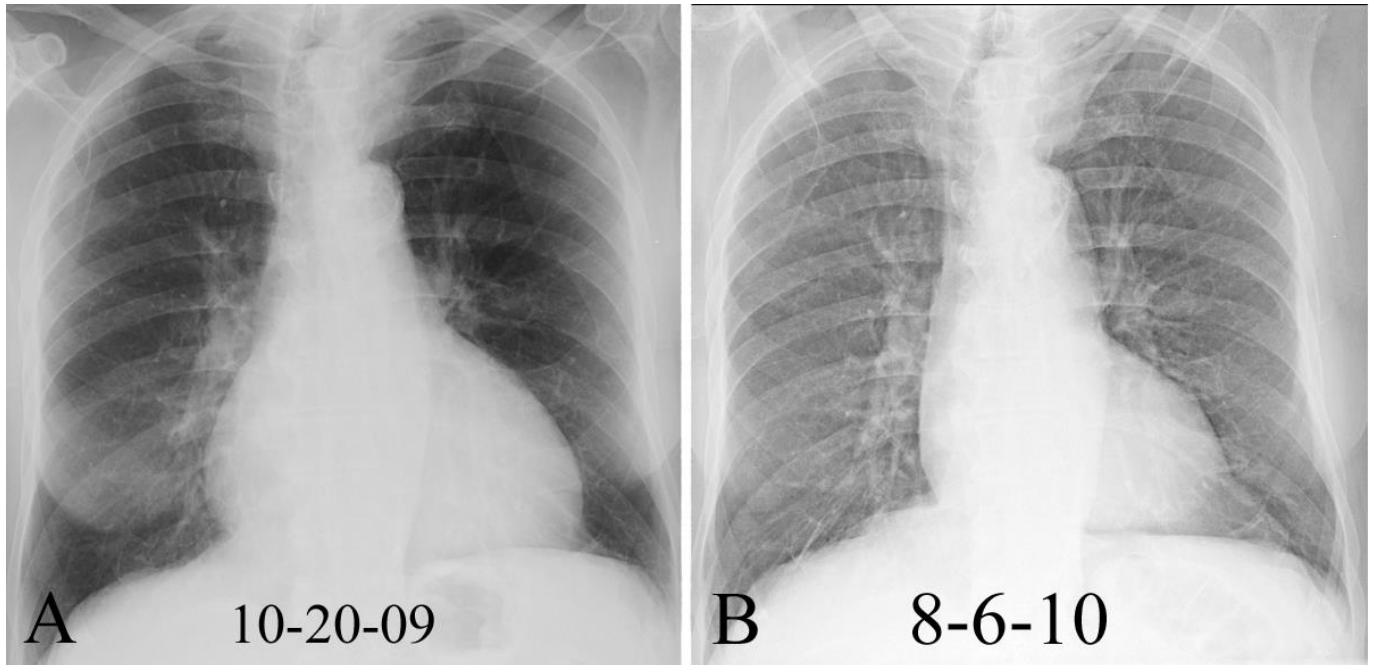


CLINICAL PRESENTATION AND RADIOLOGY QUIZ QUESTION

A 84 year old man has multiple medical problems, including chronic cough. Chest plain films have been obtained, including the following:

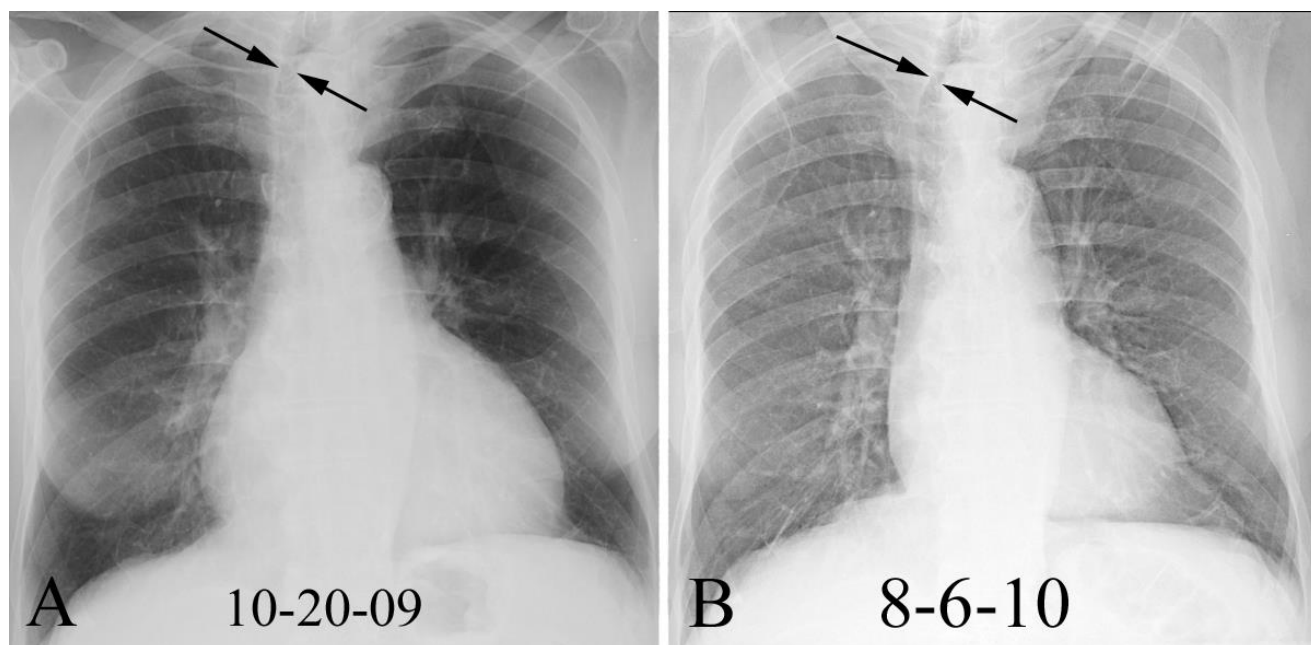


Which of the following is *true*?

- (a) there are no significant abnormalities on the chest radiograph to explain cough
- (b) there is an abnormality and computed tomography (CT) of the chest would be the most useful next imaging study in evaluation
- (c) there is an abnormality and a magnetic resonance (MR) examination would be the most useful next imaging study in evaluation
- (d) there is an abnormality and follow-up plain films in 3 – 6 months would be the most useful next imaging study in evaluation

RADIOLOGY QUIZ QUESTION, ANSWER, AND EXPLANATION

[For the patient history and question, see Page 1.]



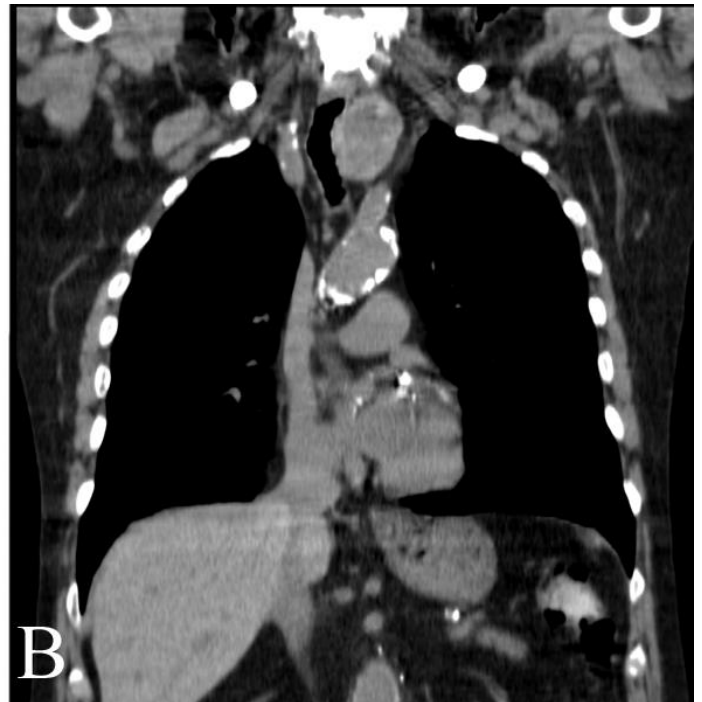
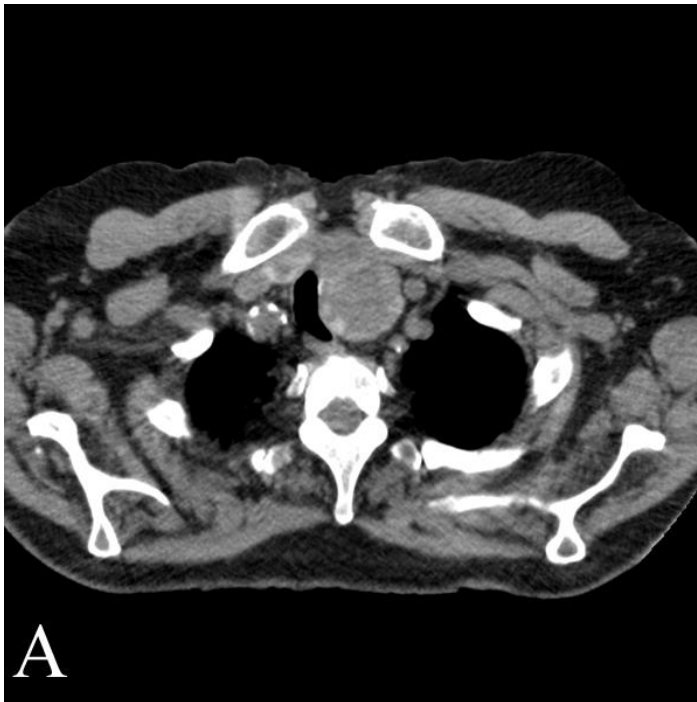
67 year old with recurrent cough. A. PA chest radiograph from 10-20-09 shows cardiomegaly and indentation/narrowing of the trachea in the superior thorax (arrows). B. PA chest radiograph from 8-6-10 shows apparent progressive narrowing of the superior trachea (arrows).

