This is a 21 year-old woman with a history of labile blood pressure caused by bilateral carotid body tumors, which were surgically resected. She subsequently presented with recurrent blood pressure lability two years later and tumor recurrence was suspected. Both an MRI and contrast-enhanced CT of the neck showed equivocal findings in the right neck. An 123I-MIBG scan was performed and was normal, but the lesion was thought to be too small for characterization with MIBG. An 18F-FDOPA PET/CT scan was then requested and did not demonstrate any uptake in the right neck. However, there was an intense focus of uptake involving the C4 spinous process compatible with a paraganglioma bone metastasis (Figure 1). The whole body study demonstrated a physiologic distribution of activity without any other site of disease (Figure 2). Based on the 18F-FDOPA results, the patient underwent an “en bloc” resection of the C4 lamina/spinous process. Paraganglioma was confirmed pathologically within the marrow space.

PET/CT and Paraganglioma:
Paragangliomas are a type of neuroendocrine tumor that originate from neural crest stem cells. They are associated with the sympathetic or parasympathetic nervous systems and may arise anywhere along the paraganglial system that runs from the skull base to the pelvic floor. Approximately 70 percent of extra-adrenal paragangliomas occur in the head and neck region, with the most common site being the carotid body. Carotid body tumors are usually slow-growing and painless but can rarely secrete catecholamine. It is estimated that around 10 percent of paragangliomas are malignant although some have reported a higher frequency1. Paragangliomas can decarboxylate amino acids such as dihydroxyphenylalanine (DOPA) have been shown to take up 18F-FDOPA. 18F-FDOPA PET has been found to be more sensitive than MIBG scintigraphy in the staging and restaging of paragangliomas and in some studies detected more lesions than CT/MRI, with reported sensitivities of 81-100 percent2-3. However decreased sensitivity of 18F-FDOPA has been reported in SDHB mutation carriers, in whom 18F-FDG and 18F-FDA (fluorodopamine) performed better4.

3. Fiebrich HB, Brouwers AH, Kerstens MN, et al. 6-[F-18]Fluoro-L-dihydroxyphenylalanine positron emission tomography is superior to conventional imaging with [123I]-metaiodobenzylguanidine scintigraphy, computer tomography, and magnetic resonance imaging in localizing tumors causing catecholamine excess. J Clin Endocrinol Metab 94:3922-2930