Case 14124

Eurorad

A Rare Case of 18F-FDG-avid Granular Cell Tumor of the Esophagus

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Section: Chest imaging
Area of Interest: Oesophagus Thorax Gastrointestinal tract
Procedure: Biopsy
Procedure: Molecular imaging
Procedure: Surgery
Imaging Technique: Percutaneous
Imaging Technique: PET
Imaging Technique: PET-CT
Special Focus: Neoplasia Case Type: Clinical Cases
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Patient: 31 years, female

Clinical History:

A 31-year-old African-American female presented with abdominal pain and dysphagia. CT and EGD performed at an outside facility demonstrated an oesophageal mass. Immunohistochemistry showed positive S-100 reactivity. Outside CT, EGD, and immunohistochemistry are not available. PET demonstrated hypermetabolic oesophageal mass and excluded metastatic disease. The patient underwent curative excision.

Imaging Findings:

18F-FDG PET/CT maximum intensity projection (Fig. 1) and multi-planar fused PET/CT and low-dose CT images (Fig. 2) showed an intensely avid mass in the mid-thoracic oesophagus producing mass effect on the left atrium and aorta. The mass had an estimated size of 2 x 2 x 4.5 cm and a maximum standardized uptake value (SUVmax) of 3.9, which was substantially higher than the reference activities of blood pool (SUVmax 1.6) and liver (SUVmax 2.2). There is no evidence of multifocal or metastatic disease.

Histology of H&E stained sections (Fig. 3) revealed monotonous infiltrate of large cells with abundant eosinophilic granular cytoplasm and bland nuclei without significant pleomorphism or mitotic activity. A previously obtained biopsy of the mass at an outside institution revealed diffuse positivity of S-100 via immunohistochemical analysis, confirming neuroendocrine cell origin (no longer available). Gross anatomic image (Fig. 4) demonstrates surgical excision of esophageal mass via right thoracotomy.

Discussion:

Background: Granular cell tumours (GCTs) are rare, usually benign, primarily neuroectodermal neoplasms which can affect all parts of the body, but are most commonly found in the mucus membranes of the aerodigestive tract, soft tissue, and skin [1-3]. Both benign and malignant GCTs are reported to be avid on 18F-FDG PET/CT, which may be useful in the evaluation of GCTs.

Clinical Perspective: Differentiating benign and malignant GCTs on pathology can be challenging, with lesions being

classified as benign, atypical, and malignant [4]. However, given the FDG-avidity of GCTs, it is reasonable to consider utilizing PET/CT for staging and treatment monitoring of GCTs.

Imaging perspective: Due to their rarity, the optimal imaging approach for GCTs has not been established, and no characteristic features have been readily described on MRI [5]. Irrespective of location, GCTs appear as soft tissue masses on CT and do enhance with contrast administration both on CT and MRI. Previously reported GCT SUV max values range from blood pool level (SUV 1.8) to intense activity (SUV 15.8) [6]. Benign GCTs have reported SUV max values of 1.8 to 9.1 and malignant GCTs have reported SUV max values of 5.8 to 15.8 [7-8].

Outcome: The mass was producing left atrial mass effect and was ultimately excised by cardiothoracic surgery. The surgery consisted of right thoracotomy, excision of esophageal mass, esophageal repair with closure, and placement of nasoduodenal feeding tube.

Take home message, teaching points: Cases of both benign and malignant GCTs demonstrating 18F-FDG avidity have been reported in the soft tissue, breast, colon, and lung [9]. To the best of our knowledge, this is the first case of FDG-avid benign esophageal GCT in the literature (SUV 3.9). At this time, there is not enough data to suggest if 18F-FDG avidity is useful in differentiating benign and malignant GCT. In another histologically-related entity, neurofibromatosis-1 (NF-1), 18F-FDG avidity proved to be useful in differentiating benign neurofibromas from transformed malignant peripheral nerve sheath tumors [10]. Because GCTs are FDG avid, it is reasonable to consider utilizing PET/CT for staging to detect multifocal or metastatic disease and for treatment monitoring of GCTs, particularly those with atypical or malignant histology.
Differential Diagnosis List: Benign esophageal granular cell tumor, Neoplasm, Malignant granular cell tumour

Final Diagnosis: Benign esophageal granular cell tumor

References:

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Figure 1

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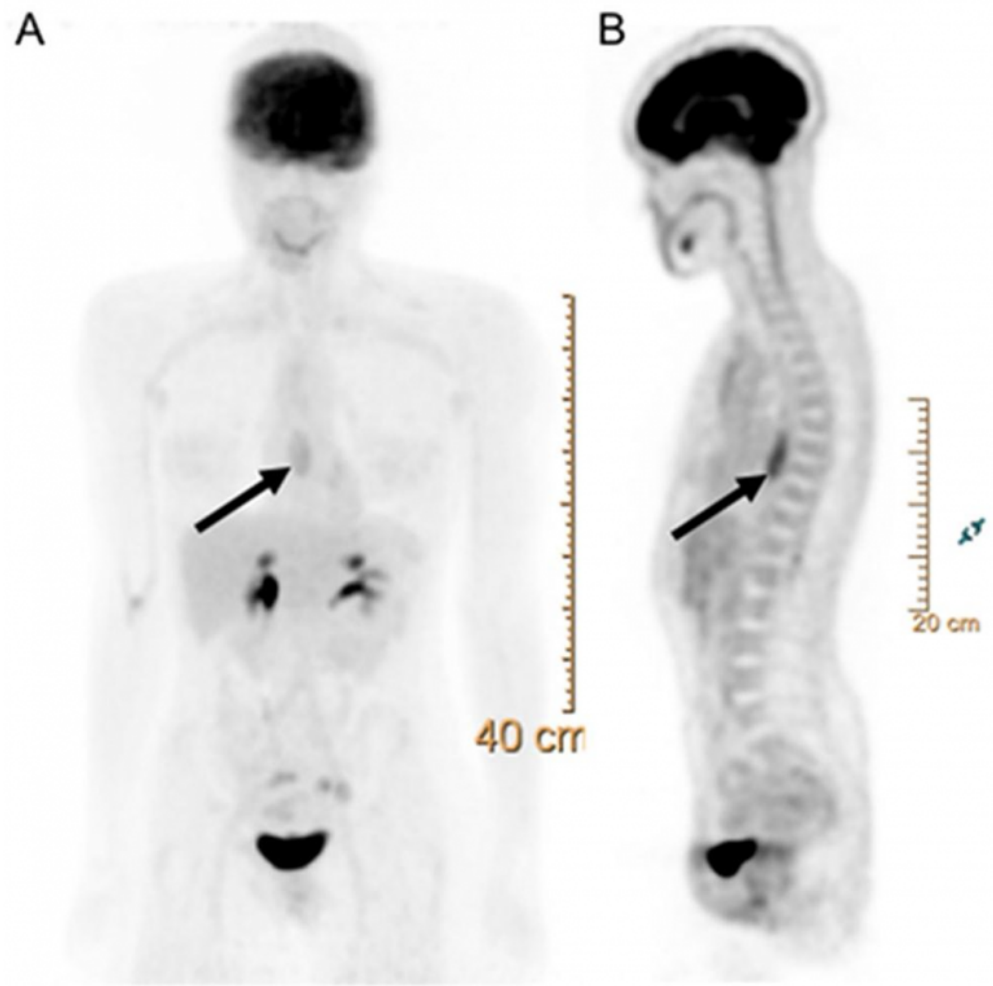
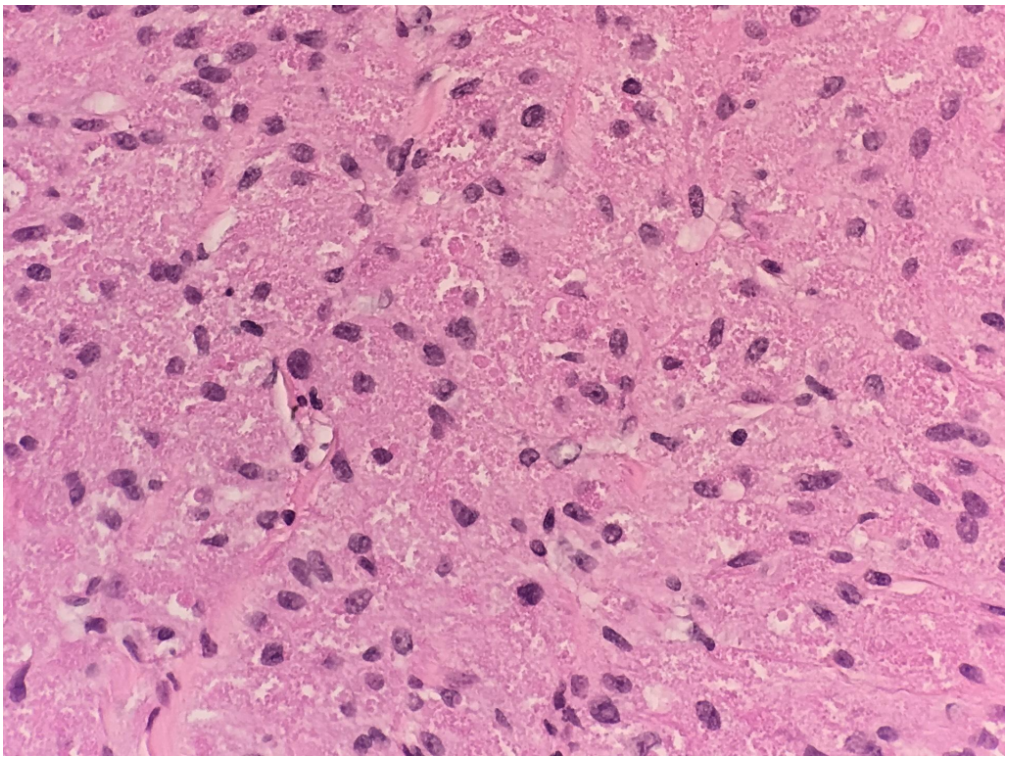


