

# OSU Diagnostic Radiology Introducing CT Esophagram Protocol for the Workup of Esophageal Perforation



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## INTRODUCTION

Fluoroscopic esophagram swallow study has long been a mainstay and gold standard for imaging modality in the workup and diagnosis for suspected esophageal perforation. Diagnosis in a timely manner is crucial, as esophageal perforation is potentially a surgical emergency.

Recent data has shown CT Esophagram to be superior to fluoroscopic esophagram in many ways as the initial workup and diagnosis of perforation. Namely, CT Esophagram provides a higher sensitivity to the detection of smaller perforations, as well as better characterization of potential alternative diagnoses. CT Esophagram only requires the CT tech to perform the required maneuvers, and only the physician radiologist to interpret the exam. This allows the radiologist more time to tend to other urgent radiology studies happening elsewhere in the hospital.

In contrast, fluoroscopic esophagram requires both physician radiologist to perform as well as interpret the exam and requires a staff radiology technician in-person to assist with the exam.

While staffing is not an issue during day shifts, having to tend to a fluoroscopic procedure during night and weekend shifts can be challenging as an additional radiology technician needs to be called in, and other STAT studies cannot be managed or interpreted while radiologist is performing fluoroscopic esophagram.

## OBJECTIVES

Our goal is to create an imaging protocol and order in EPIC electronic medical record system, to assist in the rapid diagnosis and workup of esophageal perforation when the hospital and radiology department is faced with understaffed shifts such as nights and weekends.

## METHODS

- Current and previous clinical scenarios applicable to suspected esophageal perforation were reviewed, such as presentation, associated chest radiograph findings and history.
- Literature regarding the imaging diagnosis of esophageal perforation was reviewed.
- Protocols and imaging studies utilized at other institutions were reviewed.
- CT Imaging protocol and maneuvers were placed into document form based on abilities and resources available to OSU Medical Center.

