ISSN- O: 2458 - 868X, ISSN–P: 2458 – 8687
National Library of Medicine - ID: 101731606

International Journal of Medical Science and Innovative Research (IJMSIR)
IJMSIR : A Medical Publication Hub
Available Online at: www.ijmsir.com
Volume – 7, Issue – 6, November – 2022 , Page No. : 140 – 151

Role of Mdct in evaluation of neck masses and comparison with histopathology

[1]Dr. Ajay Khadiya, Senior Resident, Department of Radiodiagnosis, Gandhi Medical College, Bhopal, Madhya Pradesh, India.

[2]Dr. Mrs. Lovely Kaushal, Professor and Head, Department of Radiodiagnosis, Gandhi Medical College, Bhopal, Madhya Pradesh, India.

[3]Dr. Swati Goyal, Associate Professor, Department of Radiodiagnosis, Gandhi Medical College, Bhopal, Madhya Pradesh, India.

[4]Dr. Poornima Maravi, Associate Professor, Department of Radiodiagnosis, Gandhi Medical College, Bhopal, Madhya Pradesh, India.

[5]Dr. Vinod Parmar, Senior Resident, Department of Radiodiagnosis, L.N. Medical College, Bhopal, Madhya Pradesh, India.

Corresponding Author: Dr. Vinod Parmar, Senior Resident, Department of Radiodiagnosis, L.N. Medical College, Bhopal, Madhya Pradesh, India.

Citation this Article: Dr. Ajay Khadiya, Dr. Mrs. Lovely Kaushal, Dr. Swati Goyal, Dr. Poornima Maravi, Dr. Vinod Parmar, "Role of Mdct in evaluation of neck masses and comparison with histopathology", IJMSIR- November - 2022, Vol – 7, Issue - 6, P. No. 140 – 151.

Type of Publication: Original Research Article

Conflicts of Interest: Nil

Abstract

The neck is a complex region in human body having a wide anatomical area. Cancer of the head and neck is the sixth most frequent cancer worldwide in all ages. The clinical investigation has limited accuracy for the extent as well as size of head and neck tumours. Imaging has become essential in the characterization and staging of various neck masses. MDCT is currently one of the most powerful and versatile imaging techniques in the evaluation of neck masses. Currently, fine needle aspiration biopsy is the standard of diagnosis for neck masses. This study is an effort to assess the role of MDCT in detection, characterization and diagnosing neck pathologies, which may help in deciding further course of management, and findings will be correlated histopathologic ally. The present prospective cross sectional study was conducted in Department of Radiodiagnosis GMC Bhopal from 1st September 2021 to 31st August 2022 on a total of 70 patients presented with clinically suspected neck mass in various departments who were then referred for CT examination in Department of Radiodiagnosis. The study included 70 patients whose age ranged from 1 to 80 years. Overall, 49 patient were males and 21 patient were females with male to female ratio of 2.2:1. Majority of cases were between 41 to 50 years of age (15; 22%). Most common clinical complaint was neck swelling followed by non-

healing ulcers. Benign lesions were 21(30%) and malignant were 49(70%).

Among all the neck spaces, buccal space or oral cavity was the most common space to be involved. Most common overall lesion found is primary malignancies followed by lymph node pathologies. Bone erosion and vascular invasion noted in 12 (20%) and 2 (5%) patients respectively. The sensitivity, specificity, positive predictive value, negative predictive value and accuracy of our study is 93%, 66.6%, 81.6%,85.7%, 95% respectively. MDCT is very good imaging modality for diagnosis, extent and staging of lesion and provides excellent bony details by which we can differentiate benign from malignant lesion. Overall it has good sensitivity and specificity for diagnosis of lesion.

Keywords: Neck mass, primary malignancy, histopathology, vascular invasion, bone erosion.

Introduction

The neck is a complex region in human body and has a wide anatomical area, thus a detailed knowledge of neck anatomy is crucial to reaching a differential diagnosis.[1] It encompasses a wide variety of anatomical structures of different organ systems, and thus the swellings in the neck can be caused by innumerable pathological lesions arising from the various anatomical structures lying therein.[2] Cancer of the head and neck is the sixth most frequent cancer worldwide that presents in patients of all ages.[3] The clinical investigation alone is limited to accurately assess the extent as well as size of head and neck tumours, specifically submucosal extension of disease and extent of nodal metastasis.[4] With a detailed physical investigation and endoscopy, imaging has become essential in the characterization as well as staging of various neck masses. Causes of neck masses or swelling may be congenital, inflammatory, benign and malignant neoplasm. 90% of neck masses In children are benign out of which more than 95% are due to infection. In adult of more than 40 years of age, a malignancy may be found in more than 50% cases. In adult, 80% of neoplasm are non-thyroid, non salivary glands in origin and 80% neoplastic masses are malignant. [5] In addition to metastases from malignancies, commonly neck masses are cervical lymphadenopathy is one of the common causes of neck masses in our country due to the prevalence of tuberculosis.[6] MDCT is currently one of the most powerful and versatile imaging techniques in the evaluation of neck masses.[7] The other benefits are improved temporal resolution into arterial & venous phases, volume acquisition of data enabling convenient retrospective reconstructions, isotropic viewing and unlimited reformations leading to increased lesion conspicuity.[8] The utilization of MDCT has resulted in improved resolution and considerable reductions in scan acquisition and display time.[9] MDCT can be helpful in the evaluation of crossing the midline by small tumours of the palate or tongue base. However, CT utilizes hazardous ionizing radiations and iodinated contrast media which may be allergic and affects kidneys. [10] Currently, fine needle aspiration biopsy is the diagnostic standard of choice for neck masses. The main purpose of the head and neck imaging is to evaluate the exact extent of disease and to determine the best surgical and therapeutic needs for management. [10]

This study is an effort to assess the role of MDCT in detection, characterization and diagnosing neck pathologies, which may help in deciding further course of management, and findings will be correlated with histopathological examination.

