Interesting Image
Mol Imaging Radionucl Ther 2023;32:156-158 DOI:10.4274/mirt.galenos.2022.06926

Testicular Metastasis of Jejunal Neuroendocrine Tumor on ^{68}Ga-DOTATATE PET/CT

Jejunal Nöroendokrin Tümöre Sekonder Gelişen Bilateral Testiküler Metastazın ^{68}Ga-DOTATATE PET/BT Bulguları

Ömer Faruk Şahin, Özge Erol Fenercioğlu, Ediz Beyhan, Tevfik Fikret Çermik, Nurhan Ergül

University of Health Sciences Turkey, İstanbul Training and Research Hospital, Clinic of Nuclear Medicine, İstanbul, Turkey

Abstract

Neuroendocrine tumors are slow-growing tumors originating from neuroendocrine cells and capable of metastasis. Most of them are found in the gastrointestinal tract; however, they can also be rarely seen in other organs. Testicular neuroendocrine tumors account for less than 1% of all testicular neoplasms. They may present as primary testicular or secondary tumors from extratesticular sources. Jejunal neuroendocrine tumor metastasis to the testis is extremely rare. We present the case of a 61-year-old man with a jejunal neuroendocrine tumor and metastases to bilateral testicles revealed on Gallium-68-DOTATATE positron emission tomography/computed tomography.

Keywords: ^{68}Ga-DOTATATE, testicular metastasis, jejunal neuroendocrine tumor, PET/CT

Öz

İnce bağırsak nöroendokrin tümörleri; intestinal mukozadaki serotonin eksprese eden enterokromoffin hücrelerden köken alan, tüm gastrointestinal tümörlerin %1'inden daha azını oluşturan tümörlerdir. İnce bağırsak nöroendokrin tümörlerinin çoğu iyi diferansiye (G1-G2) tümörler olup en sık mezenterik lenf nodlarına, paraaortik lenf nodlarına ve karaciğere metastaz yaparlar. Jejunal nöroendokrin tümörlerin bilateral testise metastazı nadirdir. Testiküler nöroendokrin tümörler tüm testiküler neoplazmların %1'inden azını oluşturur. Nöroendokrin tümör tanılı 61 yaşında erkek hastaya ait testis metastazı görüntüleri sunulmuştur.

Anahtar kelimeler: ^{68}Ga-DOTATATE, testiküler metastaz, jejunal nöroendokrin tümör, PET/BT

Address for Correspondence: Ömer Faruk Şahin MD, University of Health Sciences Turkey, İstanbul Training and Research Hospital, Clinic of Nuclear Medicine, İstanbul, Turkey
Phone: +90 212 459 60 00 **E-mail:** dromersahin@yahoo.com ORCID ID: orcid.org/0000-0003-3931-4261
Received: 20.06.2022 **Accepted:** 09.10.2022

