INTRODUCTION

Head and neck carcinomas are a global health problem with reported three- and five-year survival rate range from 46.2% to 82%. The prevalence of oral SCC is estimated to be 40% in South-East Asia. Particularly in Pakistan, it is the second most common malignant tumor with equal gender predilection. Identification of lymph node status is of most extreme significance in the assurance of poor forecast in head and neck tumor. The standard system for clinically positive (cN+) neck cases is radical neck surgery. Though, for clinically negative (cN0) neck cases, there are two lines of administration, either elective neck dissection or attentive holding up strategy. The diagnosis of cervical LNM arranged by palpation observed to be wrong. It is accounted that extent of mysterious cervical LNM is no less than 30% by straightforward palpation. Different reviews have revealed that affectability of single most suitable arranging strategy ought to be sufficient to diminish the rate of occult metastases to under 20%, i.e., a minimum negative prognostic value of more than 80%. Through this, unneeded management of histologically negative cases could be kept away from.

Past published studies thought about the diagnostic accuracy of various imaging techniques like magnetic resonance imaging (MRI), computed tomography (CT), positron emission tomography (PET), and ultrasonography (US) of the evaluation of lymph nodes status in neck area. However, these studies are combinations of cN+ and cN0 patients. No study has concentrated only on patients with cN0 necks, using a single most appropriate imaging modality. The aim of this study was to determine the accuracy of CT, in the evaluation of neck LNM in cN0 head and neck SCC patients.

METHODOLOGY

This descriptive cross-sectional study was conducted at Department of Radiology, Dow International Medical College, Dow University of Health Sciences, Karachi, Pakistan from October 2015 to April 2016.

All patients diagnosed on biopsy as SCC presented with clinical signs and symptoms of fungating oropharyngeal mass, oral ulcers, patch on oral and buccal mucosa lining and difficulty in chewing, moving jaw and tongue were enrolled in the study for the evaluation of tumor staging. MDCT was done as prescribed by the referral. All patients of either gender were included on the basis of age 18-75 years, histopathological or cytological proven primary squamous cell carcinoma of oral cavity,
oropharynx, larynx and hypopharynx with negative neck on clinical examination and diagnosed within 4 weeks. Exclusion criteria were patients diagnosed with histopathological or cytological proven primary squamous cell carcinoma of head and neck with positive neck on clinical examination, primary malignancy other than head and neck and patients in which CT is contraindicated (renal failure, diabetes mellitus, known allergy to intravenous contrast agents and pregnancy) and postoperative/chemotherapy/radiotherapy cases.

Computed tomography was performed on GE 16-slice CT scanner before and after intravenous contrast administration. Scan was performed in axial planes with coronal reconstructions. Nonionic iodinated contrast was given at a dose of 1.5 - 2.0 ml per kg.

CT studies were reviewed by a radiologist who was aware of the primary site of clinical presentation but unaware of the histopathology findings. The radiologist was asked to determine whether there was evidence of nodal metastasis in clinically neck negative patients. The criterion for nodal metastasis was rounded, hypoechoic nodes with or without central necrosis, extracapsular invasion and size >10 mm. After FNAC, specimens were fixed in 10% formalin solutions and decalcified for a period of 1-4 days. Pathologist, who was unaware of the imaging findings, reviewed the histopathologic material in all cases for evidence of cervical nodal metastasis in clinically non-palpable neck nodes.

This study was conducted after approval of synopsis from College of Physicians and Surgeons Pakistan (CPSP), as this is a dissertation based study. Institutional approval was also taken prior to conducting the study. In addition, informed consent was also taken from all study participants after explaining the pros and cons of the study.

Data were entered in SPSS version 17. Frequencies and percentages were calculated for all qualitative variables like gender, CECT findings, histopathological findings and anatomical lymph node level involved. Whereas, mean and standard deviation (SD) was calculated for all quantitative variables like age, duration of squamous cell carcinoma and axial diameter of involved lymph nodes. The diagnostic accuracy of CECT of head and neck was analyzed in terms of sensitivity, specificity, positive predictive value and negative predictive value against histopathology as the gold standard. Cases which did not undergo lymph node histopathology were excluded from the analysis.

RESULTS

Out of total 200 patients, 159 (79.5%) were males while 41 (20.5%) were females with mean age of 44.89 ±9.82 years (minimum 40 and maximum 60 years). Mean duration of symptoms was 2.43 ±0.90 months. Mean axial diameter of involved lymph nodes was 1.73 ±0.76 cm while majority of the patients (38%) had 2 anatomical lymph node level involvement.

