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Gastroesophageal reflux: An unexpected cause of chest pain identified by review of planar images and coregistered SPECT-CT images

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CASE HISTORY

A 69-year-old man presented to his cardiologist with chest pain and claudication. His history included type 2 diabetes, hypertension, hyperlipidemia, CVA, and esophageal cancer. The patient's esophageal cancer was treated with chemotherapy, radiation, and a transhiatal esophagectomy and cervical esophagogastric anastomosis (creation of a gastric tube with anastomosis to the residual esophagus). The patient described his chest pain as a mild tightness that occurs while lying in bed and lasting for approximately five minutes. He also noted calf tightness with brisk walking or climbing two flights of stairs. Medications included aspirin, beta-blocker and statin.

Given his symptoms and risk factors, gated vasodilator MPI using stress Tc-99m sestamibi and rest Tc-99m tetrofosmin SPECT was performed to evaluate for ischemia. The study revealed normal LV systolic function and a moderate sized, mild to moderate severity, apical and anteroseptal fixed perfusion defect without an associated regional wall motion abnormality which was consistent with attenuation artifact.

However, in review of the planar images, significant radiotracer uptake was noted in a linear fashion posterior to the heart (Figure 1, Video 1). On review of coregistered SPECT-CT images, this area of radiotracer

uptake corresponded with the gastric tube, gastroesophageal anastomosis and residual esophagus and was consistent with gastroesophageal reflux. Furthermore, SPECT-CT images demonstrated the intrathoracic stomach with Tc-99m sestamibi and tetrofosmin activity and post-surgical changes from prior esophagectomy (Figures 2 and 3).

Patients who undergo esophagectomy are at increased risk for development of gastroesophageal reflux symptoms and reflux esophagitis.^{1,2} Given the patient's perfusion imaging did not demonstrate evidence of myocardial ischemia, it is possible that the patient's nighttime chest pain syndrome was related to untreated gastroesophageal reflux.

TEACHING POINTS

- It is important to always review planar images and coregistered SPECT-CT images to evaluate for incidental noncardiac findings, including a thorough assessment of the lungs, breast, mediastinum and GI system.^{3,4}
- Patients who undergo esophagectomy with gastric tube reconstruction are at an increased risk for development of gastroesophageal reflux symptoms and reflux esophagitis.^{1,2}
- Accumulation of radiotracer posterior to the heart in a linear fashion should raise suspicion for gastroesophageal reflux. In a SPECT study that is negative for ischemia, a patient's chest pain syndrome may be explained by this finding. Communication of the finding of gastroesophageal reflux to the referring physician would potentially aid in successfully treating the patient's chest pain syndrome.

Electronic supplementary material The online version of this article (<https://doi.org/10.1007/s12350-019-01627-w>) contains supplementary material, which is available to authorized users.

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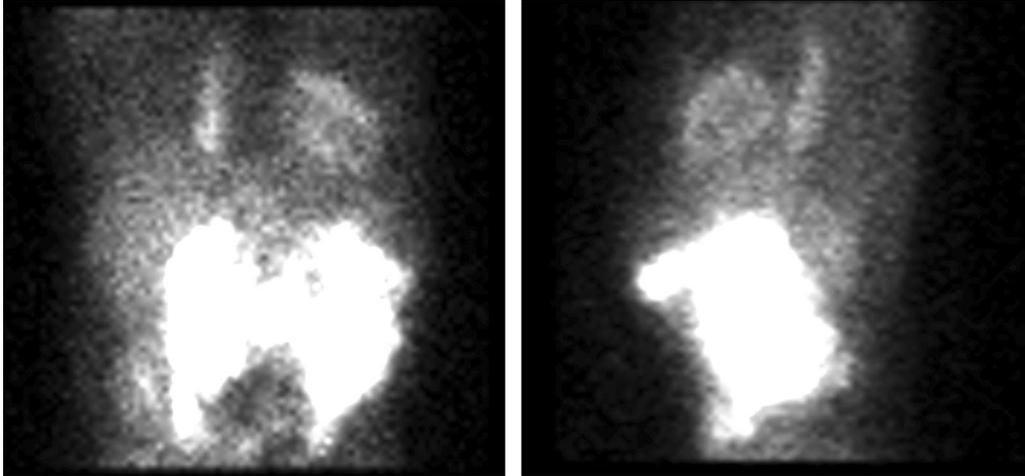


Figure 1. Image as presented in original survey question. Rotating planar images in right anterior oblique and left lateral positions demonstrate linear radiotracer uptake posterior to the heart.

