consistency of lymph nodes, the cervical lymph nodes produce specialized immune system cells called lymphocytes that detect and combat pathogens in the body. Imaging of the neck is important to diagnose occult lesions and stage the neck in cancer patients with cervical lymphadenopathy[4].

In our study MDCT examination of the neck was performed for all the thirty patients prior to any biopsy procedures, The MDCT examinations of the neck were interpreted for the CT criteria of the enlarged cervical lymph nodes as regarding to their size, shape, central necrosis, calcification, enhancement pattern, and extranodal tumor extension. These CT criteria were based on several studies[5-10] which proposed a number of CT criteria to assess the presence of cervical nodal metastasis and to distinguish such nodes from reactive nodes.

The best radiological predictor of lymph node metastasis is the finding of central lymph node necrosis. In our study, Central necrosis with peripheral enhancement was detected in 17 (56.7%) out of 30 patients. Central necrosis with peripheral enhancement mostly occurs in metastatic lymph nodes and the contrast enhanced CT was the best modality for identification of necrosis, the results of our search were in agreement with King et al, 2004 who reported that nodal necrosis with a primary head and neck tumors is a most reliable sign of a metastatic node with an accuracy of MDCT by 93%.[11] And also in agree with Zoumalan et al, 2010 who reported that Lymph node central necrosis viewed by computed tomography scans is a useful indicator of metastatic lymph node and extracapsular spread, with a sensitivity of 95 per cent, a specificity of 85 per cent. [12]

Nodal enhancement seems to imply increased nodal vascularity, and suggests a wide differential diagnosis. In this study the most common pattern of nodal enhancement was the peripheral enhancement as it was detected in 17 (56.7%) out of 30 patients and this can be explained by that it is accompanied the central necrosis which was detected in 17 cases also. [13]

Som et al, 2003[13] reported that the most common causes of nodal enhancement are acute infections. The pattern of enhancement is usually homogenous but nodal enhancement when become associated with central necrosis; it usually indicates metastatic lymph nodes.

The extranodal tumor extension with arterial invasion of the internal carotid artery is a grave prognostic finding. In our study extranodal tumor extension was detected in 7 (50%) out of out of 14 patients, and this is can be attributed to that the size of metastatic lymph node was mostly less than 3cm 9 out of 14 (64.3%). This was in agreement with Som et al, 2003 [13] who postulated that as the lymph node enlarges; the incidence of extra capsular tumor spread rises. Our results were also in agreement with other studies of Collins et al, 1987 and Snow et al, 1982 [14, 15] which reported that 53% of lymph nodes 2 to 3cm in size have extranodal tumor spread.

Extranodal tumor extension was identified on contrast-enhanced CT by thickened nodal rim with infiltration of the adjacent fat plane. This was based on Som et al, 2003 who postulated that such extranodal

spread is less reliably identified on MRI than CT. This may simply due to that the low attenuation of fat on CT is the best background in which to identify such early nodal changes.[13]

Other MDCT criteria of cervical lymphadenopathy was the nodal calcification, which was demonstrated in 8 (26.7%) out of 30 patients, This value was higher than what reported by Eisenkraft et al, 1999 that nodal calcifications in the neck are uncommon, occurring in about 1% of cases This can be explained by increased prevalence of diseases that have in common calcified lymph node as tuberculosis and metastatic nodes from papillary thyroid carcinoma as well as other diseases as metastasis from cancer esophagus, metastasis from unknown primary, and with Non-Hodgkin lymphoma. [16]

For the purpose of nodal staging, the size, number and location of metastatic nodes in 14 cases were determined by MDCT. The staging system was based on 1997 AJCC nodal staging system for cervical lymph nodes. Accordingly the size of these metastatic lymph nodes were further classified into lymph nodes less than 3cm which was detected in 9 out of 14 cases, nodes between 3 and 6cm which was determined in 3 out of 14 cases and nodes more than 6cm which was detected in 2 out of 14 cases based on this. In size criteria together with number and location of lymph nodes were found that most of metastatic nodes in this study were in stage N2b representing 35.7% (Multiple, ipsilateral lymph nodes, none of which is greater than 6 cm).