Materials and methods

The present prospective cross sectional study entitled “Role of MDCT in evaluation of neck masses and comparison with histopathology” was conducted in

Department of Radiodiagnosis GMC Bhopal from 1st September 2021 to 31st August 2022 on a total of 70 patients presented with palpable neck swelling in various departments who were then referred for CT examination to the Department of Radiodignosis after obtaining informed written consent for the same.

Inclusion criteria

• Age: 1 to 80 years.

• Gender: Both

• Patients with complaints of palpable neck swelling based on clinical examination.

Exclusion criteria

• Patients not giving consent for the examination or study.

• Any previous facial or neck surgery.

• Elevated serum creatinine levels (>1.5 mg/dl)

• Patients having history of renal failure or insufficiency, allergic to iodinated contrast media.

• Patients less than one year of age, trauma and post-operative patients.

Methodology-Questionnaire-Socio-demographic details entered in questionnaire. Detailed clinical examination was done. Further CECT Neck imaging was performed for every patient.

Unenhanced and contrast enhanced CT scan of Neck All CT scans were performed on CT scanner present in our department. The scanning was done in suspended inspiration following hyperventilation. Dual phase CECT scan was performed using 1.5mg/kg of non-ionic iodinated contrast media duly administered at a flow rate of 2.5ml/sec from base of skull to thoracic inlet level.

Statistical analysis

Statistical analysis was done after collecting all necessary data and using proper statistical methods. Data was compiled using MS Excel. Descriptive and inferential statistics was applied. Diagnostic accuracy, sensitivity, specificity, NPV and PPV for CT were calculated and expressed as percentage.

Result and discussion

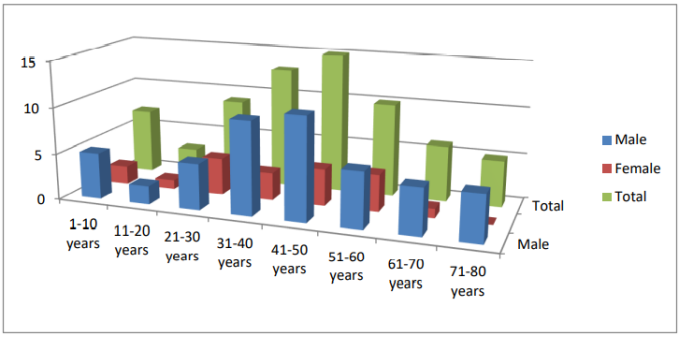
In our study, a total number of 70 patients were examined by CT scanner present in our department with unenhanced followed by enhanced CT scan of neck was performed of all patients. The findings of present study are described as under

Table 1: Age wise distribution of cases in both sex.

Age	Male	Female	Total
1-10 years	5	2	7(10%)
11-20 years	2	1	3(4%)
21-30 years	5	4	9(14%)
31 -40 years	10	3	13(18%)
41-50 years	11	4	15(22%)
51-60 years	6	4	10(12%)
61-70 years	5	1	6(12%)
71-80 years	5	0	5(8%)
Total	49	21	70(100%)

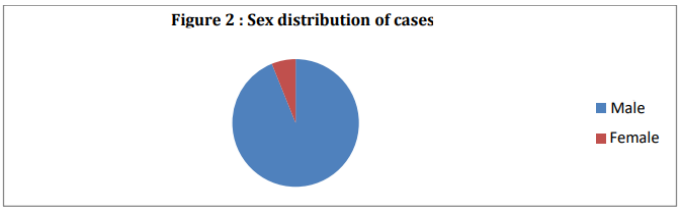
In our study total 70 patients were included. Majority of cases were between 41 to 50 years of age (15; 22%) (Table 1). The mean age was 41.6 years with range 1-80 years. Similar study done by Ravi et al shows that the age range was from 0 years to 80 years.[11] The most of patients were in 41-50 years (22%) age group followed by 31-40 years (18%) (Figure 1).

Figure 1 : Age and sex wise distribution of cases.



Charan et al found that the largest age group of patients with neck mass was in the age group 46-60 years (29%) followed by 31-45 years (24%) with higher incidence of malignant lesions between 46-60 Male Total 0 5 10 15 1-10 years 11-20 years 21-30 years 31-40 years 41-50 years 51-60 years 61-70 years 71-80 years Male Female Total years. [10] Shrestha et al in his study found that 29% of the patient of neck mass was in the age group 51-60 years followed by 41-50 years and then 61-70 years. [11]

Figure 2: Sex distribution of cases.