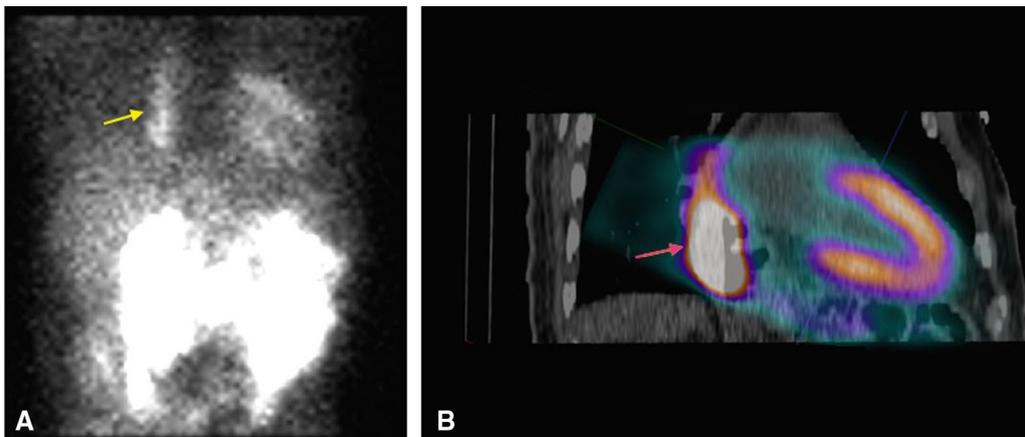


Figure 2. Planar (A) and coregistered SPECT-CT (B) images. The radiotracer uptake in the raw image (yellow arrow) corresponds with Tc-99m sestamibi and tetrofosmin activity in the location of the patient's gastric tube, gastroesophageal anastomosis and residual esophagus (red arrow).

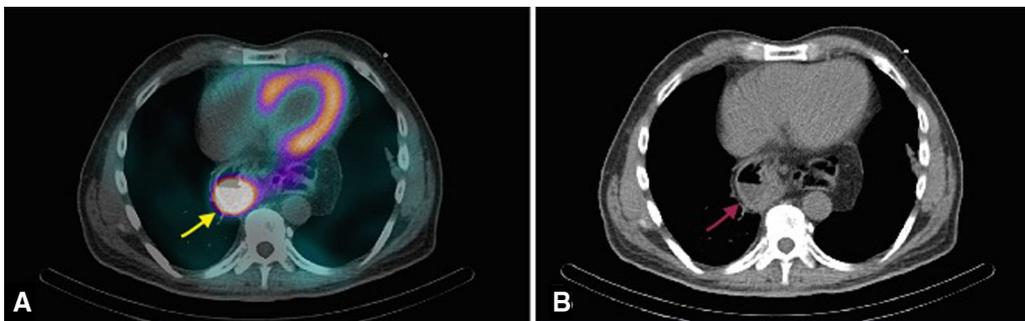


Figure 3. Coregistered SPECT-CT image (A) demonstrating Tc-99m sestamibi and tetrofosmin activity (yellow arrow) posterior to the heart, correlating with the position of the patient's intrathoracic gastric tube (B, red arrow).

FEATURE RESULTS

There were 45 responses of which 8 (18%) were correct. The correct answer is “abnormal radiotracer activity in the esophageal area in the posterior mediastinum on SPECT myocardial perfusion imaging with Tc-99m perfusion tracer due to gastroesophageal reflux”.

By draw, the winner was:

Haim Golan, MD; Assaf Harofeh Medical Center,
Israel

References

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