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CLINICAL PRESENTATION AND RADIOLOGY QUIZ QUESTION

A 64 year old woman is a chronic cigarette smoker and has a new left neck mass that is superior and separate from the thyroid gland. What is the most appropriate imaging study for soft tissue masses in the neck which are separate from the thyroid gland?

(a) CT of the soft tissues of the neck
(b) plain films of the cervical spine
(c) ultrasound of the carotid arteries
(d) ultrasound of the thyroid gland

RADIOLOGY QUIZ QUESTION, ANSWER, AND EXPLANATION

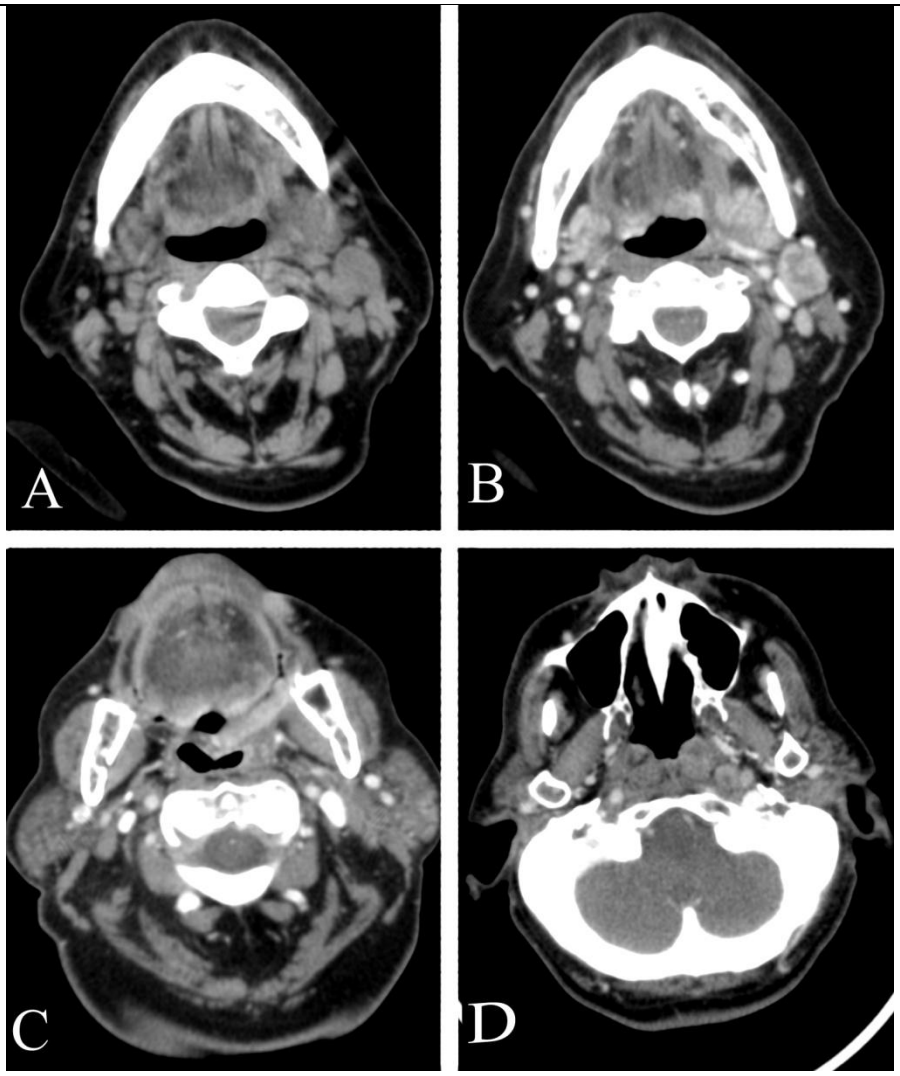
A 64 year old woman is a chronic cigarette smoker and has a new left neck mass that is superior and separate from the thyroid gland. What is the most appropriate imaging study?

(e) CT of the soft tissues of the neck
(f) plain films of the cervical spine
(g) ultrasound of the carotid arteries
(h) ultrasound of the thyroid gland

Answer: (a), CT of the soft tissues of the neck. In adults with new neck masses, particularly smokers past the age of 50, the main concern for such masses is that they represent metastatic lymph nodes from squamous cell cancer arising in the pharyngeal mucosa. CT can generally determine if there are pathologically enlarged nodes, and can sometimes determine if there is a primary tumor of the mucosa. CT is also helpful to exclude other causes of palpable neck masses such as carotid artery aneurysms, carotid body tumors, osteophytes of the cervical spine, and developmental cysts of the neck. MR is also excellent at evaluation of soft tissue masses, and may be used instead of CT as the initial study of choice for evaluation of neck masses in some radiology departments.

