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Case report

99m-Technetium Sestamibi Uptake in a Gastric Schwannoma

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Abstract

We report the case of a 74-year-old woman with primary hyperparathyroidism who underwent 99m-technetium-sestamibi single photon emission computed tomography-computed tomography for preoperative localization of parathyroid adenoma. Unexpected focal sestamibi uptake was observed at a 5 cm submucosal tumor arising from the greater curve of the stomach. The patient underwent partial gastrectomy and the histological and immunohistochemical findings were consistent with the diagnosis of gastric schwannoma.

Keywords: Gastric schwannoma, parathyroid, sestamibi, single photon emission computed tomography-computed tomography

Introduction

Schwannomas are tumors that originate from Schwann cells of the nerve sheath.[1] They rarely occur in the gastrointestinal tract with the most common site being the stomach. We present the rare case of a 74-year-old woman with gastric schwannoma presenting as an incidental finding on 99m-Technetium (99mTc)-sestamibi single photon emission computed tomography-computed tomography (SPECT/CT).

Case Report

A 74-year-old woman was referred by her family doctor to the endocrinology clinic with hypercalemia and elevated parathyroid hormone level. She complained of persistent fatigue and was under investigation for osteoporosis which had been unresponsive to treatment. She had no other significant co-morbidities and her physical examination was unremarkable.

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Dual phase 99mTc-sestamibi parathyroid scintigraphy was performed for preoperative localization of parathyroid adenoma and showed focal radiotracer uptake at the lower pole of the left thyroid lobe on early and delayed phase imaging. SPECT/CT imaging confirmed the presence of a 6mm nodule that was inferior and posterior to the lower pole of the left thyroid lobe in keeping with a parathyroid adenoma [Figure 1].

Mild focal 99mTc-sestamibi uptake was unexpectedly observed in the upper abdomen. On the SPECT/CT images, the area of abnormal uptake corresponded to an incidental 5 cm smooth, exophytic mass centered on the greater curve of the body of the stomach that contained an ulcer on its mucosal side [Figure 2].

The patient was reviewed by the upper gastrointestinal surgical team and underwent esophagoduodenoscopy and endoscopic ultrasound. Repeated biopsies of the mass were indeterminate. 18-fluorine fluorodeoxyglucose (18F-FDG) positron emission tomography-CT scan showed a significant 18-FDG

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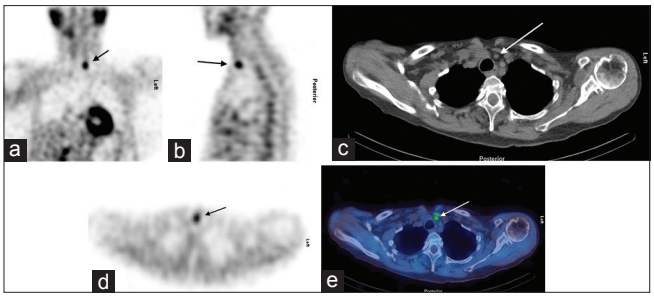

Figure 1: Coronal (a) and sagittal (b) delayed images of dual-phase 99m-technetium-sestamibi parathyroid scintigraphy showing persistent focal tracer uptake at the lower pole of the left thyroid lobe (arrows). Axial computed tomography (c), single photon emission computed tomography (d) and fused single photon emission computed tomography-computed tomography (e) images showing 6 mm nodule with high radiotracer uptake inferior and posterior to the lower pole of the left thyroid lobe (arrows), consistent with parathyroid adenoma

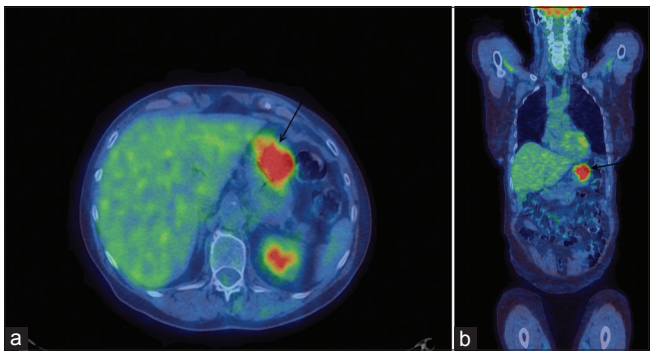

Figure 3: Axial (a) and coronal (b) 18F- FDG PET/CT scan showing significant 18-FDG uptake within the gastric mass

uptake within the gastric mass and no abnormal tracer uptake elsewhere [Figure 3].

