

AMSER Case of the Month: January 2019

Mediastinal Mass

Paige Tannhauser, MS-4, Drexel University College of Medicine

Dr. Matthew Hartman MD, Allegheny Health Network

Dr. Jeffrey Mueller MD, Allegheny Health Network

Dr. Don Nguyen MD, PGY-4, Allegheny Health Network



Patient Presentation

- HPI: 82 yo M admitted as a transfer from OSH for SOB, CHF and CP. Recently placed IABP. Denies N/V, fevers, chills, weight loss, difficulty swallowing.
- PMHx: essential HTN, nodular goiter, CHF, CAD
- PSHx: no past surgical history
- FHx: Mother: heart disease (unspecified), Father: cancer (unspecified)
- SHx: lives alone, relatively active, never smoker, denies smokeless tobacco use, denies alcohol use, denies drug use
- Meds: ASA, lisinopril

What Imaging Should We Order?

ACR Appropriateness Criteria

American College of Radiology
ACR Appropriateness Criteria®
Dyspnea–Suspected Cardiac Origin

Variant 1: Dyspnea due to heart failure. Ischemia not excluded.

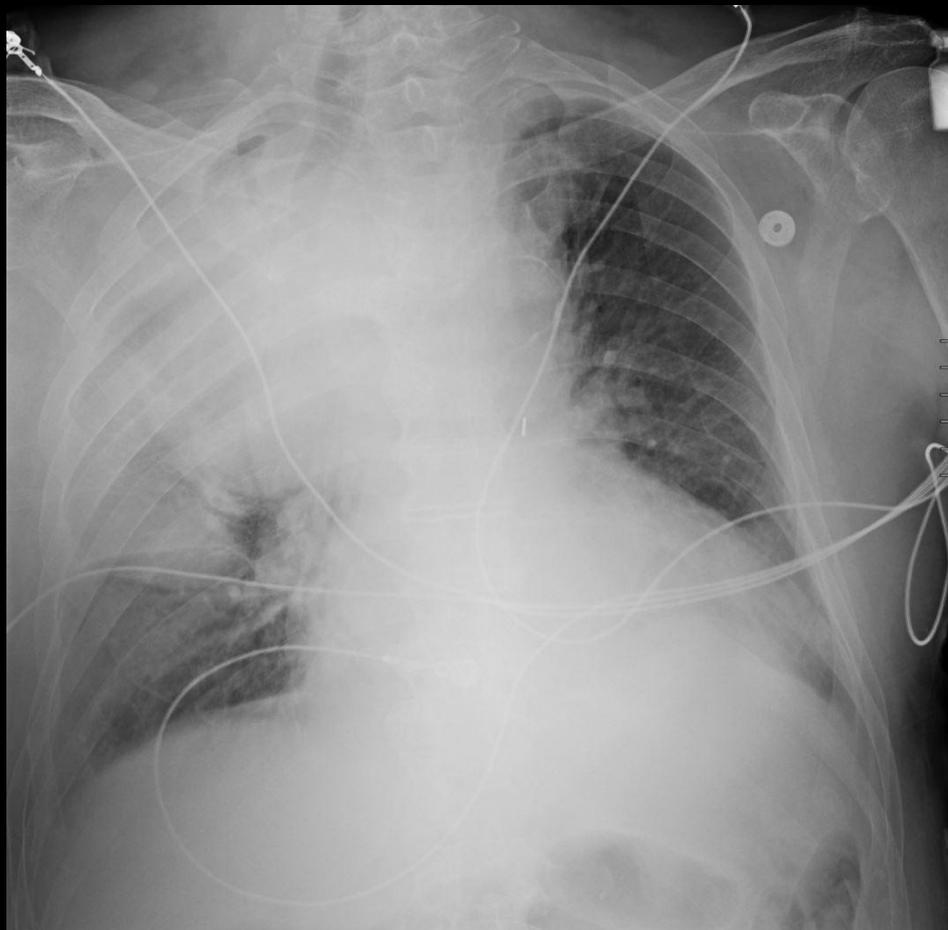
Radiologic Procedure	Rating	Comments	RRL*
X-ray chest	9		☼
US echocardiography transthoracic resting	9		○
US echocardiography transthoracic stress	9		○
Tc-99m SPECT MPI rest and stress	9		☼☼☼☼
Rb-82 PET heart stress	8		☼☼☼
MRI heart function and morphology without and with IV contrast	8		○
MRI heart with function and vasodilator stress perfusion without and with IV contrast	8		○
CTA coronary arteries with IV contrast	8		☼☼☼
Arteriography coronary with ventriculography	8		☼☼☼
MRI heart with function and inotropic stress without and with IV contrast	7		○
US echocardiography transesophageal	5		○
MRI heart function and morphology without IV contrast	5	This procedure may be appropriate but there was disagreement among panel members on the appropriateness rating as defined by the panel's median rating.	○
MRI heart with function and inotropic stress without IV contrast	5	This procedure may be appropriate but there was disagreement among panel members on the appropriateness rating as defined by the panel's median rating.	○
CT heart function and morphology with IV contrast	5	This procedure may be appropriate but there was disagreement among panel members on the appropriateness rating as defined by the panel's median rating.	☼☼☼☼
CT coronary calcium	5		☼☼☼

