

Recurrent Para-aortic Paragangliomas

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Abstract

Episodic spells of headache, palpitations, and flushing may be the result of catecholamine-secreting tumors such as extra-adrenal paraganglia tissue – paragangliomas. Presentation, diagnostic implications, and radiographic imaging of paragangliomas are discussed within the context of a case presentation. Although the operative cure rate is high, the variable course of the disease requires life-long follow-up.

Keywords: Paraganglioma, para-aortic, catecholamines, spells.

CLINICAL SCENARIO

A 66-year-old retired female nursing instructor presented with a 12-year history of spells. These episodes occurred every 2 to 3 months and lasted from 3 to 5 minutes. The spells were characterized by headache, flushing, visual changes, and hypertension without palpitations or tachycardia. Throughout the years she had been frustrated by the lack of explanation despite repeated evaluations. Her past medical history included a remote thyroidectomy for papillary thyroid cancer, diabetes mellitus type 2, and hypertension not controlled with an angiotensin-converting enzyme (ACE) inhibitor.

Dependent on the severity of the spell, the patient's systolic blood pressure ranged from 150 to greater than 200 mmHg with a diastolic pressure ranging from 100 to 120 mmHg during a paroxysm. A 24-hour urine test revealed an elevated total metanephrine of 1789 µg/24 hours and elevated norepinephrine of 249 µg/24 hours. This led to ¹²³I-metaiodobenzylguanidine (MIBG) scintigraphy and magnetic resonance imaging (MRI) studies. The ¹²³I-MIBG scan demonstrated a left para-aortic mass inferior to the lower pole of the left kidney. MRI of the abdomen better delineated a 4.5 × 3.3 cm left para-aortic mass posterior to the left renal vasculature.

In 2004, we performed an open laparotomy with *en bloc* resection of the mass. As suspected, this proved to be a para-aortic paraganglioma. Six months later she was seen with no evidence of recurrence with normalization of her 24-hour urinary excretion of metanephrines and catecholamines. She underwent germline mutation testing for succinate dehydrogenase (SDH) subunits SDHD and SDHB, and RET-protooncogene; no germline mutations were found.

However, 3 years later, while sharing a Thanksgiving Day meal with her family, she experienced a spell similar to the previous episodes. At this time the patient had intentionally lost 25 to 30 pounds and her glycemic control had improved. Her plasma fractionated free metanephrines were normal, as were her 24-hour urine fractionated metanephrines and catecholamines.

Given the dramatic return of symptoms, ¹²³I-MIBG scintigraphy and abdominal MRI were obtained. The ¹²³I-MIBG scan displayed abnormal uptake within the soft tissue adjacent to the aorta (Fig. 1). Two well-vascularized masses were similarly seen on MRI consistent with residual tumor or paraganglioma recurrence (Fig. 2).

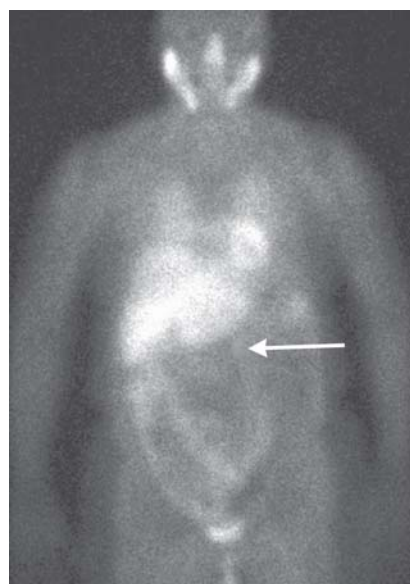


Fig. 1: MIBG scan revealed abnormal uptake within the soft tissue adjacent to the aorta (arrow)

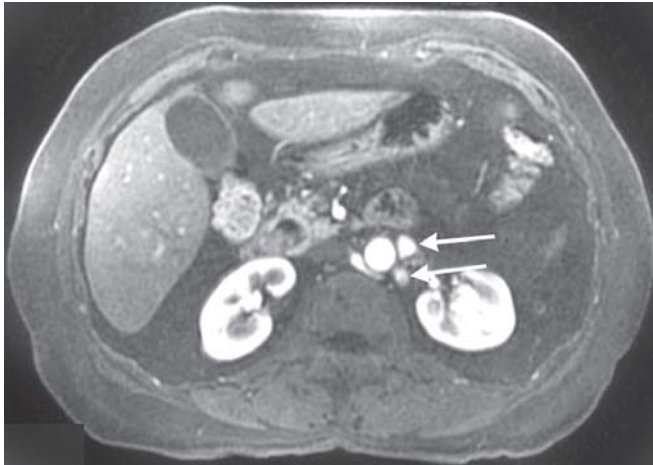


Fig. 2: Two well-vascularized masses seen on MRI are consistent with residual tumor or paraganglioma recurrence (arrows)

The patient was symptomatic, fit, and healthy, and surgical resection was recommended. At repeat laparotomy, the two masses identified on MRI were removed from the left para-aortic area. Both masses were approximately 1.5 cm in diameter and were consistent with recurrent paraganglioma. Furthermore, within the resected block of tissue was a lymph node containing metastatic paraganglioma.

Two nights after surgery the patient experienced a dramatic adrenergic spell of hypertension, palpitations, and hyperthermia similar to her preoperative spell at the Thanksgiving dinner. She was restarted on her ACE-inhibitor with normalization of her blood pressure and she had no further spells. She was dismissed on her fourth postoperative day. Two weeks later plasma fractionated metanephrines and catecholamines were normal. There was no evidence of residual disease; however, she will require close follow-up.

DISCUSSION

Catecholamine-secreting tumors can be found in both the adrenal medulla (pheochromocytoma) and extra-adrenal paraganglia tissue (paraganglioma).¹ There is little biochemical or histological difference between pheochromocytomas and paragangliomas, except that many pheochromocytomas have the ability to produce epinephrine, whereas paragangliomas do not.² The latter are chromaffin-cell tumors that can be found along both the sympathetic and

the parasympathetic chains.³ The majority of these tumors are benign. However, the lack of predictors and the variable course of the disease make predicting malignancy very difficult.² Life-long follow-up is necessary. Urine catecholamines should be measured as they have an 89.9% sensitivity for extra-adrenal paragangliomas. Although MRI is the most sensitive study for paragangliomas, ¹²³I-MIBG study is also highly specific,⁴ and in some patients only ¹²³I-MIBG scan will initially detect the tumor.

In a retrospective review, Erickson et al⁴ found that operative cure was achieved in 69% of patients with paragangliomas (n = 236). Cure was not achieved for patients with recurrent disease, persistent disease, or subsequent metachronous tumors. While curative resection is rare for malignant chromaffin-cell tumors, palliative resection increases the efficacy of other therapies.² These subsequent therapies include radiotherapy and chemotherapy. Treatment with high-dose ¹²³I-MIBG may be useful following resection.² Chemotherapy, however, is only recommended for palliative care.² The 5-year survival rate for malignant catecholamine-secreting paragangliomas is 74%.⁵

This patient tolerated the second resection without difficulty and in our minds likely represents failed removal of all paraganglioma clusters or nodes from the first procedure. Her long-term outlook remains unknown.

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