Plain films of the cervical spine are generally obtained either in the setting of acute trauma or in initial evaluation of neck pain suspected to be secondary to degenerative change. Plain films are not helpful in evaluation of palpable soft tissue masses in the neck, and (b) is incorrect. Ultrasound of the carotid arteries is generally used to evaluate for a vascular cause of neurologic symptoms, which relies quantification of any carotid artery stenosis. Ultrasound of the carotid arteries is generally not helpful in evaluation of palpable neck masses, and (c) is incorrect. Ultrasound of the thyroid gland is usually performed to evaluate for palpable lesions of the thyroid (although the utility of this imaging has been questioned), and in this case the patient had a mass that was superior and separate from the thyroid gland; therefore (d) is incorrect.

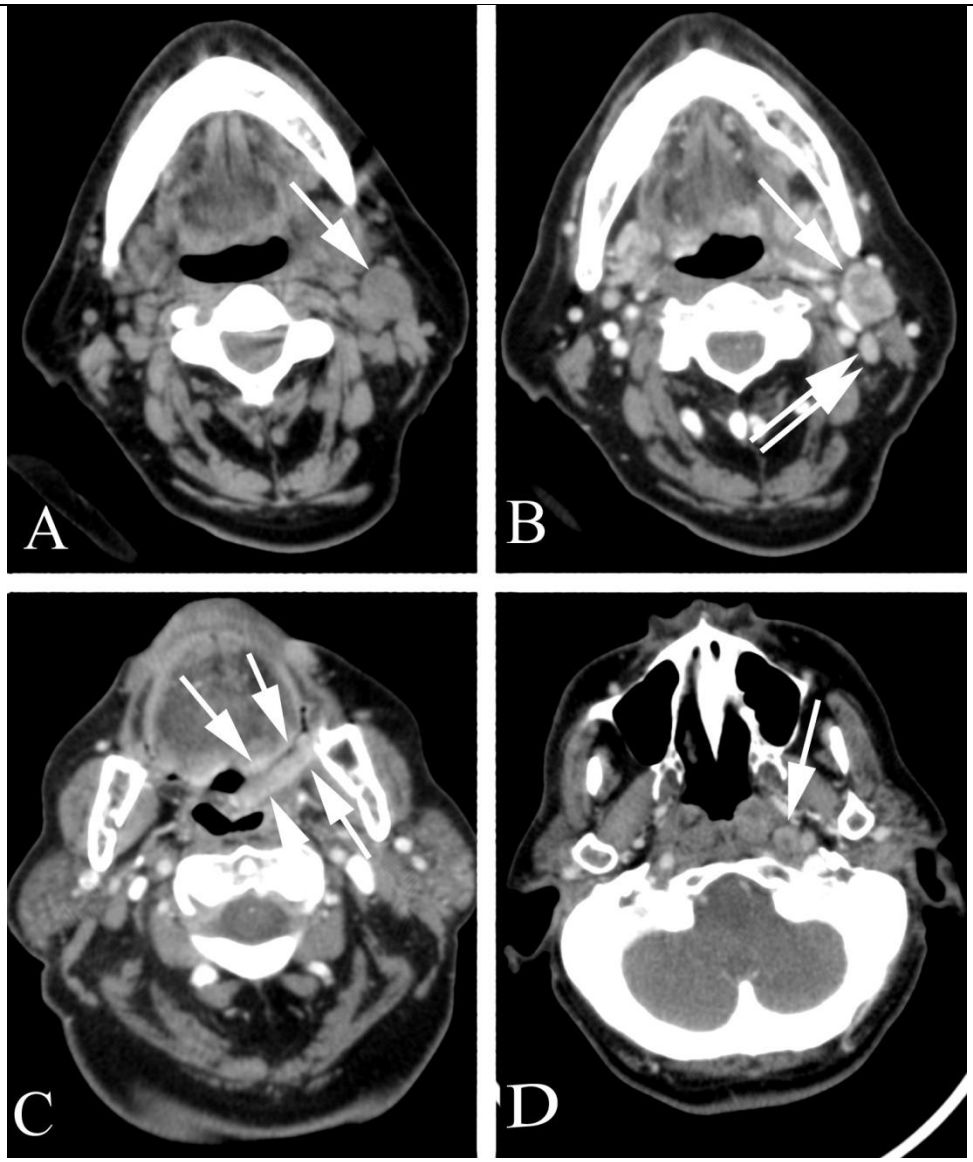
IMAGING STUDY AND QUESTIONS



Imaging questions:

1) What type of study is shown in the figure?
2) Are there any abnormalities?
3) What is the most likely diagnosis?
4) What is the next step in management?