The majority of the patients with oral cancers and cN0 showed occult cervical lymph node metastasis on CT scan (Figures 1 and 2). Out of 200 cases, histopathology of the cervical lymph nodes was performed in 186 patients. CECT findings showed that there were 48.5% positive cases while histopathology findings showed that there were 48.39% positive cases with sensitivity, specificity, NPV, PPV and overall diagnostic accuracy of 100%, 93%, 93%, 100% and 96.21% (Table I).

DISCUSSION

The finding of this study has showed prevalence of occult cervical LNM detection on CT scan in cN0 patients. The awareness is essential for understanding the extent of patients with a cN0 neck demonstrating that they possess no cancer cells in the cervical lymph nodes. Additionally, it is recommended that overtreatment of neck must be avoided for developing better examples of treatment of cN0 neck. Conversely, there remains an argumentative debate for selecting the optimal method to manage cN0 neck in SCC of the head and neck. A study conducted by Weiss et al. suggested that the chances of occult cervical metastasis are more than 20% with decision analysis; therefore, the treatment of neck must be based on elective procedure.
The comparison of distinctive imaging modalities was made by another meta-analysis, indicating that negative predictive rate for the post-test along with negative PET, CT, US and MRI findings can be augmented up to 86%, 82%, 84% and 84%, respectively. These findings indicate that the selection of watchful waiting policy is effective for such cases.

The most expensive imaging option available for nodal scrutiny is the PET examination but the outcomes of such specific tests did not endow effective specificity and sensitivity. Thereby, the effectiveness of PET exam is not persistently used in neck nodal status work-ups. The preference of CT is essentially determined for the treatment of cN0 neck and preoperative estimation due to the similar diagnostic sensitivities of CT and MRI to PET and US. Additionally, the similar diagnostic sensitivities can monitor primary tumor status at the same time. On the contrary, US is considered as a reasonable and convenient tool that explore nodal status. However, the primary tumor lesion and deep-rooted lymph nodes cannot be weighed through US.

The ability of multiple spiral CT imaging is determined to evaluate the structure of a large extent of tissue in a short time and concentrating specifically to the occurrence of 3D reconstruction. As affirmed from the advantages of such methods, number of criteria are set to consider the invasion of lymph node. Moreover, the major controversy for tumor invasion in a lymph node was headed due to central necrosis. The importance of size of the node is greatly revealed as direct correlation has been established between a 10 to 15 mm of lymph node size and tumor spread. It is evident that a borderline situation is created when a lymph node is at 10 mm or above; however, the consistency of at least three lymph nodes at same level justify tumor invasion, it can be observed in visualized images. The importance of lymph nodes relation with the surrounding tissue is further preferable and consistently reveal that invasion of lymph node is longer as the perinodal tissue is not persistently used in neck nodal status work-ups. The preference of CT is essentially determined for the treatment of cN0 neck and preoperative estimation due to the similar diagnostic sensitivities of CT and MRI to PET and US. Additionally, the similar diagnostic sensitivities can monitor primary tumor status at the same time. On the contrary, US is considered as a reasonable and convenient tool that explore nodal status. However, the primary tumor lesion and deep-rooted lymph nodes cannot be weighed through US.

Radiologists can easily determine the large lymph nodes tumor involvement when the boundaries of the lymph node levels are extensively established. The imaging-based classification was proposed by Som et al., which was not apparently implemented by all the radiologists. CT is found to be 95.3% accurate with 77% sensitivity and 99.4% specificity, especially in depicting small pathologic lymph nodes. A decreasing rate can be found in comprehensive survival rates due to unwanted and extended surgery. This indicates that invaded patterns of lymph nodes are required to appropriately evaluate and plan an effective diagnostic imaging approach. Additionally, restrictions have been explored for primary differentiation among malignant and benign nodes to the use of size. Therefore, it is important to develop a particular threshold extent that separates benign from malignant nodes. The metastasis is persistently observed with a traditional size approach, which specifically entails the microscopic and partial infiltration of the lymph node in the metastasis. The combination between PET and CT should be evaluated by future studies in order to develop a better understanding of predictive values as compared to regular imaging studies.

**CONCLUSION**

Computed tomography offers good diagnostic accuracy to define and diagnose cN0 neck rather than using expensive multimodality approach. It helps in deciding which surgical approach to be used minimizing morbidity, and avoiding elective neck dissection is acceptable in some select cases.

**Disclosure:** It is a dissertation-based article.

**REFERENCES**


