

IMAGES IN HYPERTENSION

Pheochromocytoma

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ABSTRACT

Pheochromocytomas are rare catecholamine-producing tumors derived from chromaffin cells; 10% of these are malignant, 10% are bilateral, and 10% are extra-adrenal. These are imaged with a variety of modalities including computed tomography, magnetic resonance imaging, scintigraphy, and rarely angiography.

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INTRODUCTION

Pheochromocytomas are rare catecholamine-producing tumors derived from chromaffin cells; 10% of these are malignant, 10% are bilateral, and 10% are extra-adrenal. These are imaged with a variety of modalities including computed tomography (CT), magnetic resonance imaging (MRI), scintigraphy, and rarely angiography. Pheochromocytoma arises from hyperfunctioning adrenal medulla or in the paraganglionic chromaffin tissue of the sympathetic nervous system. They may occur anywhere from the base of brain to the urinary bladder and are considered to be paragangliomas. Extra-adrenal pheochromocytomas occur in the organ of Zuckerkandl, bladder wall, heart, retroperitoneum, mediastinum, and neck in the carotid and glomus jugulare bodies. These tumors may have varied imaging appearances since they undergo degeneration, which affects their imaging features. This changeable appearance is described as "chameleon" epithet.¹

The tumors arise from the chromaffin cells of the adrenal medulla and are associated with increased catecholamine production. Although chromaffin tissue is also present elsewhere in the body, such as in the mediastinum, along the aorta, and in the pelvis, the term pheochromocytoma is reserved for tumors that arise from

the adrenal medulla. Chromaffin cell tumors at other locations are more appropriately called paragangliomas or chemodectomas, although the term extra-adrenal pheochromocytoma is still applied. Examples of pheochromocytomas are shown (Figs 1 and 2).

Patients who may be referred for imaging of the adrenal glands include those with new or worsening diabetes mellitus (owing to impaired glucose regulation) and those with hypertensive crisis after anesthesia, surgery, or treatment with medications.² Imaging may also be performed in patients with a known history of multiple endocrine problems.³ Computed tomography scanning and MRI have higher sensitivity in detecting pheochromocytomas than do nuclear medicine scanning with ¹³¹I-metaiodobenzylguanidine (MIBG), although ¹³¹I-MIBG uptake is more specific. Some authors prefer to use MIBG uptake scanning as the initial screening modality because it enables whole-body imaging, making

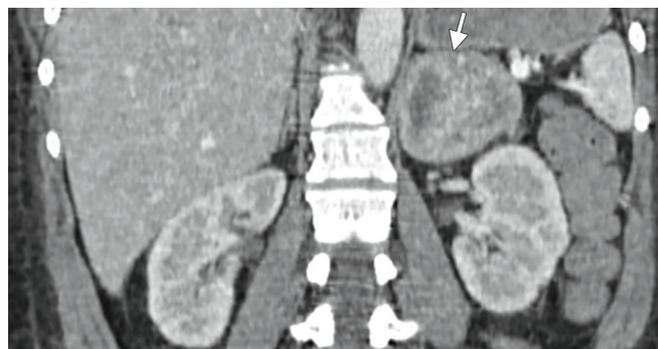


Fig. 1: Computed tomography depicting pheochromocytoma of the left adrenal

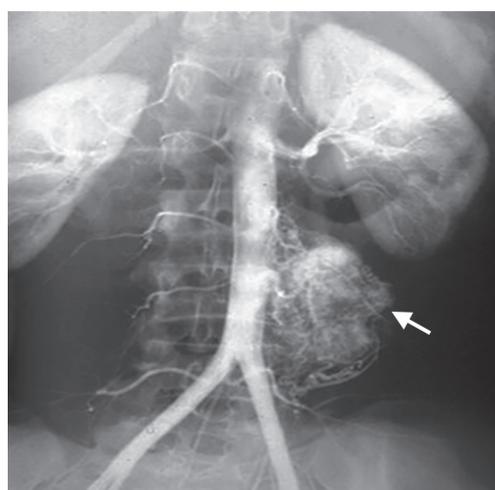


Fig. 2: Aortography visualizing extra-adrenal pheochromocytoma (paraganglioma in the para-aortic area)

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it useful for the detection of extra-adrenal tumors and metastatic deposits.

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