IMAGING STUDY QUESTIONS AND ANSWERS

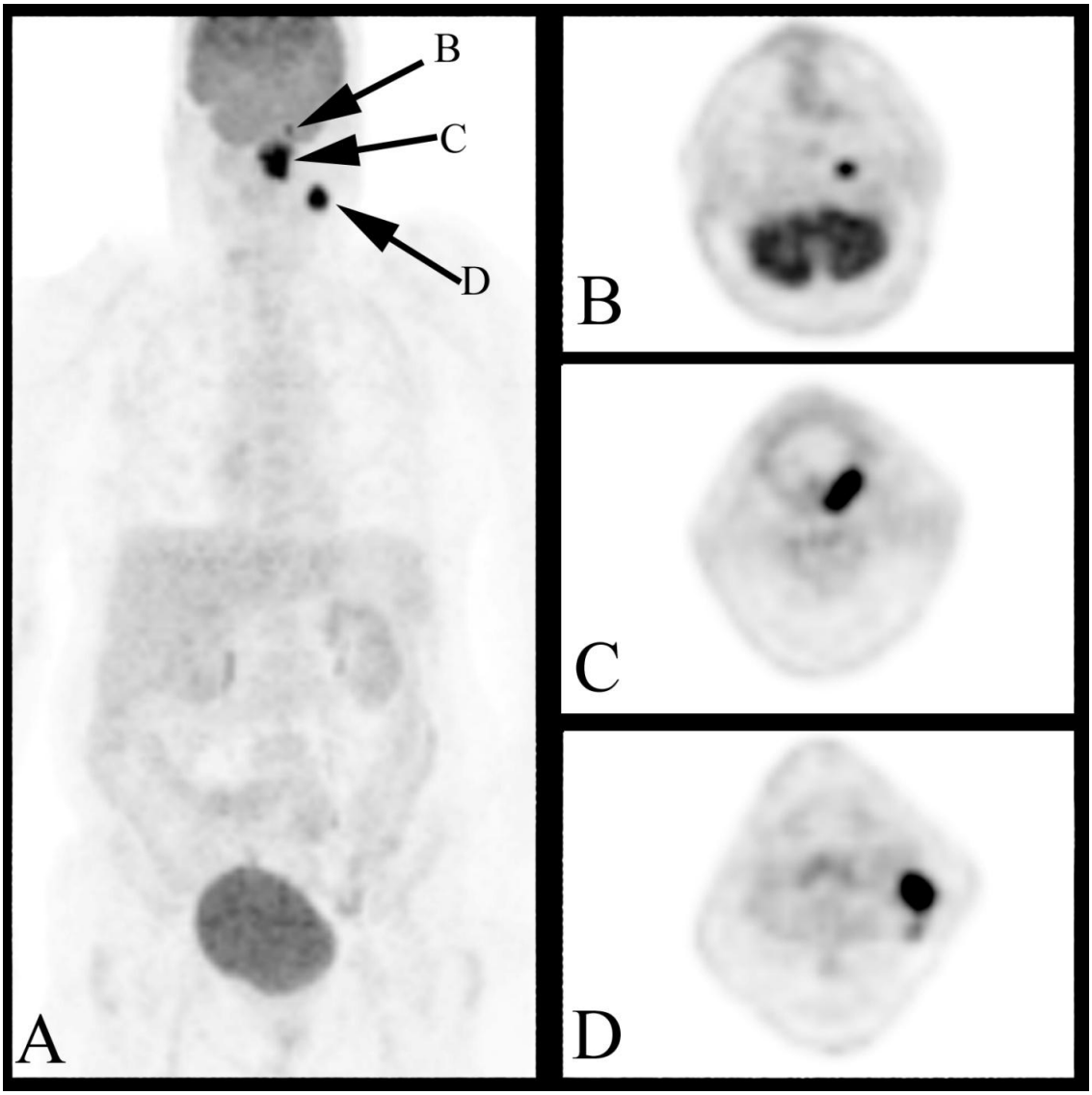


1) What type of study is shown in the figure? A neck CT exam (A is done without contrast, B, C, and D with intravenous contrast).
2) Are there any abnormalities? The single arrows in A and B points to an enlarged, inhomogeneously enhancing lymph node at the angle of the mandible (the jugulodigastric node); the double arrows in B point to an additional (borderline enlarged) node. The arrows in C delineate a mucosal lesion of the left oropharynx. The arrow in D points to an additional abnormal lymph node adjacent to the left distal extracranial internal carotid artery.
3) What is the most likely diagnosis? Squamous cell carcinoma with metastases.

4) What is the next step in management? Referral to an ororhinolaryngologist for biopsy and treatment.

PATIENT DISPOSITION, DIAGNOSIS, AND FOLLOW-UP

Six weeks prior to the patient's CT scan of the neck, she came to her primary care provider seeking counseling for alcohol and tobacco abstinence. She noted that she had a "sore" in her mouth. Physical examination demonstrated a visible lesion along the left soft palate extending along the buccal mucosa,retromolar trigone, and to the base of the tongue, which was painful when touched with a tongue depressor. She was referred to an otorhinolaryngologist for further evaluation who performed a biopsy of the lesion and noted a palpable mass in the left neck. The biopsy returned poorly differentiated squamous cell carcinoma. The patient also had a prior history of uterine cancer. Subsequently, the patient underwent a staging PET-CT study (see figure on the next page) which confirmed hypermetabolism in the patient's primary lesion as well as the two abnormal lymph nodes. No distal metastases were identified.



64 year old woman with a palpable neck mass representing metastatic squamous cell carcinoma from the oropharyngeal mucosa. A. Global fluorodeoxyglucose (FDG) positron emission tomography (PET) image shows three lesions of the head and neck. Note normal activity in the brain and bladder. B. Axial FDG PET image obtained at the skull base (note normal brain activity along the posterior image), corresponding to the abnormal skull base lymph node seen on the neck CT study (D in the earlier figure). C. Axial FDG PET image obtained at the level of the mucosal lesion showing intense hypermetabolism in the primary tumor. D. Axial FDG PET image obtained at the level of the abnormal neck nodes showing intense hypermetabolism in the larger anterior and smaller posterior node.