In our study majority of cases were males 49 (70%) while females were 21(30%) with male: female ratio of 2.2:1 (Table 1; Figure 1). In our study, the ratio of male to female is slight higher which was may be due to higher smoking and tobacco chewing history and behavioural status in male patients which leads to various cancer in face and neck regions. Study done by Charan et al shows that the male to female ratio is 2.1:1 and in the study by Ravi et al, of the total cases 66 cases were males with male to female ratio of 1.9:1. [10,8] In present study, most of the patients presented with complaint of neck swelling followed by non-healing ulcers which is consistent with study done by Charan et al who found neck swelling as commonest presentation in both benign (92%) and malignant (93%) lesions.[10]

Table 2: Distribution of different type of neck masses on basis of CT findings.

Type of lesion or mass	Number of cases	%
Lymph nodal mass	17	24.2
Developmental lesion	2	2.8
Inflammatory lesion	1	1.4
Vascular malformations	2	2.8
Thyroid lesions	4	5.7
Salivary gland lesions	3	4.2
Neuronal lesions	3	4.2
Primary head and neck malignancy	41	58.5
Others	7	10

In present study out of total 70 patients, lymph nodal mass were found in 17 patients, developmental lesions in 2 patients , inflammatory lesions in 1 patient, vascular malformation in 2 patients , thyroid Figure 2 : Sex distribution of cases Male Female lesions in 4 patients , salivary gland lesions in 3 patients , lesions of neuronal origin in 3 patients , primary malignancy in 41 patients while other lesions in 2 patients (Table 2). Out of 17 nodal masses, 6 were of tubercular lymphadenitis, 8 were secondaries and 3 cases were of lymphoma. Features of malignant lymph nodes could be predicted accurately on CT by radiological findings of rounded contour, absence

of hilum, eccentric cortical thickening, ill-defined margins with infiltration of surrounding structures and loss of fat planes or a combination of the above features Additional information provided by CT in the form of localizing the unknown primary elsewhere in the neck. Female preponderance was noted in thyroid masses. 3 patients had multinodular goitre, 1 patient had papillary carcinoma of thyroid showing micro calcification within. Two patients with vascular malformations were found in present study. 1 patient was of high flow vascular malformations demonstrating the feeding artery and draining vein and remaining one patient had lymphangioma showing well defined fluid attenuation lesion with multiple internal septations. Two patients with neck masses of developmental origin in our study shows 1 case was of branchial cleft cyst and another one of dermoid cyst in midline in suprasternal region. One patient presented with neck masses of inflammatory origin and had retropharyngeal abscess. The patient with retropharyngeal abscess on CT showed a fluid attenuation collection with peripheral enhancement in the retropharyngeal space with significant collection of air in the subcutaneous planes, masticator spaces, carotid spaces, visceral spaces, retropharyngeal and parapharyngeal spaces. Three patients had salivary gland lesions, two were benign which were diagnosed as pleomorphic adenomas and another one was of malignant parotid tumour. Three patients had nerve sheath tumours (vagal schwannomas), all three were in the carotid space showed mild contrast enhancement, displacing the carotid arteries anteriorly, internal jugular vein posteriorly indicating the lesion was of vagal nerve origin. Two patients showed miscellaneous lesions like lipoma, which was well defined lesions of fat attenuation, located most commonly in posterior triangle and another one patient had ameloblastoma. Fourty one patients showed primary malignant lesions originated from different spaces of neck. Study done by Thakkar et al shows that 34 cases (34%) were of malignant etiology, 24 (24%) were of benign etiology, 33 (33%) were of inflammatory etiology, 6(6%) were congenital and 3(3%) were of vascular etiology. [12] The findings were consistent with the findings of Shrestha et al. [11] The results of this study was consistent with the study by Ravi et al in which commonest neck masses were lymph nodal masses(32%).[8]

Table 3: Distribution of neck masses in various neck spaces under benign and malignant categories.

Neck space	No. of patients (%)	Benign (%)	Malignant (%)
Buccal space or oral cavity	26(37%)	0	26(53%)
Submandibular space	3(4%)	1(4.7%)	2(4%)
Parotid space	3(4%)	2(9.5%)	1(2%)
Pharyngeal mucosal space	5(7%)	0	5(10%)
Parapharyngreal space	1(1.4%)	0	1(2%)
Retropharyngeal space	1(1.4%)	1(4.7%)	0
Masticator space	1(1.4%)	1(4.7%)	0
Visceral space	6(8.5%)	3 (14.2%)	3(6%)
Anterior cervical space	12(17%)	6(28.5%)	6(12%)
Posterior cervical space	8(11.4%)	4 (19%)	4(8%)
Carotid space	4(5.7%)	3(14.2%)	1(2%)
Prevertebral space	0	0	0

In present study, among all the neck spaces, buccal space or oral cavity was the most common space to be involved in both, overall and in malignant lesion (37%; 53%) while anterior cervical space was the most common

space to be involved in benign (17%) (Table 3). Of the lesions involving the suprahyoid neck spaces the maximum number of lesions were noted in the buccal space or oral cavity (37%) followed by those in the pharyngeal space mucosal space (7 %). In the infrahyoid neck, the predominant lesions were noted in anterior cervical space (17%) followed by posterior cervical space(8%) and then visceral space (6%) (Table 3). It is found that more than one neck space has been occupied by many of the lesions. Dobrossy L did a study in the year 2005 in which the oral cavity was the most common site of lesion seen in 40% of patients and presented with complaints of non-healing oral ulcers. [13]Of the lesions involving the suprahyoid neck spaces, 7% of all lesions were encountered in pharyngeal mucosal space, of which 70% was squamous cell carcinoma in this study, consistent with the study done by Neel and Slavitt who reported squamous cell carcinoma to constitute adult nasopharyngeal malignancies. [14] Shrestha et al also found squamous cell carcinoma constituting 80% of pharyngeal mucosal space lesion.[11] In the study by Das Runa et al 34% of the patients had visceral neck space involvement, which included pyriform sinus, larynx, thyroid and esophageal.[15] A similar finding was noted in a study done by Mathur R et al in the year 2016 showing visceral space (31%) as the most commonly involved neck space. [6] The most common lesion occurring in the parapharyngeal space in the study by UmmeIffat S et al. [17]

Table 4: Distribution of neck masses into benign and malignant nature on basis of CT imaging findings.

