UW Health
University of Wisconsin Hospital and Clinics

Division of Nuclear Medicine Procedure / Protocol

ESOPHAGEAL TRANSIT **CPT CODE: 78258**
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Indications: These studies are indicated to identify esophageal motility disorders, such as:

a) amotility of achalasia or scleroderma;
b) hypomotility of presbyesophagus; or
c) hypermotility of diffuse esophageal spasm

Most disorders are readily diagnosed with barium and manometry studies, and esophageal radionuclide studies are reserved for those patients in whom the screening tests were unhelpful.

Patient Prep: Fasting a minimum of 4 hours.

Scheduling: Allow one hour for the test; 15 min for acquisition, the remainder for readying and processing.

Radiopharmaceutical & Dose: Tc-99m sulfur colloid, 1 mCi +/- 20% (0.8-1.2 mCi) placed in a test tube with a small amount of water (10-15 ml), administered orally. Dose is adjusted per weight nomogram/NMIS system.

Imaging Device: Gamma camera with LEHR collimator.

Imaging Procedure:

- The patient lies supine with head turned to one side, with the FOV extending from nose to stomach.
- A straw is used to sip the tube contents, and the patient is instructed to swallow after the acquisition has started.
- Practice swallows without radioactivity are recommended to improve the procedure result.
- The patient then swallows the contents of the test tube using a single swallow.
- The patient then "dry swallows" once, every 15 seconds for the duration of the test (~ 10 minutes, a total of 60 swallows).

The camera acquires in 128 x 128 dynamic mode with 1-second frames for 2 minutes, then 15-second frames for 10 minutes (for a total of 160 frames).

Image Processing: In a more refined study, esophageal ROI's are created at the upper, middle, and lower portions for regional time activity curves, while monitoring the mouth and stomach for delayed swallowing and gastroesophageal reflux. In this case a single swallow might be used, with subsequent "dry swallows" begun after 30 seconds for a combined esophageal evaluation.

On Xeleris, use the "Esophageal Motility Analysis" protocol. Follow on-screen instructions for ROI placement. Generate curves by selecting the Esophageal Transit Processing checkbox.

Display:

- Screen capture the curves that are displayed.
- Next, display the curves for the entire study by moving the white vertical line on the condensed image all the way to the right.
- Screen capture these curves.
- Next, manually display and reframe the raw data to create screens showing 2-second images for the regional study and 30-second images for the total study.

Interpretation: Esophageal emptying: Usually 90% of the tracer clears from the esophagus with the second swallow, and 96% has cleared by 10 minutes. Tolin has reported 100% sensitivity for detecting manometrically proven achalasia, esophageal spasm, and scleroderma. The regional analysis should show a smooth progression in the bolus through the proximal then middle and distal esophagus - it is possible to differentiate achalasia from scleroderma by studying the distal esophagus, while esophageal spasm will show poor bolus passage through the entire length of the esophagus.

PACS: All images, including raw dynamic images and screen caps, should be sent to the PACS system.

Comments: A Nuclear Medicine staff or resident physician should be consulted to determine if additional views are indicated.

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