SUMMARY

Presenting symptom: Neck masses in adults are typically divided into thyroid and non-thyroid masses. While there is ongoing controversy with respect to imaging and biopsy of thyroid lesions, at least some sources indicate that the most cost-effective method of management of suspicious palpable thyroid lesions is a percutaneous fine needle aspiration biopsy (FNAB), with additional steps depending on the biopsy results. Non-thyroid masses in adults, especially in smokers or those over the age of fifty, need to be considered malignant until proven otherwise. Childhood neck masses are not discussed here and have a completely different set of causes and workup.

Imaging work-up: Most adult neck masses of unknown origin require CT for characterization. The CT scan will usually differentiate such unusual lesions as lipomas and congenital/developmental cysts from the more frequently encountered pathologic lymph nodes. Large lymph nodes may be encountered in lymphoma or secondary to metastatic deposits from squamous cell carcinoma arising in the pharyngeal mucosa, and in either of these cases the CT may offer clues to the diagnosis as well as confirming the solid nature of the imaged lesion.

Establishing the diagnosis: The diagnosis usually requires biopsy. In the case where there are enlarged lymph nodes, the the mucosal surfaces will usually undego direct inspection by an otolaryngologist, who will take appropriate biopsies at the time of the inspection.

Take-home message: Adults with non-thyroid neck masses will usually require a CT scan of the neck for evaluation.

FURTHER READING

Lin D, Deschler DG. Evaluation of a neck mass. UpToDate, accessed 10/10/09.

Renfrew, DL. Cranial nerves, sinuses, and neck masses. Chapter 5 of *Symptom Based Radiology*, Symptom Based Radiology Publishing, Sturgeon Bay, WI, 2010, available for no charge at www.symptombasedradiology.com.

Slovik DM. Evaluation of thyroid nodules. Chapter 95 in Goroll AH and Mulley AG (editors) Primary Care Medicine: Office Evaluation and Management of the Adult Patient, 6th edition, Lippincott Williams & Wilkins, Philadelphia, 2009.