Description: An intensely avid mass (arrow) measuring 2x2x4.5 cm in the mid-thoracic oesophagus producing mass effect on the left atrium and aorta. **Origin:** Pucar D, Department of Radiology & Imaging, Nuclear Medicine Section, Medical College of Georgia, Augusta University, USA

Figure 2

a



Description: Monotonous infiltrate of large cells with abundant eosinophilic granular cytoplasm and bland nuclei without significant pleomorphism or mitotic activity. **Origin:** Savage N, Department of Pathology, Medical College of Georgia, Augusta University, USA

Figure 3

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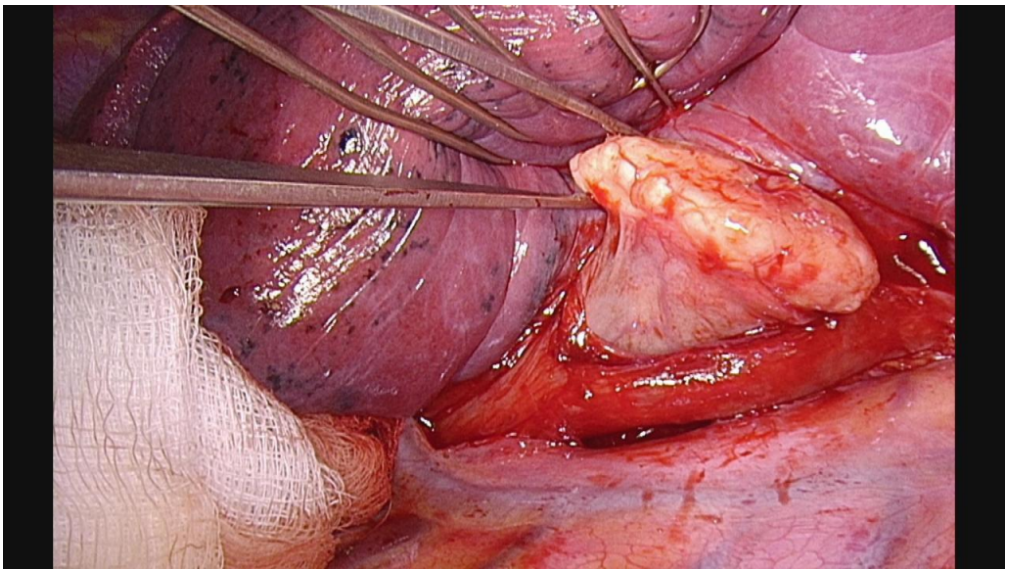

Description: 2x2x4.5cm mass excised from oesophagus by right thoracotomy. **Origin:** Patel V, Department of Surgery, Cardiothoracic Section, Medical College of Georgia, Augusta University, USA

Figure 4

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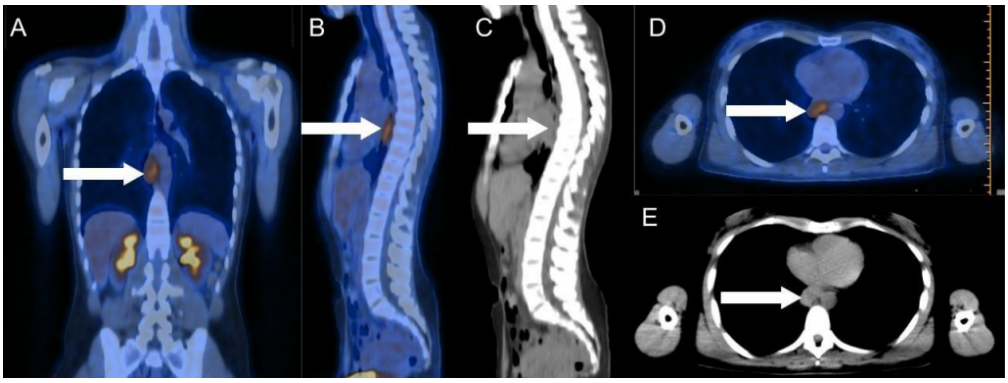

Description: Figure 2A: Coronal fused PET/CT image
Figure 2B: Sagittal fused PET/CT image
Figure 2C: Sagittal LDCT image
Figure 2D: Transverse fused PET/CT image
Figure 2E: Transverse LDCT image **Origin:** Pucar D, Department of Radiology & Imaging, Nuclear Medicine Section, Medical College of Georgia, Augusta University, USA