The patient underwent partial gastrectomy and the histological and immunohistochemical findings were consistent with the diagnosis of gastric schwannoma.

Discussion

99mTc-sestamibi is currently the radiotracer of choice for scintigraphic imaging of abnormal parathyroid glands. Hybrid SPECT/CT imaging allows acquisition of anatomical and functional information in a single imaging session with improved image quality and sensitivity compared to conventional planar scintigraphy.[2] Sestamibi is a lipophilic cation that is distributed according to blood flow and concentrates intracellularly in the mitochondria, mainly within normal cardiac and thyroid cells.[3] It accumulates within the mitochondria-rich oxyphil cells in parathyroid adenomas and hyperplastic parathyroid glands but is also taken up by a variety of benign and malignant neoplasms.[4] False positive sestamibi uptake has been

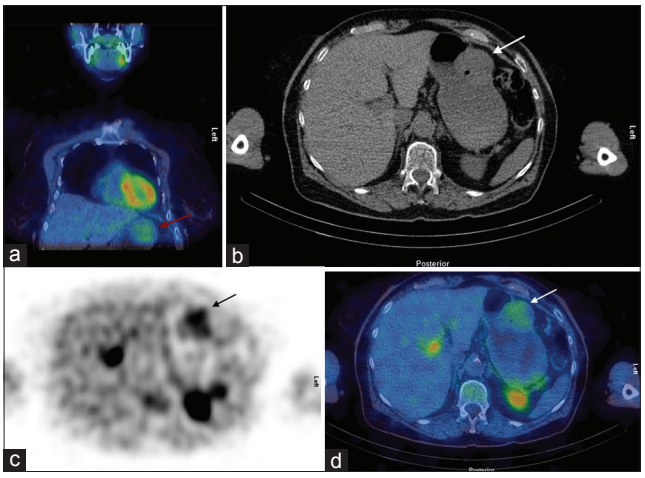

Figure 2: Coronal fused single photon emission computed tomography-computed tomography (a) and axial computed tomography (b), single photon emission computed tomography (c) and fused single photon emission computed tomography-computed tomography (d) images showing mild tracer uptake in the upper abdomen within a rounded, smoothly marginated mass arising from the greater curve of the gastric body (arrow)

reported in thyroid, breast, lung and head and neck carcinomas and their lymph node and bony metastases, as well as bronchial carcinoids.[5-8]

Gastric schwannoma are generally benign, slow growing mesenchymal tumors that arise from the nerve plexus of the gut wall. They tend to occur in older adults (average age 58 years) and are more common in females.[9] Most gastric schwannomas are asymptomatic tumors that are discovered incidentally, but in some cases, they can cause gastrointestinal bleeding, epigastric pain and palpable epigastric mass.[10] The majority of tumors are reported to occur in the middle-third of the stomach along the lesser curvature and the typical endoscopic appearance is of a round, exophytic, submucosal mass with or without central ulceration.[11] Preoperative diagnosis by endoscopy is challenging as its often difficult to differentiate gastric schwannoma from other submucosal tumors such as gastrointestinal stromal tumor. The mechanism of sestamibi uptake in mesenchymal tumors is unclear and to the best of our knowledge, there are no published case reports to date of sestamibi uptake in gastric schwannoma.

Conclusion

Sestamibi can accumulate in a wide range of benign and malignant tumors including gastric schwannoma. SPECT/CT provides accurate anatomical localization and improves diagnostic confidence.

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Conflicts of interest

There are no conflicts of interest.

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