Rating Scale: 1,2,3 Usually not appropriate; 4,5,6 May be appropriate; 7,8,9 Usually appropriate

*Relative Radiation Level

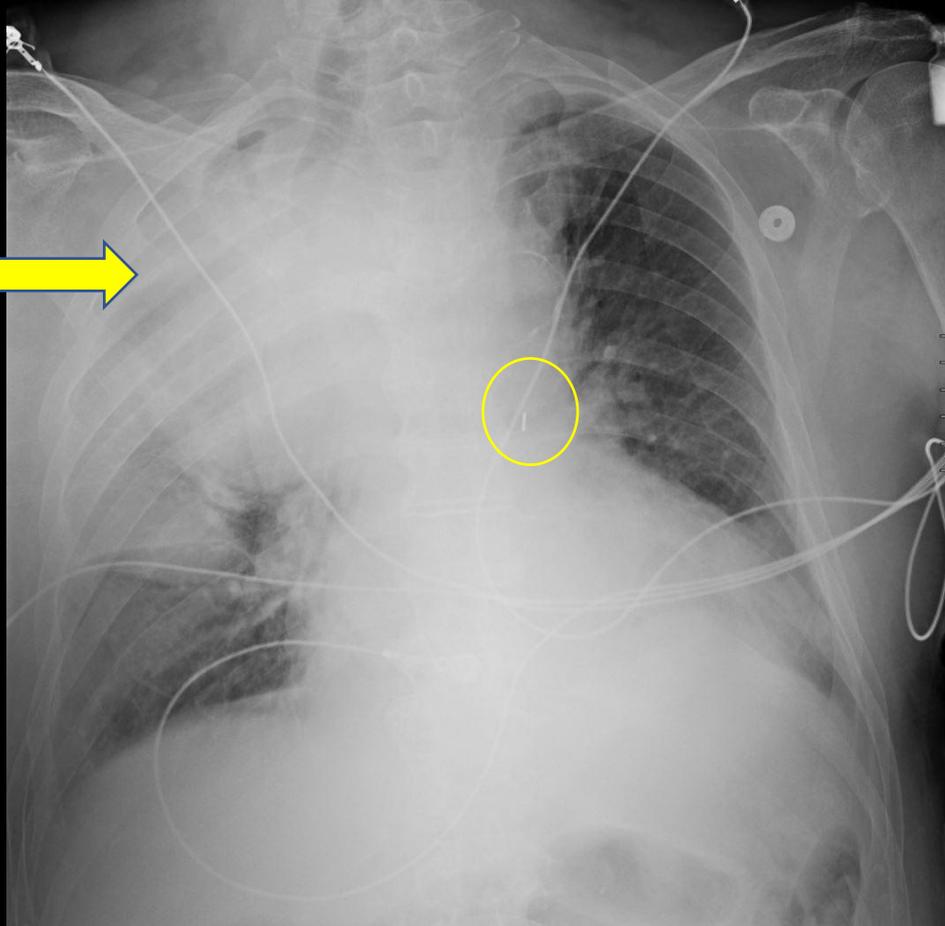
This imaging modality was ordered by the admitting physician

Findings (unlabeled)



Findings: (labeled)

Large opacification of right upper lobe/paratracheal region . Trachea is deviated to the right.



Note the IABP lead (yellow circle).

ACR–SCBT–MR–SPR–STR PRACTICE PARAMETER FOR THE PERFORMANCE OF THORACIC COMPUTED TOMOGRAPHY (CT)