Nodal staging differs from nodal classification. **Som et al, 2003** addressed the importance of nodal staging as he reported that whereas nodal classification identifies the nodal groups involved and is useful in assisting the clinician in determining the type of surgery that is best for that specific nodal disease, nodal staging relates the overall number, size, and location of the affected nodes to the prognosis.[13]

Based on imaging-based classification system the enlarged cervical lymph nodes were classified into 7 levels, It was detected that more than one patient in this study had multiple levels of nodal enlargement, The most affected levels of cervical nodal enlargement are level III nodes in 21 (70%) patients, level IIA nodes in 20 (66.7%) patients and level IIB nodes in 20 (66.7%) patients. Level II and III are the drainage nodes for these areas including the posterior temporoparietal region, upper pinna, preauricular Lateral pinna, Parotid root of the nose, eyelids, frontotemporal region, external acoustic meatus, tympanic cavity, posterior palate, Subparotid posterior nasal cavity, nasopharynx, oropharynx and hypopharynx. So they were the most affected levels from diseases of those regions especially by metastasis from squamous cell carcinoma of head and neck from the previously mentioned areas, and as detected in our search 14 cases from 30 were diagnosed by MDCT as metastatic lymph nodes; and most of them were metastatic from squamous cell carcinoma of nasopharynx, So these results were agreed with Lo SS et al, 2011 who reported that the role of CT is well established and CT remains the most common modality for tumor mapping and nodal staging particularly in the regions in which nasopharyngeal carcinoma (NPC) occurs with high frequency.[17]

Pathological examination of the biopsied specimen of the enlarged

cervical lymph nodes was performed for all patients included in this study for confirmation of the cause of nodal enlargement. The pathological causes of cervical lymph nodal enlargement were classified into benign and malignant causes, Benign causes including inflammatory (Reactive), and Infectious like tuberculosis, the benign nodes were detected in 8 (26.7%) out of 30 patients. Malignant causes of cervical nodal enlargement were further classified into primary and metastatic nodes, primary malignant nodes were detected in 8 (26.7%) out of 30 patients, the most common primary malignant cause was the Non-Hodgkin lymphoma which was detected in 6 (20%) out of 30 patients. Metastatic nodes were demonstrated in 14(46.6%) out of 30 patients. Nodal metastasis from nasopharyngeal squamous cell carcinoma was the most common pathological type of metastatic nodes, as it was detected in 4 (28.6%) from total 14 patients with metastatic nodes. This was in agreement with Holliday RA et al, 2003, who reported that enlarged cervical lymph nodes in patients older than 40 years are most often secondary to metastatic carcinoma usually from a primary neoplasm of the aerodigestive tract.[1]

In this study, the most reliable MDCT criteria that show statistical significance for diagnosing enlarged cervical lymph nodes was the shape (p=0.001), which was in agreement with Steinkamp et al, 1995 who reported that 95% of enlarged cervical nodes shown to have a long to short axis diameter (L/S ratio) of more than 2 were correctly diagnosed as benign. Nodes presenting with a more circular shape and an L/S ratio of less than 2 were diagnosed correctly as metastases with 95% accuracy**.** [18]

Central necrosis (P=0.001), enhancement (p=0.001), and extra-nodal tumor extension (p=0.04) were also statistically significant reliable MDCT criteria for assessment of the enlarged cervical lymph nodes, this was in agreement with Zoumalan et al, 2010, Van den Brekel et al, 1990 and Steinkamp et al, 1999 who reported that the best radiological predictor of lymph node metastasis is a finding of central lymph node necrosis, which has been reported to carry nearly 100 per cent accuracy in predicting the presence of metastatic disease[12,19,20] And in agreement with Steinkamp et al, 1994 who reported that use of CT for the identification of extracapsular spread has a sensitivity of 81% and a specificity of 72%.[21] Harnsberger, 2004 also reported that extranodal tumor spread is the most sensitive and specific feature of malignant nodes.[22]

In this study the size criteria was statistically insignificant in diagnosing the causes of enlarged cervical lymph nodes (P= 0.7), this was comparable with that of Som et al, 2003 who reported that the size criteria alone are inaccurate in 20% to 28% of cases either underestimating or overestimating the presence of tumor. Torabi et al, 2004 also reported that traditional size approach frequently overlooks metastasis, particularly when the metastasis involves only microscopic or partial infiltration of the lymph node. The specificity of size criterion also deteriorates because of benign inflammatory or infectious lymph node enlargement, leading to incorrect characterization of a benign lymph node as malignant**.**[23]

Another unreliable CT criteria in this study was the presence of calcifications of the enlarged lymph nodes (p=0.4), this was in accordance

with Eisenkraft et al, 1999 who reported that calcification is not a specific sign for malignancy as it occurs in a spectrum of benign and malignant cervical lymph nodes.[16]