Benign (n=21)	Lipoma	1
	Goitre	3
	Reactive lymph nodes	6
	Branchial cleft cyst	1
	Pleomorphic adenoma	2
	High flow vascular malformation	1
	Lymphangioma	1
	Schwannoma	3
	Dermoid cyst	1
	Ameloblastoma	1
	Retropharyngeal abscess	1
Malignant (n=49)	Metastatic lymph nodes	8
	Carcinoma Tongue	10
	Carcinoma buccal mucosa	14
	Carcinoma gingivo-buccal sulcus	2
	Carcinoma retromolar trigone	1
	Carcinoma alveolar/ mandible	1
	Carcinoma thyroid	2
	Carcinoma larynx	5
	Carcinoma esophagus	1
	Other primary malignancy	2
	Primary lymphoma	3

In our study, benign lesions were 21(30%) and malignant were 49(70%). TB lymphadenitis (28.5%) was the most common benign lesions followed by goitre (14.2%) and schwannoma (14.2%). The percentage of other benign lesions was less than 10%. Primary malignancy was the most common malignant lesions (>75%) followed by metastatic lymph nodes/ secondaries (16.3%). Among primary malignancies, carcinoma buccal mucosa was the

most common neck mass (28.5%) followed by carcinoma tongue (20.4%) and laryngeal malignancies. The percentage of other malignant lesions was less than 10%(Table 4).

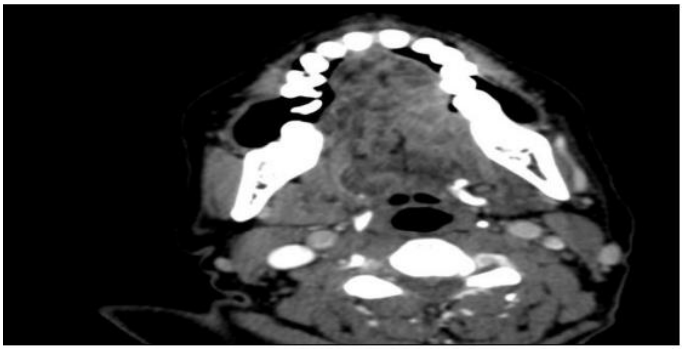


Figure 3: Carcinoma of tongue. Axial contrast enhanced CT scan showing an ill-defined heterogeneously enhancing lesion along left lateral border of tongue and seen extending to involve base of tongue and seen crossing midline. The lesion is abutting adjacent left side of body of mandible.

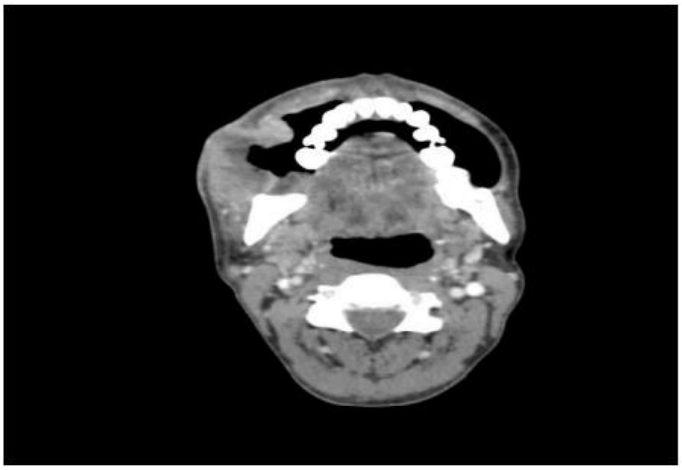


Figure 4: Carcinoma of right buccal mucosa. Axial contrast enhanced CT scan showing an ill-defined heterogeneously enhancing ulcero-proliferative lesion along right buccal mucosa and seen extending to involve right retromolar trigone and adjacent subcutaneous fat plane and overlying skin. The lesion is abutting adjacent ramus of mandible.

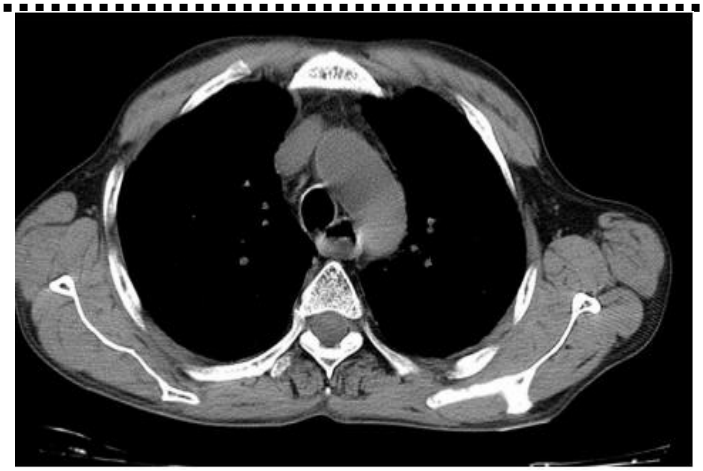


Figure 5: Carcinoma of esophagus. Axial contrast enhanced CT scan showing an ill-defined homogenously enhancing lesion in esophagus seen abutting left posterolateral wall of trachea and showing loss of fat plane with adjacent arch of aorta.