## FIGURES

### CT Esophagram Protocol

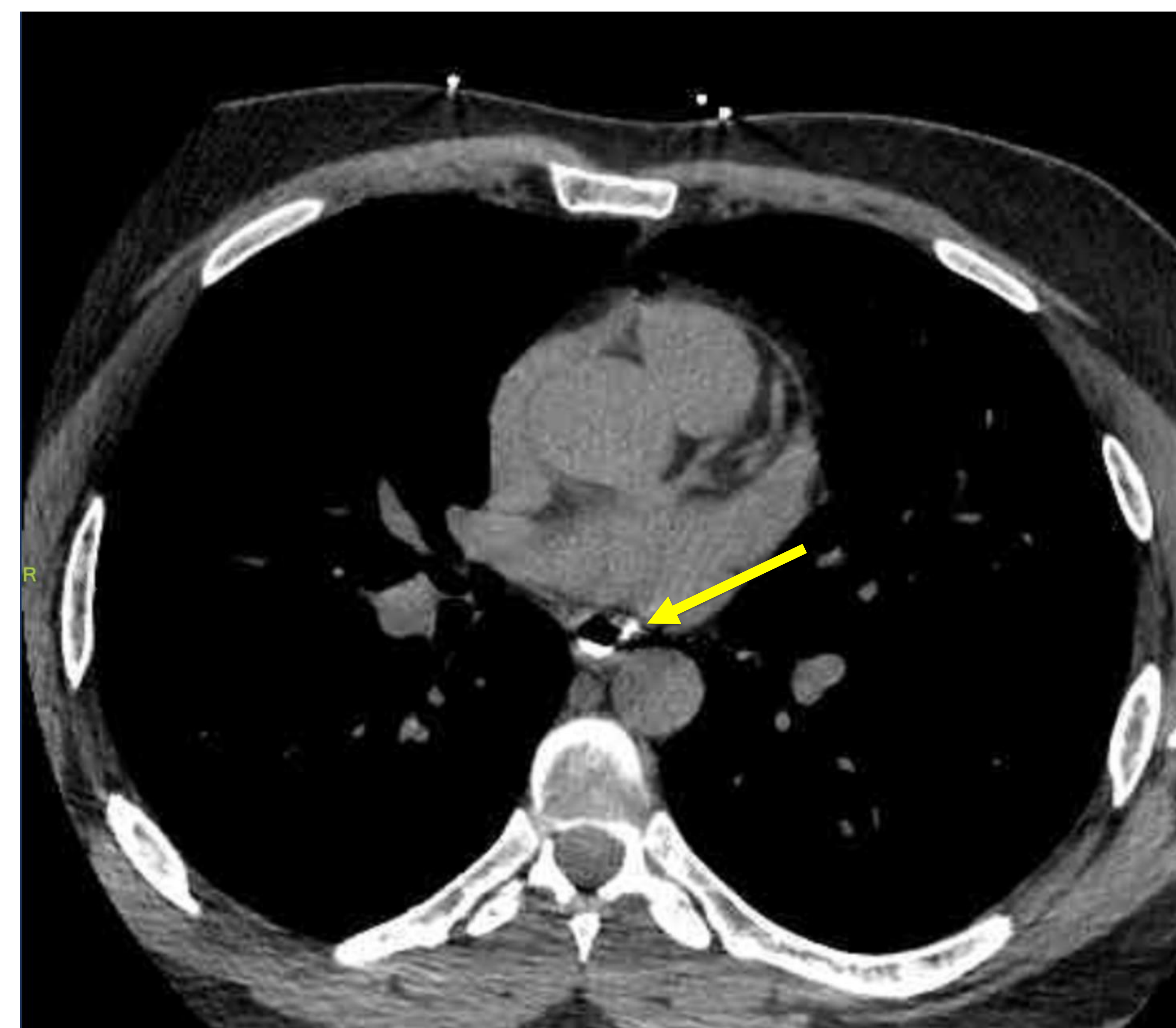
1. Pre-contrast (no IV or oral contrast)
  1. Level of the mandible through the iliac crests
2. Post oral contrast-
  1. Patient **sits up** to drink 4 oz of Omnipaque 350 mixed with thickener if able ("Thick & Easy"; Hormel Health Labs). **They then lay down in same supine position as the pre-contrast scan, turn their head to drink the remaining 4oz** from same cup, through straw.
    1. Initially create two 8oz cups filed with the mixture, one for the initial scan and one for repeat imaging if necessary.
    2. Mixture sits for 5 minutes to thicken.
    3. If patient is unable to drink PO, can maneuver nasogastric (NG) tube so that tip lies proximal to suspected tear or at about the level of the cricopharyngeal sphincter. Can be confirmed by radiologist, Enteric catheter can be maneuvered by ordering physician or radiologist if present.
      1. NG can be localized utilizing scout lateral and frontal images.
  2. Delay 5-seconds, scan supine. 5 second delay allows technologist to hit in room scan button and have time to exit before scanning takes place.
    1. If IV contrast is also administered, it should be administered when the patient returns to supine position after the initial ingestion of 4 oz material while sitting up.
  3. In case of suspected anterior esophageal perforation, can add a prone position with same steps as above.

**Above:** Document form of written CT protocol for CT department designed to efficiently and effectively image esophageal perforation.

**Right:** Axial CT image of the chest after administration of oral Omnipaque 350 showing small focal focal defect of possible contrast extravasation anterior lateral esophageal wall (arrow).

### Future Results

- We expect the implementation of an imaging CT order within the EMR to improve time to diagnosis of suspected esophageal tear.
- Implementing CT Esophagram for weekend and overnight shifts will address staffing issues when fluoroscopy is not available.



## CONCLUSION

Allowing ordering providers to be comfortable ordering CT Esophagram at their own desktop EMR without having to call and coordinate with CT staffing and subsequently the radiologist will streamline appropriate management decisions regarding suspected esophageal perforation.

## REFERENCES

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