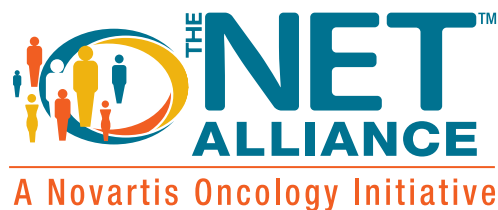


Case Report



Neuroendocrine Tumors (NETs)

Recognizing the Subtleties of This Elusive Cancer



Recognizing and Diagnosing a Neuroendocrine Tumor

3 Months

- Patient has experienced no improvement of hot flashes
 - A different formulation of HRT is prescribed

12 Months

- Patient returns to gastroenterologist with worsening of her IBS symptoms
 - Reports abdominal pain
 - Increased episodes of diarrhea
 - Wakes up at night with diarrhea
 - Evidence of edema in the lower legs
- Patient had discontinued her HRT meds, feeling they were ineffective
- An antidiarrheal and antispasmodics are prescribed for control of IBS-related diarrhea

21 Months

Patient is in need of emergency care



Small Bowel Obstruction

- Presents with acute small bowel obstruction and is taken to the operating room
 - There is marked fibrosis of the terminal ileum, with multiple hairpin turns of the bowel and a small tumor in the terminal ileum

Patient Background

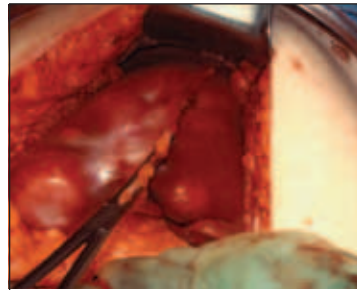
- 54-year-old postmenopausal woman
- Married with 2 adult children
- History of hypertension
- History of mild irritable bowel syndrome (IBS) with diarrhea
 - Family history is negative for both

Case History

- Patient presents to internist for care of hot flashes that have returned 2 years after menopause
 - Occur mostly after meals, when she drinks wine, and when she goes running
- Referred to gynecologist
 - Physical examination is entirely normal
 - Experiences 2 hot flashes without perspiration during the examination
- Hormone replacement therapy (HRT) is prescribed
- Referred to gastroenterologist for IBS treatment



Bowel Resection Surgical Specimen



Liver With Metastatic Tumor

- Tumor is surgically resected
- Surgical investigation reveals multiple metastatic tumors in lobes of the liver

- Biopsies of the liver tumors are taken
- Oncologist consulted

Note: NETs may be referred to using a variety of terms, such as “carcinoids,” “carcinoid tumors,” “endocrine tumors,” or “gastroenteropancreatic NETs (GEP-NETs).” These terms can be used interchangeably with “NETs.”¹¹

Pathology Report

Small bowel and cecal resection reveals

- Neuroendocrine tumor (NET), 1.5 cm, with intense peritoneal sclerosis
- Metastatic tumor in 10 of 23 mesenteric lymph nodes

Liver masses determined to be

- Metastatic NETs

Diagnostic conclusion

- NET associated with carcinoid syndrome
 - Flushing (mistaken for hot flashes)
 - Diarrhea (mistaken for IBS)
 - Peripheral edema

Decipher the Evidence Early

Evidence: Diarrhea was nocturnal

Fact: Nocturnal diarrhea is uncommon in IBS²

Evidence: Hot flashes were not associated with perspiration and did not improve with HRT

Fact: Carcinoid flushing is “dry”³

- Menopausal hot flashes are associated with perspiration⁴

Evidence: Flushing was exacerbated by eating, drinking wine, and running

Fact: Flushing in carcinoid syndrome may be triggered by *The 5 E's*

- Eating^{5,6}
- Emotion^{7,8}
- Exercise^{7,8}
- Epinephrine⁷
- Ethanol^{5,6,8}

Diagnose NETs early

- The estimated time to diagnosis for certain types of NETs is up to 5 to 7 years¹
- 50% of all patients with reported disease stage have either regional or distant metastases at diagnosis, according to Surveillance, Epidemiology, and End Results (SEER) registries (1973-2004)⁹
- SEER data also show that patients with well-differentiated Grade 1 and Grade 2 NETs with distant metastases have a median survival of 33 months⁹

Among the tests that may help in identifying a NET are

- Magnetic resonance imaging¹⁰
- Octreoscan™ imaging¹⁰
- Serum chromogranin A (CgA)¹⁰
- 24-hour urinary 5-hydroxyindoleacetic acid (5-HIAA)¹⁰
- Endoscopic examination, including endoscopic ultrasound¹¹

Octreoscan is a trademark of Covidien AG or one of its affiliates.

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