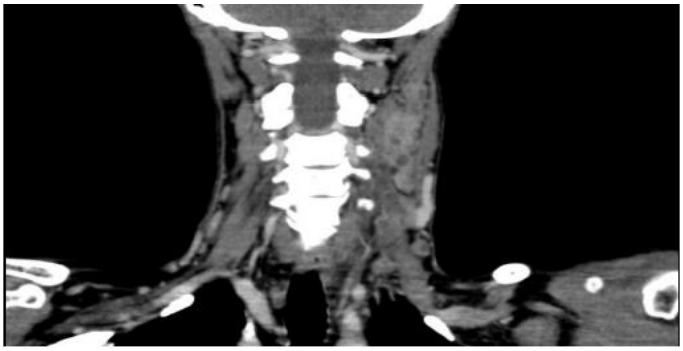


Figure 6: Metastatic lymph nodes. Coronal contrast enhanced CT scan section showing multiple heterogeneously enhancing lesion in the posterior cervical region with invasion into surrounding structures, consistent with metastatic lymph node secondary to unknown primary.

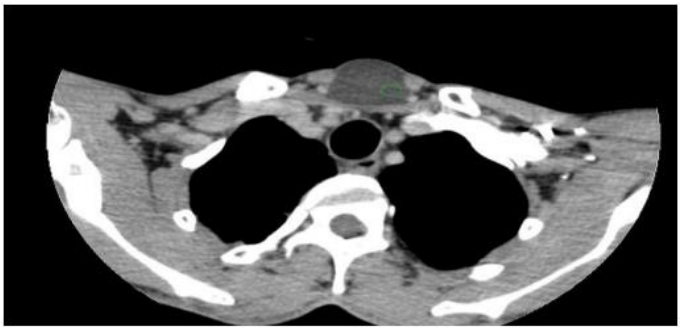


Figure 7: Dermoid cyst. Axial contrast enhanced CT scan showing a well-defined non enhancing lesion in anterior

aspect of lower neck at suprasternal region in mild line location showing characteristic fat attenuation.

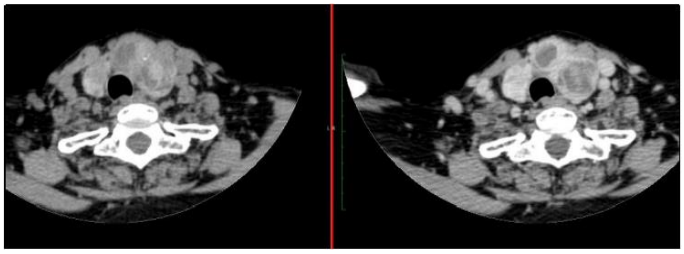


Figure 8: Multinodular goitre. Axial unenhanced and axial contrast enhanced CT scan sections showing bulky left thyroid lobe and isthmus with multiple heterogeneously enhancing nodules. The bulky left lobe is causing mass effect and pushing the trachea towards right and lateral displacement of the left carotid artery and internal jugular veins.

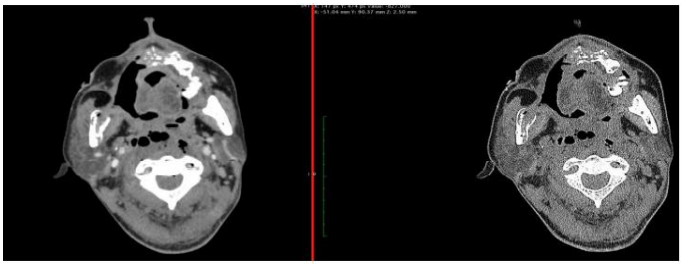


Figure 9: Retropharyngeal abscess. Axial contrast enhanced and axial bone window contrast enhanced CT sections showing an ill-defined peripherally enhancing central fluid attenuation lesion in the retropharyngeal space seen extending into various adjacent neck spaces.

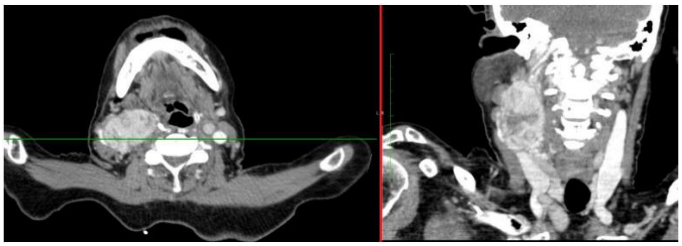


Figure 10: Right carotid body tumour. Axial and coronal contrast enhanced CT sections showing a well-defined heterogeneously enhancing lesion in right carotid space. It is causing splaying of right internal and external carotid arteries and posterior & lateral displacement with compression over left internal jugular vein.