II. INDICATIONS AND CONTRAINDICATIONS

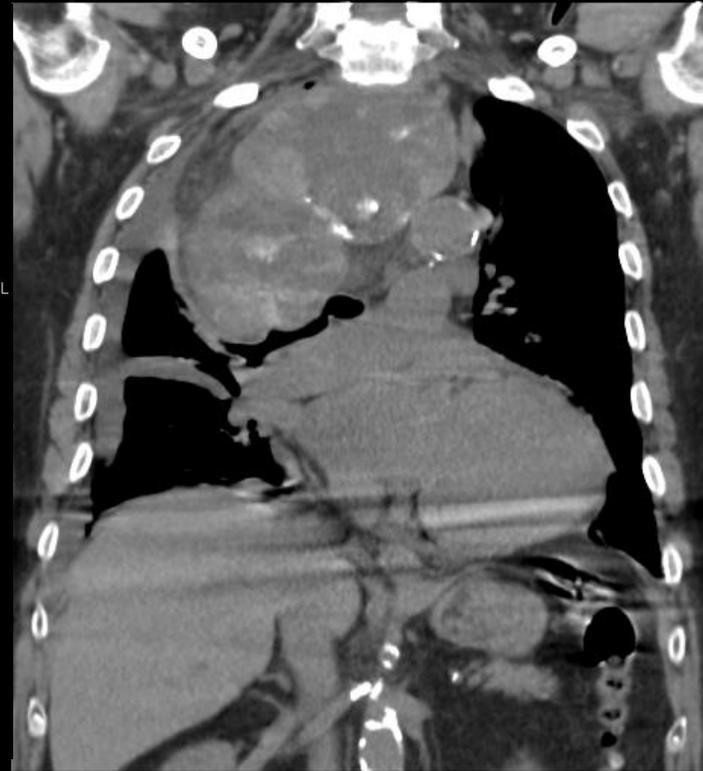
A. Thoracic CT may be a complementary examination to other imaging studies such as chest radiography (see the [ACR–SPR Practice Parameter for the Performance of Chest Radiography](#)) or a stand-alone procedure. Indications for the use of thoracic CT include, but are not limited to [1]:

1. Evaluation of abnormalities discovered on other imaging modalities, including chest radiography [2]
2. Screening for lung cancer [3]
3. Staging and follow-up of lung cancer and other primary thoracic malignancies, and detection and evaluation of metastatic disease [4-7]
4. Evaluation of cardiothoracic manifestations of known extrathoracic diseases [8-11]
5. Evaluation of known or suspected thoracic cardiovascular abnormalities (congenital or acquired), including aortic stenosis, aortic aneurysms, and dissection [12-14]
6. Evaluation of suspected acute or chronic pulmonary emboli [15-24]
7. Evaluation of suspected pulmonary arterial hypertension [25]
8. Evaluation and follow-up of pulmonary parenchymal and airway disease [28-35]
9. Evaluation of blunt and penetrating trauma [36,37]
10. Performance of CT-guided interventional procedures [40-43]
11. Evaluation of the chest wall [44-46]
12. Evaluation of pleural disease [47,48]
13. Evaluation of the mediastinum
14. Treatment planning for surgical or radiation therapy [49,50]
15. Evaluation of medical complications in the intensive care unit or other settings [51,52]
16. Evaluation of postoperative patients and surgical complications [38,39,53]
17. Identification and location of devices within the lungs and cardiovascular system

CT w/o contrast obtained to further evaluate findings on plain film.

**no contrast used due to patient's age.

Findings (unlabeled)



Findings: (labeled)

Mass effect on trachea (*) and esophagus (^)



Large mass in the mediastinum measuring 7.7 x 14.4 cm. Note the calcifications and continuity with the left lobe of the thyroid (L)

Final Dx

Mediastinal goiter with extension from
the left lobe of the thyroid gland

Case Discussion

- Mediastinal Mass
 - Various pathologies can arise from structures normally found in mediastinum which can be divided into anterior, middle, and posterior compartments

Most common anterior mediastinal masses (like our case) can be remembered with the

4 T mnemonic

Thyroid goiter

Thymoma

Terrible Lymphoma

Teratoma (look for fat)

Thyroid Goiter

- Initial presentation

- Incidentally identified on imaging studies performed for other reasons
- May also present with symptoms related to the mass
 - Local symptoms due to compression of mediastinal structures (eg. shortness of breath, dysphagia, etc.)

- Imaging modalities

- Plain film radiography: Findings can vary from subtle to the presence of a widened mediastinum or mass effect on the trachea
- CT: can be used to delineate the anatomy, look for connecting structures, and delineate mass effect on other structures such as the airway
- US: Great modality that does not use radiation that can measure the size of the thyroid gland

References:

- American College of Radiology. ACR Appropriateness Criteria for Dyspnea – Suspected Cardiac Origin. Available at <https://acsearch.acr.org/docs/69407/Narrative/>. Accessed December 7, 2018.
- American College of Radiology. ACR Practice Parameter for the Performance of Thoracic Computed Tomography (CT). Available at <https://www.acr.org/-/media/ACR/Files/Practice-Parameters/CT-Thoracic.pdf>. Accessed December 8, 2018.
- Carter, B.W., Okumura, M., Detterbeck, F.C., & Marom, E.M. Approaching the Patient with an Anterior Mediastinal Mass: A guide for Radiologists. *Journal of Thoracic Oncology*. doi:<https://doi.org/10.1097/JTO.0000000000000295>
- Medscape. <https://emedicine.medscape.com/article/427584-overview>
- Medscape. <https://reference.medscape.com/medline/abstract/28938687>
- Uptodate. <https://www.uptodate.com/contents/approach-to-the-adult-patient-with-a-mediastinal-mass#H16466089>
- Uptodate. <https://www.uptodate.com/contents/clinical-presentation-and-evaluation-of-goiter-in-adults>