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Varshney Dr.Pallavi

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Assessment of Cervical Lymphadenopathy in Head and Neck Squamous Cell Carcinoma using Ultrasonic and Computed Tomographic Lymph Node Volume

Importance: Lymph nodal metastases is one of the most important prognostic factor in head and neck squamous cell carcinomas(HNSCC), despite of that its assessment and management is still controversial.

Objective: To compare the diagnostic utility of computed tomography (CT) and ultrasound (USG) using different parameters with special emphasis on lymph nodal volume.

Design: Prospective study with cases included for period of 1 year from June 2019 to September 2020.

Setting: Study done in a tertiary health care centre.

Participants: 30 patients with squamous cell primary tumours of head and neck planned for a neck dissection, with age ranging from 18 to 75 years participated in the study. Preoperatively 87 lymph nodes were selected and analysed.

Exposures: All patients underwent preoperative assessment in the form of USG and contrast enhanced computed tomography of the neck, after the evaluation excision of the primary tumour with neck dissection was done.

Main Outcomes and Measures: Primary outcome measures included sensitivity, specificity, accuracy, positive and negative predictive value. A receiver operator curve was plotted for lymph nodal volume on CT to calculate the cut off value and accuracy.

Results: Total 30 participants, 24 males and 6 females with mean age of 52.7 years. The median volume on CT was found to be 5412.15 mm³ for metastatic nodes and 237.73 mm³ for benign nodes and on ultrasound it was 4168.92mm³ for metastatic and 233.10mm³ for benign nodes ($p < 0.001$).

The sensitivity, specificity, accuracy, PPV and NPV for volume on USG were 81.8%, 98.7%, 96.6%, 90% and 97.4% and on CT were 81.8%, 100%, 97.7%, 100% and 97.4% respectively. In the receiver operator curve analysis of volume on CT scan, the total area under curve was 0.959 (standard error 0.032 and 95% CI) and the cut off was found to be 1337.94 mm³.

Conclusions and Relevance: According to the results of our study lymph nodal volume had relatively higher sensitivity and specificity in determining nodal metastasis and individually or in combination should be included as one of the criteria in pre-operative assessment of HNSCC.