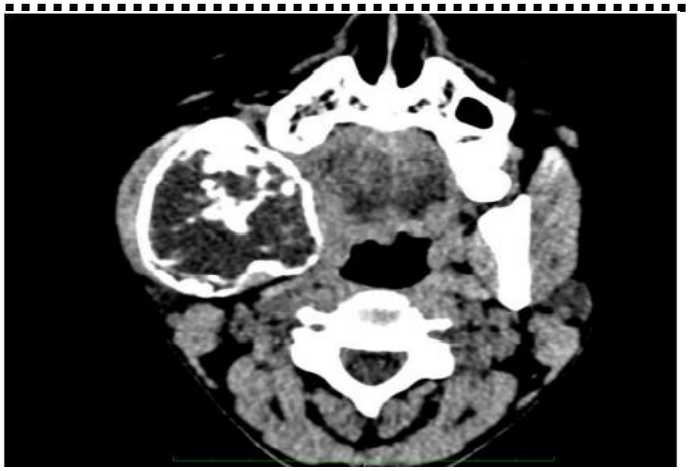


Figure 11: CECT axial section showing ameloblastoma of right side of mandible.

In the present study, a total of 14 patients with enlarged lymph nodes were encountered, 6 were in benign cases and 8 were in malignant cases. Based on size criteria and central necrotic area, CT differentiated benign and malignant lymph nodes with 96% sensitivity and specificity and an accuracy of 93%. Charan et al in his study found that in 47% patients with neck nodes the primary was known, while in nodal metastasis from unknown primary was identified in 13.7% of the malignant cases and lymph node was suspected as a primary site of malignancy in 8.3%, which was consistent with the present study. [10]

Three cases of schwannoma was reported in present study, which corresponds with Some et al who reported that schwannomas accounted for 80% of neurogenic tumours.[18] Boucher et al has reported abscesses in 96% of the cases involving the retropharyngeal space, which is consistent with present study.[19] Vander et al reported the incidence of colloid goitre to be 3-5% in the general population corresponding to present study.[20] Peel and Gepps reported 70-80% tumours involving the parotid gland to be pleomorphic adenoma, 30% mucoepidermoid and 28% adenocarcinoma, which largely corresponds with the present study.[21] Hughes et al in his study of 172 patients with parapharyngeal neoplasm found

pleomorphic adenoma (40%) as the commonest lesion.[22] While Bozza et al reported 66.6% as benign (pleomorphic adenoma) and 33.3 % as malignant squamous cell carcinoma (SCC) metastasis from occult primary and extending from tonsil region and adenocarcinoma of parotid.[23]

Most of malignant lesions were primary and most of them were present as localized swelling /neck swelling followed by non-healing ulcers. Study done by Thakkar et al shows that 34 cases(34%) were of malignant etiology, 24 (24%) were of benign etiology.[12] Most common primary malignant lesion in the neck was carcinoma of pyriform fossa (hypopharynx) 6 out of 34 cases (17.64%) and thyroid carcinoma 5 out of 34 cases (14.70%).[10] In the study by Lasrado et al, the most common site of primary malignant lesion in the neck was larynx(19.6%), followed by the thyroid(14.4%), the tongue and hypopharynx with 10.3% cases each.[24]]In present study, the malignant tumours involving larynx and hypopharynx were all squamous cell carcinoma, which corresponds to the study done by Becker, who reported over 90% of lesions in this space to be SCC. [25] Lymph nodes found to be the most common site to be involved in present study. He dinger et al in his study found papillary carcinoma accounting as 80- 90% of thyroid carcinoma, which also close to the present study finding. [26]

Table 6: Distribution of various characteristic imaging findings on CT in between malignant and benign lesions.

Imaging findings		Benign	Malignant	Total
Margins	Well defined	18(85%)	5(10%)	23(33%)
	Ill defined	3(15%)	44(90%)	47(67%)
Enhancement pattern	Homogenous	18(85%)	9(19%)	27(19%)
	Heterogenous	3(15%)	40(81%)	43(81%)
Necrosis	Present	6 (29%)	29(60%)	35(50%)
	Absent	15(71%)	20(40%)	35(50%)
Attenuation pattern / composition	Cystic	7(33%)	2(4%)	9(13%)
	Solid	9(42%)	40(81%)	49(70%)
	Mixed solid cystic	5(25%)	7(15%)	12(17%)
Adjacent soft tissue infiltration	+	2(9.5%)	44(90%)	47 (67%)
Vascular invasion	+	0	2(5%)	2 (3%)
Extension into adjacent neck space	+	3(15%)	10(20%)	13 (19%)
Bone erosion/involvement	+	0	12(25%)	12(17%)

In our study on CT imaging, most of the malignant lesions (44patient; 90%) show ill-defined margins while well-defined margins among malignant lesions has been found in 5 patients (10%). Most of the benign lesions show well defined margins (18 patients; 85%) while ill-defined margins among benign lesions has been found in 3 (15%) patients(Table 5).

In our study most of the malignant lesions appeared is Odense to hyperdense on CT imaging while most of the benign lesions were is Odense to hypodense on CT.

In our study most of the malignant lesions (81%) were solid in morphology on CT imaging while benign lesions were solid in 42%, cystic in 33% and mixed in rest of 25% cases(Table 5).