In this study comparison between the MDCT results and the pathological results for detection of the cause of enlarged cervical lymph nodes was performed to determine the sensitivity, specificity and accuracy of MDCT in diagnosing the cause of cervical lymph nodal enlargement. In this study the total sensitivity of MDCT was 92.3% with a specificity of 75% and accuracy of 90%. These values were in agreement with many other studies, King et al, 2004 reported that the sensitivity of CT in differentiating benign from malignant neck nodes was 91%, with a specificity of 93% and the accuracy of 92%.[11] Xu et al, 1998 reported that the sensitivity of CT in detecting nodal diseases was 93.8%, with a specificity of 90%, and accuracy of 92.3%.[24] Carvalho P et al, 1991 also reported that the sensitivity of CT in the detection of nodal metastasis was 87.5% with specificity of 100% and accuracy of 90%.[25]

In this study, our results were more higher than the results of Ahn et al, 2008 who reported that the sensitivity of CT in evaluating the metastatic cervical lymph nodes was (77%), with specificity of (70%), and accuracy of (74%).[26] This can be attributed to the use of multidetector CT scan in our study which have many advantages over the conventional single slice CT because of thin collimation that allow faster scan acquisition that decrease the motion artifact and high spatial resolution with better image interpretation.

CONCLUSIONS:

MDCT is a valuable non invasive imaging modality for assessment of the enlarged cervical lymph nodes. It has a great role in characterization of cervical nodal enlargement which helps in differentiating benign from malignant cervical lymph nodes. It is a sensitive and accurate modality in diagnosing the cause of cervical lymph node enlargement with a total sensitivity of 92.3% and accuracy of 90%. It is also a valuable modality used for determining nodal levels and nodal staging in cancer patients which allowed appropriate diagnosis with subsequent proper surgical and treatment planning. So whenever possible, MDCT imaging should be performed prior to any nodal biopsy procedures.

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دور الاشعه المقطعيه متعدده المقاطع في تقييم امراض الغدد الليمفاوية العنقيه

الملخص العربى

يعد تضخم الغدد الليمفاوية العنقيه من أكثر أمراض الرقبة شيوعا ومن أشهر أسباب تضخمها هو اصابتها بالالتهاب الناتج عن العدوى فى حالات التهابات اللوزتين والبلعوم أو الإصابة بالدرن أو الإصابة بالأورام السرطانية الاوليه (الليمفوما) أو الثانويات الناتجه من الأورام السرطانية الخاصة بالجهاز التنفسي والهضمي . و لقد كان الهدف من هذه الدراسة هو توضيح دور الاشعه المقطعيه متعدده المقاطع في تقييم و تشخيص امراض الغدد الليمفاوية العنقيه. و لقد أجريت هذه الدراسة على ثلاثين مريضا ممن يعانون من تضخم فى الغدد الليمفاوية العنقيه ولقد تم عمل أشعة مقطعية متعددة المقاطع لجميع المرضى الذين اشتملت عليهم هذه الدراسة باستخدام جهاز الاشعه المقطعيه متعدد المقاطع ذو 16 صفا. و لقد روجعت جميع فحوص الاشعه المقطعيه بالصبغة لكل الحالات طبقا لمعايير الأشعة المقطعية في وصف الغدد الليمفاوية العنقيه و التى تشمل حجم الغدد و شكلها و النخر المركزي للغدد و التكلسات و درجة و نوع وضوحها بعد الصبغه وما إذا كان هناك امتداد للورم خارج الغدد الليمفاوية من عدمه. و كذلك روجعت صور الاشعه المقطعيه ايضا لتحديد المستوى العقدى و تحديد مراحل تطور الغدد العنقيه الخبيثه. و لقد أثبتت نتائج هذا البحث أن معايير الأشعة المقطعية الأكثر أهميه والتي أظهرت دلالة إحصائية فى تشخيص الغدد الليمفاوية العنقيه المتضخمه كانت شكل الغدد ووجود نخر مركزي بداخل الغدد المصابة و تعزيزها بالصبغه وو جود امتداد للورم خارج الغدد الليمفاوية. و بمقارنة نتائج الفحص بالأشعة المقطعية متعددة المقاطع و نتائج التحليل الباثولوجي في تشخيص و تقييم أمراض الغدد الليمفاوية العنقيه وجد انه ذو كفاءة وسرعة عالية في التشخيص حيث تصل نسبة حساسيته الى 92.3% و دقته في التشخيص إلى 90%. و لقد خلصت هذه الدراسه الى أن الأشعة المقطعية متعددة المقاطع تعد وسيله تشخيصيه حساسة ودقيقة لتقييم الغدد الليمفاوية العنقيه المتضخمه.