Texas Society of Neuroradiology (TSNR)
Educational Abstract
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Malignant Cervical Lymph Nodes: Key Imaging Features on Ultrasound, CT, and PET/CT

Ceylan Altintas Taslicay[1,2], MD; Salmaan Ahmed[2], MD; Diana Kaya[2], MD

[1]UT Southwestern Medical Center, Neuroradiology Department, TX, USA

[2]MD Anderson Cancer Center, Neuroradiology Department, TX, USA

Summary

This educational, imaging-rich presentation provides a multimodality review of malignant cervical lymph nodes using ultrasound, CT, and PET/CT. Through pathologically confirmed cases, it highlights cervical nodal level classification, typical metastatic pathways of head and neck and select non–head and neck primaries, and key imaging features that distinguish malignant from benign adenopathy. Emphasis is placed on common diagnostic pitfalls, characteristic findings across different tumor types, and the complementary role of each imaging modality, with a brief overview of ultrasound-guided lymph node biopsy. This exhibit is designed for radiology residents, fellows, general radiologists, and subspecialists involved in head and neck imaging, aiming to enhance diagnostic accuracy and confidence in clinical practice.

Educational Objectives

1. Identify cervical lymph node levels and recognize typical metastatic nodal distribution patterns associated with common head and neck and selected non–head and neck primary malignancies.
2. Differentiate malignant from benign cervical lymph nodes on ultrasound, CT, and PET/CT based on key imaging features beyond nodal size alone.
3. Apply multimodality imaging findings to guide clinical decision-making, including selection of appropriate nodes for ultrasound-guided biopsy.

Purpose

Nodal metastasis is found in 37-49% of head and neck malignancies. Assessment of malignant lymph nodes is important for the initial staging, management, prognosis and surveillance of head and neck cancers. The purpose of this imaging- rich presentation is:

1. To review imaging-based level-based classification of cervical lymph nodes.
2. To describe the distribution and common nodal metastatic sites for various head and neck primaries, as well primaries outside of the head and neck.
3. To illustrate the imaging characteristics of cervical adenopathy on US, CT and PET CT for different type of head and neck malignancies
4. To briefly review US-guided biopsy of lymph nodes.

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Materials and Methods

We are using imaging studies of pathologically confirmed cases. The characteristic imaging features of metastatic lymph nodes from different head and neck primaries will be described and illustrated across multiple imaging modalities. The key imaging features of metastatic lymph nodes from aerodigestive tract malignancies, thyroid cancer, malignant melanoma, non-melanoma skin cancer, salivary gland cancer and lymphoma will be described.

Results

a. Nodal size alone is not an accurate criterion for differentiating normal lymph node from metastatic or lymphoma nodes.
b. Preservation of echogenic hilum is not an exclusion criterion for metastatic adenopathy.
c. Combination of normal architecture with focal heterogeneity, cortical bulge or abnormal contour can be signs of metastatic lymph nodes.
d. Papillary thyroid carcinoma's nodal metastasis is characterized by cystic changes, calcifications, and hyperechoic components related to the deposition of colloid or hemorrhage.
e. Cystic adenopathy may be seen in p-16 positive oropharyngeal cancers and thyroid papillary carcinoma.
f. Metastatic lymph nodes form malignant melanoma are usually hypoechoic, round shaped, and can preserve normal architecture.

Conclusion

US, CT, MRI, and PET CT are complimentary modalities in the evaluation of metastatic lymph nodes. Location and appearance of lymph node on imaging can lead to a diagnosis.

References

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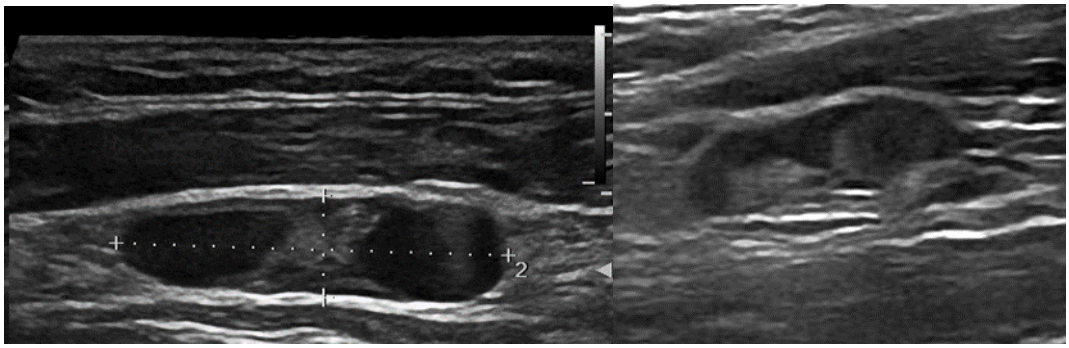
Figures

Figure 1. Imaging features of metastaic papillary thyroid carcinoma showing

a) Cystic changes **b) Focal heterogeneity**



c) Microcalcifications **d) Hyperechoic content**