On CT imaging, heterogenous post contrast enhancement is noticed in > 80% cases of malignant etiology and also obliteration of fat plane or blurring of adjacent space in 90% malignant lesions while normal/ distinct fat plane seen in > 90 % benign lesions(Table 5). In a study by Das R et al heterogeneous enhancement was noted in 42 out of 50 primary lesions, heterogeneous enhancement found in 92.3% of malignant lesions, ill-defined margins in 32 (92.3%) patients, lymph nodes metastasis was seen in 22 out of 24 primary malignant lesions, infiltration of surrounding soft tissue was seen in 29 (88.46%) patients. Bone erosion and vascular invasion noted in 12 (20%) and 2 (5%) patients of the malignant lesions (buccal carcinoma, mandibular carcinoma, and l carcinoma of tongue) respectively (Table 5). Bone erosion found to be a highly specific feature for malignancy. CT features like irregular margin, surrounding soft tissue infiltration, etc were found to be statistically significant in differentiating malignant lesions from benign one.

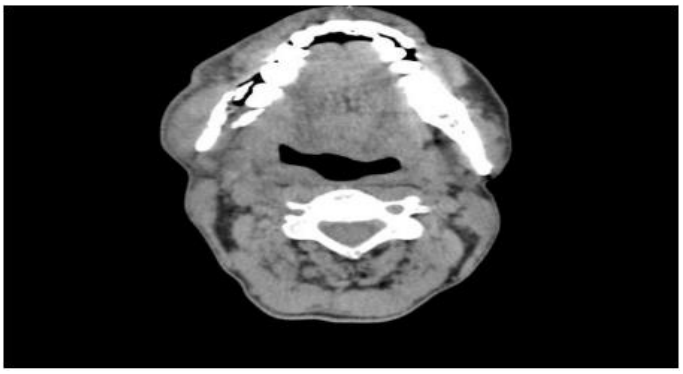


Figure 12 : CECT axial image shows characteristic bone involvement causing erosion of right side of body of mandible by malignant pathology.

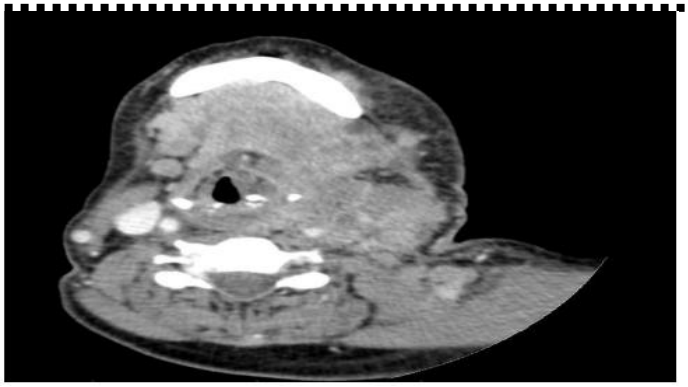


Figure 13 : CECT axial image shows characteristic vessel involvement in left carotid space by malignant pathology.

In our study, necrosis within lesion noted in 6 patients (29%) of benign etiology and 29 (60%) patients of malignant lesions (Table 5) which is nearly similar to study done by Reena M et al, in which necrosis was present in 80% of the malignant lesions. [16]

Extension into the adjacent space was seen in 3 (15%) cases of benign lesions (like retromandibular abscess , pleomorphic adenoma) and 10 (20%)cases of malignant lesions.

Kurabayashi T [27] in their study found 11 malignant lesions out of 53 with a sensitivity of 64% on the bases of margins, internal architecture and adjacent plane invasion on CT scan.

In the present study, the main differentiating features between benign and malignant lesions were margin, attenuation of lesions,

nature or consistency, calcification, necrosis, enhancement pattern of lesion, fat plane, vascular invasion, bone/cartilage erosion and lymphadenopathy regional and distant, were consistent with those described by David and Kathleen.[28]

Table 7: Distribution of diagnostic accuracy of CT.

		Histopathological Diagnosis		
CT Diagnosis		Benign	Malignant	Total
	Benign	18	3	21
	Malignant	9	40	49
	Total	27	43	70

GGGG In our study, the correlation between diagnosis detected on CT and histopathological diagnosis was significant ($p<0.001$)) when we compare both the modalities for diagnosing malignancy among neck masses. The sensitivity, specificity, positive predictive value, negative predictive value and accuracy of our study is 93%, 66.6%, 81.6%,85.7%, 95% respectively (Table 6). Mathur R et al in their study, mentioned a similar finding in CT differentiating benign and malignant lesions with a sensitivity of 96% and specificity and accuracy of 93%. [16]

Liao LJ in their meta-analytic review of various studies pooled an estimate in which sensitivity was 52%, and specificity was 93% for MDCT detecting malignant lesion. [29]

Conclusion

As MDCT accurately defines extent of lesions and involvement of adjacent structures thus it helps in the planning of further therapeutic management and the portal for radiotherapy as well. Diagnosis and staging of head and neck cancer is crucial in treatment.

MDCT is very good imaging modality for diagnosis, extent and staging of lesion. It has some advantages like easily available, cheap and provides excellent bony details as compared to MRI and give adequate information by which we can differentiate benign from malignant lesion but potential disadvantage is that it has radiation hazards but overall it has good sensitivity and specificity for diagnosis of lesion.

References

1. Harnsberger HR. Parapharyngeal space overview. In: Harnsberger HR, editor. Diagnostic imaging: head and neck. Altona (Canada): Amirsys; 2011.

2. Jindal U, Singh K, Baghla A, Kochhar A. Spectrum of Neck Swellings in the rural population Of India Based On Fine Needle Aspiration Findings. IJHNS. 2012; 5 (2):1-6.

