Sir,

A 45-year-old man with no co-morbid conditions, presented to us with multiple right sided neck nodes and mass abdomen of 6 months duration. He had undergone a total thyroidectomy for medullary carcinoma thyroid (MTC) elsewhere in 2004. Clinical examination revealed a vague nodularity along the thyroidectomy scar and multiple right sided neck nodes along levels II, III and IV, the largest level III node measuring 3 cm × 2 cm. He also has a non-tender, nodular hepatomegaly, which was palpable 6 cm below the right costal margin. The baseline serum levels of calcitonin and carcinoembryonic antigen (CEA) were elevated at 4745 pg/ml and 7050 ng/ml, respectively. His 24 h urinary metanephrine levels were within normal limits (1.3 mg/day). Aspiration cytology from the right level III node, ultrasound guided biopsy from the liver on correlation with the histopathology slides confirmed a diagnosis of metastatic MTC.

A Ga-68 Dotanoc somatostatin analog positron emission tomography-computed tomography (PET-CT) scan and a I-131 metaiodobenzylguanidine (MIBG) scan were done as a part of the metastatic evaluation. Ga-68 accumulation was seen in the following regions; residual thyroid gland, multiple cervical and superior mediastinal lymph nodes, multiple lesions in the liver, largest 8.2 cm × 8 cm in segment VIII and right iliac bone measuring 2.2 cm × 1.7 cm [Figure 1].

The MIBG scan showed metabolically active uptakes in bilateral cervical and superior mediastinal lymph nodes, the liver and the right side of pelvis anatomically corresponding to the uptakes seen in the Ga-68 Dotanoc PET-CT [Figure 2]. The MIBG scan and the Ga-68 Dotanoc PET-CT scan [Figure 3] showed a near total congruence. This is supposedly a very rare phenomenon as the uptakes in the MIBG scan and the traditional somatostatin scintigraphic scans are reported to be mutually independent of one another.[1–3] The patient was not keen on considering
experimental therapies with targeted agents. He is presently asymptomatic and is on follow up for more than 2 years with stable disease after two ablations (100 and 65 mCi) with I-131 MIBG therapy. The levels of serum calcitonin decreased to 1038 and 758 pg/ml after the first and second ablations, respectively.

MTC which accounts for 4% of thyroid carcinomas originates from neuroendocrine parafollicular C cells and is known to secrete calcitonin and CEA. Conventional radiological modalities such as ultrasound, computerized tomography, and magnetic resonance imaging are used for detecting recurrences following total thyroidectomy in MTC. However, metastatic MTC is known to escape detection by the above modalities, despite the presence of persistently elevated serum calcitonin levels.

Numerous radio-pharmaceuticals are currently being used for detecting recurrences and distant metastases from MTC such as I-131 MIBG, technetium (Tc)-99m dimercaptosuccinil acid and Tc-99m methoxyisobutylisonitril, fluorodeoxyglucose (FDG) PET-CT and 3,4-dihydroxy-6-F-18 fluoro-L-phenylalanin (F-18-DOPA PET-CT) with varying sensitivities and specificities. Somatostatin receptors are present in MTCs; however, their distribution is heterogeneous making traditional somatostatin receptor scintigraphy of limited usefulness for detection of metastatic MTC. However, the Ga-68 somatostatin analogue Dotanoc PET-CT has been reported to be useful in the detection of neuroendocrine tumors; its use in detecting recurrent/metastatic MTC patients is promising.[4] Our case also shows Ga-68 Dotanoc PET-CT to be a useful complementary imaging modality in detection of recurrent/metastatic disease in patients with MTC, additionally its congruence with the MIBG scan uptakes needs to be further studied.

Figure 1: (a-b) Ga-68 Dotanoc positron emission tomography-computed tomography (PET-CT) scan image. Ga-68 Dotanoc PET-CT accumulation was seen in the following regions, standardized uptake value (SUV) was calculated as per body weight. (1) Residual thyroid gland (SUV-17), (2) multiple bilateral cervical and superior mediastinal lymph nodes, more on right side, the largest right level III node measuring 3.3 cm × 3.2 cm, (3) multiple lesions in the liver (SUV-10), largest 8.2 cm × 8 cm in segment VIII, and (4) Right pelvis measuring 2.2 cm × 1.7 cm (SUV-16)

Figure 2: (a-b) I-131 metaiodobenzylguanidine (MIBG) scan image 1 mCi (37 MBq) of I-131 MIBG was given intravenously and subsequently a whole body imaging was acquired at 48 h and again at 72 h. The thyroid uptake was blocked by oral administration of stable iodine, one day prior and 8 days following the injection. Physiological uptake was seen in the kidneys and salivary glands. Metabolically active uptakes were noted in the bilateral cervical and superior mediastinal lymph nodes, the liver and the right side of pelvis anatomically corresponding to the uptakes seen in the Ga-68 Dotanoc positron emission tomography-computed tomography

Figure 3: (a-b) Computed tomography scan axial images demonstrating the multiple liver metastatic deposits lesions and in the right pelvis
Letters to Editor

Arvind Krishnamurthy, Vijayalakshmi Ramshankar1, Krishna Kumar1,2
Departments of Surgical Oncology, Preventive Oncology1 and Nuclear Medicine2, Cancer Institute (WIA), Adyar, Chennai, Tamil Nadu, India

Address for correspondence:
Dr. Arvind Krishnamurthy,
Department of Surgical Oncology,
Cancer Institute (WIA), 36, Sardar Patel Road,
Adyar, Chennai - 600 020, Tamil Nadu, India.
E-mail: drarvindkrishnamurthy@yahoo.co.in

REFERENCES

1. Grünwald F, Ezziddin S. 131I-metaiodobenzylguanidine therapy of neuroblastoma and other neuroendocrine tumors. Semin Nucl Med 2010;40:153-63.

2. Gao Z, Biersack HJ, Ezziddin S, Logvinski T, An R. The role of combined imaging in metastatic medullary thyroid carcinoma: 111In-DTPA-octreotide and 131I/123I-MIBG as predictors for radionuclide therapy. J Cancer Res Clin Oncol 2004;130:649-56.

3. Kaltsas GA, Mukherjee JJ, Grossman AB. The value of radiolabelled MIBG and octreotide in the diagnosis and management of neuroendocrine tumours. Ann Oncol 2001;12:S47-50.

4. Nicolini S, Ambrosini V, Fantini L, Fanti S. 68Ga DOTANOC PET/CT detects medullary thyroid cancer relapse at bone level. Clin Nucl Med 2012;37:591-2.