Answer: (b), there is abnormality and computed tomography (CT) of the chest would be the most useful next imaging study in evaluation, is the correct answer. There is distortion of the superior trachea which appears to show progression when comparing the two studies.

There is, in fact, a significant abnormality on the chest radiograph which *may* explain cough, and thus (a) is not the correct answer. Computed tomography, and not magnetic resonance examination, is the most useful next step in evaluation of the abnormality, and thus (c) is not the correct answer. Since the trachea shows a significant decrease in caliber, it does not appear reasonable to wait for further evaluation, and (d) is not the correct answer.

IMAGING STUDY AND QUESTIONS

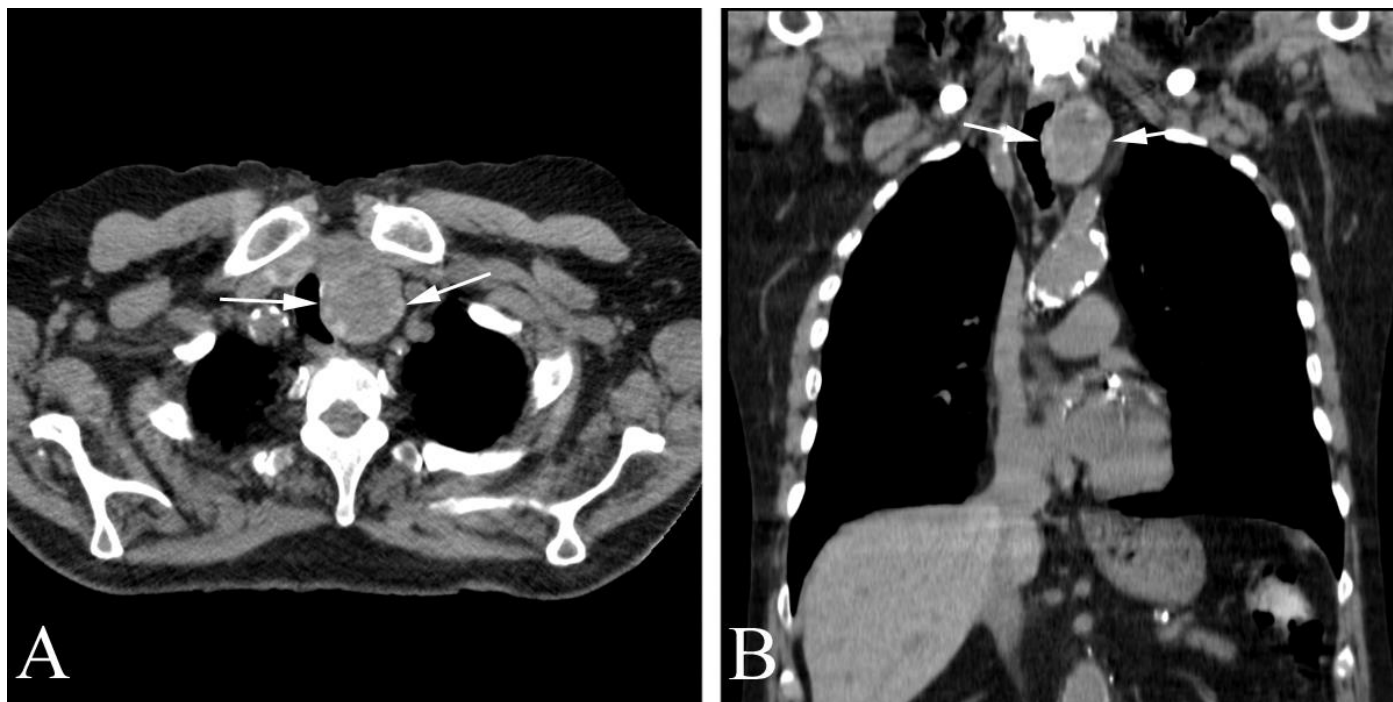
The patient underwent a procedure:



Imaging questions:

- 1) What type of study is shown?
- 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



Imaging questions:

- 1) What type of study is shown? A contrast enhanced chest CT. A is an axial study done through the lung apices filmed on soft tissue windows, and B is a coronal study in the plane of the proximal trachea filmed at soft tissue windows.
- 2) Are there any abnormalities? Yes. There is a large, heterogeneous soft tissue mass distorting and displacing the trachea (arrows)
- 3) What is the most likely diagnosis? While the imaging features are not tissue specific, the lesion most likely represents inferior extension of a thyroid mass.
- 4) What is the next step in management? Comparison with any prior CT studies, thyroid ultrasound examinations, or biopsy results.

PATIENT DISPOSITION, DIAGNOSIS, AND FOLLOW-UP

Upon further review, the patient had undergone a work-up for his thyroid abnormality six years previously including fine needle biopsies of the gland which were negative for malignancy, and had a diagnosis of chronic goiter. Due to several ongoing medical problems, he was not felt to be a good candidate for treatment of the goiter. As is often the case in chronic cough, it is difficult to say with certainty what the cause of the cough was, although it is likely that distortion and narrowing of the trachea caused by the patient's goiter likely contributed to the symptom.

SUMMARY

Presenting symptom: The patient had chronic cough. Chronic cough is most often caused by post-nasal drip, gastro-esophageal reflux disease, and asthma. Evaluation of patients with chronic cough typically involves eliciting any subtle symptoms or findings of these three processes, followed by either laboratory testing or sequential trials of treatment for each of the three.

Imaging work-up: As noted in Radiology Quiz of the Week #57, #58, and #59, the first imaging study of choice for evaluating ambulatory patients with cough is a chest radiograph. In those cases when the plain film demonstrates an abnormality that needs further characterization, as was the case in this patient, the next step in imaging is typically a CT scan. When the plain film is negative and when the three main causes (post-nasal drip, gastro-esophageal reflux, and asthma) have been excluded, CT may be performed but is unlikely to demonstrate a causative abnormality (such as interstitial lung disease or tumor not visible on radiography) in a minority of cases.

Establishing the diagnosis: Palpable thyroid masses, or thyroid masses larger than 15 mm on imaging, typically undergo biopsy.

Take-home message: Chronic cough is usually caused by post-nasal drip, gastro-esophageal reflux disease, or asthma. Chest radiographs are nearly always obtained but are usually negative. Chest CT should be performed if the chest radiographs demonstrate an abnormality requiring further imaging. CT may also be performed if other causes of cough have been excluded, but is usually normal or shows no obvious cause of cough in such patients.

FURTHER READING

Goroll AH and Mulley AG. "Evaluation of subacute and chronic cough" Chapter 41 in *Primary Care Medicine: Office Evaluation and Management of the Adult Patient*, 6th edition, Lippincott William & Wilkins.

Porter RS (Editor). Cough in adults. Chapter in *The Merck Manual of Patient Symptoms*, Merck & Company, Whitehouse Station, NJ 2008.

Renfrew, DL. Cough, dyspnea, and lung nodules. Chapter 10 of *Symptom Based Radiology*, Symptom Based Radiology Publishing, Sturgeon Bay, WI, 2010, available for no charge at www.symptombasedradiology.com.

Seller RH. Cough. Chapter 9 in *Differential Diagnosis of Common Complaints*. Saunders, 2000, Philadelphia.

Silvestri RC, Weinberger SE. Evaluation of subacute and chronic cough in adults. UpToDate, accessed 9/14/09.