3. Vogl TJ. Cervical adenopathy and neck masses. In : John. R. Hagga, et al. ed. CT and MRI of the whole body. Vol.1. 5th ed. Philadelphia: Mosby Elsevier, 1993: 639-67.

4. Alberico RA, Husain SH, Siro kin I. Imaging in head and neck oncology. Surg Oncol Clin N Am. 2004;13(1):13 -35.

5. Reibal JF. The Patient with a Neck Mass. Comprehensive Therapy. 1997; 23: 737-41.

6. Prasad KC, Sreedhar an S, Chakravarthy Y, Prasad SC. Tuberculosis in the head and neck: experience in India. The Journal of Laryngology & Otology. 2007 Oct;121(10):979- 85.

7. Push Pender G, Satish KB, Gopesh M, Vineeta R. Role of Multislice Spiral CT in the Evaluation of Neck Masses. JIMSA 2013; 26(1):51-4.

8. Ravi N, Lakshmeesha M T, Manjappa B H, Naveen K G, Ramesh V, Nagaraj B R. Does MDCT Really Have a Role in the Evaluation of Neck Masses? SSRG International Journal of Medical Science (SSRG-IJMS) 2015; 2 (3).

9. Gupta P, Bhargava SK, Mehrotra G, Rathi V. Role of multi-slice spiral CT in the evaluation of neck masses. Journal International Medical Sciences Academy. 2013; 26(1):51-4.

10. Charan I, Kapoor A, Kumar N, Jagawat N, Singhal, M.K., Kumar, H.S. Evaluation of neck Mass with Computed Tomography: An Observational Study. Int J Sci Stud. 2014; 2: 118-122.

11. Shrestha MK, Ghartimagar D, Ghosh A. CT evaluation of neck mass. J Nepal Med Assoc,. 2011; 51: 164-70.

12. Thakkar Dhaval K, Khaladkar S, Jantre M, Thakkar Dolly K, Singh A, Kulkarn Vilas M. IOSR Journal of Dental and Medical Sciences, 2015; 14 (8): 66-80.

13. Döbróssy L. Epidemiology of neck cancer: magnitude of the problem. Cancer and Metastasis Reviews. 2005; 24 (1):9-17.

14. Neel HB, Slavitt DH. Nasopharyngeal cancer. In: Baily BI, editor. Head and neck surgery : Otolaryngology. Philadelphia: JB Lippincott,. 1993; 1257-60.

15. Das Runa, Ghosh Aniruddha . Role of multi-slice spiralct in the evaluation of neck mass with cytological correlation. International Journal of Clinical and Biomedical Research, 2020;6(1):11-13.

16. Mathur R, Gupta A, Repswal R. Role of multidetector CT in evaluation of neck lesions. Journal of Evidence based medicine and healthcare 2016; 50 (3): 25 66 -63.

17. UmmeIffat Siddique, Bibek Ananda Halder ,Md. Rued Hossain, Shyamal Kumar Roy, Abdullah Al-Amin, Shohel Sultana. Evaluation of Neck Mass by Multidetector Computed Tomo graphy and His to patho logical Comparison.

18. Som PM, Sacher M, Stoll man AL, Biller HF, Lawson W. Common tumours of the parapharyngeal space: refined imaging diagnosis. Radiology. 1988; 169: 81-85.

19. Boucher C, Dorion D, Fisch C. Retropharyngeal abscesses. A clinical and radiological correlation. J Otolaryngeal. 1999; 28: 134-37.

20. Vander JB, Gaston EA, Dawber TR. The significance non-toxic thyroid nodules. Ann Intern Med. 1968; 69: 537- 40.

21. Peel RZ, Gnepp DR. Disease of the salivary glands In: Barnes L, editor. Surgical pathology of head and neck vol.1. New York: Marcel Dekker, 1985; 535-52.

22. Hughes KV, Olsen KD, McAffrey TV. Para pharyngeal space neoplasms. Head Neck. 1995; 17: 124-30.

23. Bozza F, Vigil MG, Rustico P, Marzetti A, Marzetti F. Surgical management of parapharyngeal space tumour: results of 10 year follow-up. Acta Otorhinolaryngol Ital. 2009; 29: 10-15.

24. Lasrado S, Prabhu P, Kakria A, Kanchan T, Pant S, Sathian B. Clinico-pathological Profile of Head and Neck Cancers in the Western Development Region, Nepal: A 4- Year Snapshot, Asian Pacific Journal of Cancer Prevention,2012; 12.

25. Becker, M. Larynx and Hypopharynx. Radiologic clinics of North America. 1998; 36: 891-19.

26. He dinger C. Geographic pathology of thyroid diseases. Pathology-Research and Practice. 1981; 171: 285-92.

27. Kurabayashi T, Ida M, Yoshino N, Sasaki T, Kishi T, Kusama M. Computed tomography in the diagnosis of buccal space masses. Dent maxillofacial Radiology. 1997; 26 (6):347-53

28. David MY, Kathleen M. Head and neck lesions. Radiologic–pathologic correlations. Radiologic clinics of North America. 1998; 36: 983-14.

29. Liao LJ, Lo WC, Hsu WL. Detection of cervical lymph node metastasis in neck cancer patients with clinically N0 neck-a metaanalysis comparing different imaging modalities. BMC cancer. 2012;12(1):236.