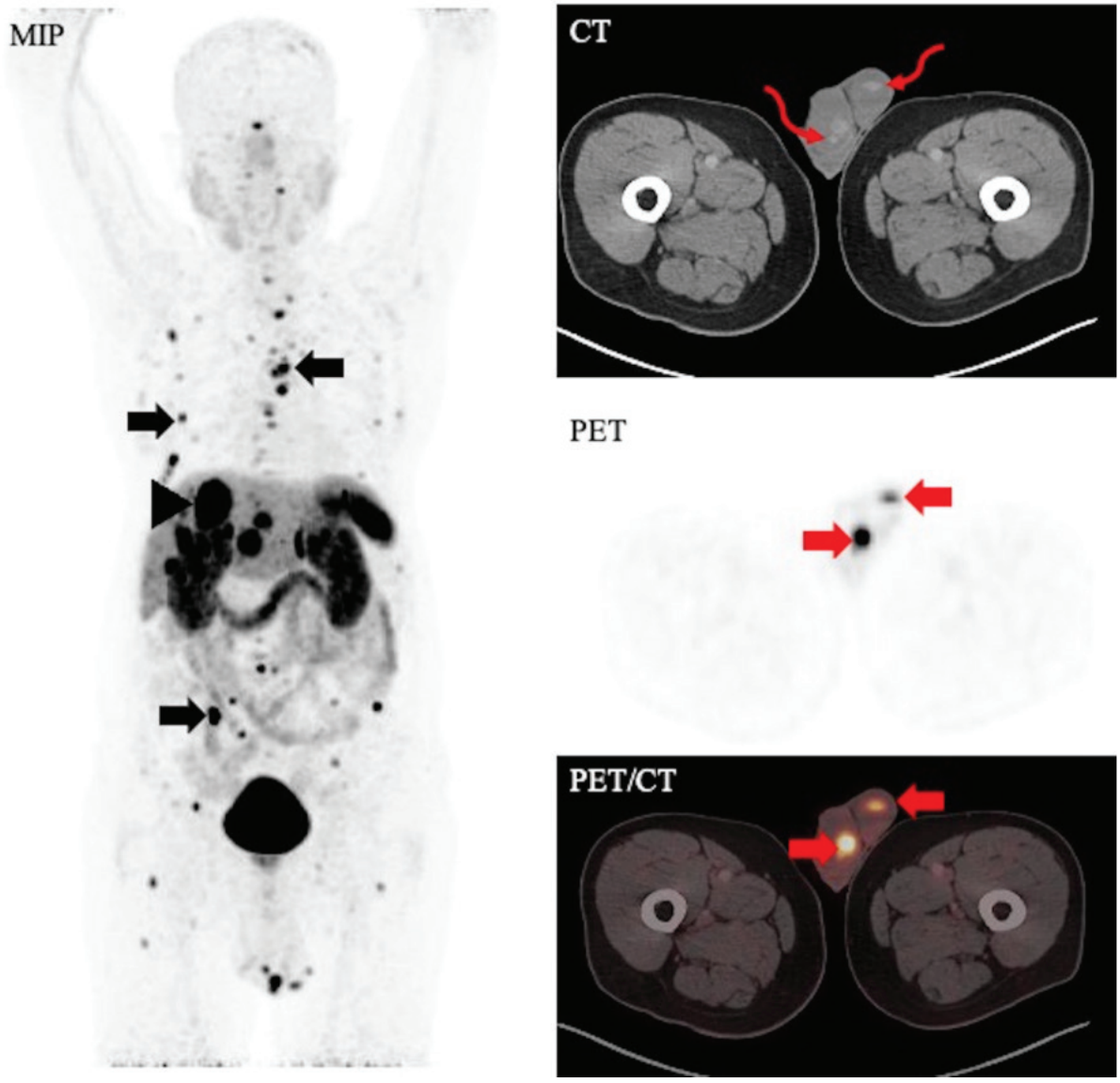

Figure 1. A 61-year-old man with metastatic jejunal neuroendocrine tumor was referred to Gallium-68 (^{68}Ga)-DOTATATE positron emission tomography/computed tomography (PET/CT) for restaging. He had a jejunal operation 18 years ago and was diagnosed with a jejunal neuroendocrine tumor. He had received 10 cycles of 177Lu-DOTATATE therapy and Y-90 microsphere therapy for metastatic lesions in his liver 5 years ago. He has been receiving IM Sandostatin LAR 30 mg monthly. A whole-body ^{68}Ga-DOTATATE PET/CT study maximum intensity projection image revealed multiple metastatic lesions in the whole body: a liver metastasis at segment 4A-8 [maximum standardized uptake value (SUV_{max}): 37.7] (black arrowhead), multiple metastatic foci at the vertebral colon, bilateral hemithorax ribs, and pelvic bones (black arrows). In addition, hyperintense lesions were observed in bilateral testicles on CT (red curved arrows), and these lesions showed intense ^{68}Ga-DOTATATE uptake (SUV_{max}: 28.28) in axial sections of PET and fusion images (red arrows). The testicular ultrasonography study was then applied and both testicular lesions were found to be compatible with metastasis. Approximately 70% of neuroendocrine tumors are located in the gastrointestinal tract, most commonly in the small bowel (45%). Hepatic metastases (45%) are the most common metastatic site of jejunal neuroendocrine tumors, while regional lymph nodes, peritoneum, lungs, bones, pancreas, testicles, ovaries, and myocardium are other rare documented sites of distant metastasis (1,2). ^{68}Ga-DOTATATE PET/CT is used to image primary tumors, metastasis, and recurrence of neuroendocrine tumors because of DOTATATE's high affinity for somatostatin receptors (3). Testicular neuroendocrine tumors account for less than 1% of all testicular neoplasms (4). Primary testicular neuroendocrine tumors usually metastasize to para-aortic lymph nodes, lungs, vertebrae, retroperitoneum, skin, and skeletal muscle (5). Metastatic testicular neuroendocrine tumors generally involve both testes and are associated with multifocality and vascular invasion (6). In the literature, it has been reported that gastrointestinal neuroendocrine tumors cause testicular metastasis in some cases, but none of them used ^{68}Ga-DOTATATE PET/CT for imaging (4,7,8,9,10,11,12,13).

Ethics

Informed Consent: The patient consent was obtained.

Peer-review: Externally and internally peer-reviewed.

Authorship Contributions

Surgical and Medical Practices: Ö.F.Ş., Ö.E.F., E.B., T.F.Ç., N.E., Concept: T.F.Ç., N.E., Design: Ö.F.Ş., Ö.E.F., E.B., N.E., Data Collection or Processing: Ö.F.Ş., Ö.E.F., E.B., Analysis or Interpretation: Ö.F.Ş., Ö.E.F., E.B., N.E., Literature Search: Ö.F.Ş., Writing: Ö.F.Ş.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study has received no financial support.

References

1. Antoniadou F, Korkolis D, Koufopoulos N, Manatakis D, Sakellariou S. A well differentiated neuroendocrine tumor of the jejunum with peritoneal carcinomatosis: a case report. Mol Clin Oncol 2018;9:651-655.
2. Landerholm K, Falkmer S, Järhult J. Epidemiology of small bowel carcinoids in a defined population. World J Surg 2010;34:1500-1505.
3. Bodei L, Ambrosini V, Herrmann K, Modlin I. Current Concepts in ^{68}Ga-DOTATATE imaging of neuroendocrine neoplasms: interpretation, biodistribution, dosimetry, and molecular strategies. J Nucl Med 2017;58:1718-1726.
4. Amine MM, Mohamed B, Mourad H, Majed H, Slim C, Mehdi B, Hela M, Nouri R, Rim K, Tahya B, Nabil MM. Neuroendocrine testicular tumors: a systematic review and meta-analysis. Curr Urol 2017;10:15-25.
5. Wang WP, Guo C, Berney DM, Ulbright TM, Hansel DE, Shen R, Ali T, Epstein JI. Primary carcinoid tumors of the testis: a clinicopathologic study of 29 cases. Am J Surg Pathol 2010;34:519-524.
6. Manna S, Narayana SM, Premalata CS. Primary neuroendocrine tumor of the testis masquerading as germ cell tumor – a case report. Eur J Med Health Science 2020;2:518.
7. Fucs M, Romero FR, Germanos de Castro M, de Carvalho Fernandes R, Camara-Lopes LH, Cardenuto Perez MD. Testicular metastasis 10 years after resection of appendiceal carcinoid. Urology 2005;65:591.
8. Danikas D, Sachs R, Dressner RM, Arvanitis ML. Testicular metastasis from ileal carcinoid: report of a case. Dis Colon Rectum 2001;44:1365-1366.
9. Lau HY, Lai V. Metastatic testicular carcinoid tumour. Hong Kong J Radiol 2013;16:69-73.
10. Berdjis CC, Mostofi FK. Carcinoid tumors of the testis. J Urol 1977;118:777-782.
11. Stroosma OB, Delaere KP. Carcinoid tumours of the testis. BJU Int 2008;101:1101-1105.
12. Cope Z. Metastasis of an argentaffin carcinoma in the testicle. British Journal Urol 1930;2:268-272.
13. Blumberg JM, Sedberry S, Kazmi SO. Bilateral asynchronous metastatic carcinoid tumor of the testis. Urology 2005;65:174.