Case Based Urology Learning Program

Resident's Corner: *UROLOGY*

Case Number 4

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A 57-year-old woman is diagnosed with an incidental 3.5 cm L adrenal tumor. She is otherwise healthy and has mild hypertension.

What is the main differential diagnosis?

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Adrenal adenoma is most common, and many can be functional, such as those that secrete adosteronoma or that cause subclinical Cushing's syndrome.

Silent pheochromocytoma is found in about 4-5% of such patients and must be identified prior to surgery to avoid a hypertensive crisis.

Adrenal cortical carcinoma is found in about 2-4% of patients with adrenal incidentaloma, although most cancers are larger than 5-6 cm.

Metastatic cancer, commonly from lung cancer, breast cancer, RCC, melanoma, or GI cancers should be high on the differential for patients with a diagnosis of prior malignancy.

Multiple other diagnosis, such as hemorrhage, myelolipoma, adrenal cyst, etc. should also be considered in the differential diagnosis.

What other information should be obtained in the patient history?

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Symptoms of any of the endocrine manifestations of subclinical Cushing's syndrome (HTN, glucose intolerance, obesity, skin changes, etc), pheochromocytoma (HTN, HA, diaphoresis, tachycardia or palpitations, anxiety) or primary aldosteronism (muscle cramping or nocturia/polyuria related to hypokalemia).

Constitutional symptoms (fatigue, weight loss, etc) or symptoms of metastatic disease (bone pain, etc).

Abdominal pain, lower extremity edema.

Virulization, which usually indicates malignancy.

History of other malignancy.

What laboratory tests should be considered?

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CMP with potassium level to evaluate for hypokalemia.

Plasma metanephrines and/or urine metanephrines to evaluate for pheochromocytoma -- this is the single most important issue, because silent pheochromocytoma represents about 4-5% of all adrenal incidentalomas.

24 hour urine cortisol collection and/or low dose dexamethasone suppression test.

If virulization: testosterone and 17-keto steroids.

What tests should be considered to exclude an extra-adrenal primary cancer?

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Mammography, CXR, and colonoscopy if not up to date with screening recommendations.

What are the typical imaging characteristics of adrenal adenoma, pheochromocytoma, and adrenal cortical carcinoma?

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Adenoma: Unenhanced CT: lesion is <10 HU and homogenous, reflecting high concentration of lipids, because adrenal tissue converts cholesterol into steroid hormones

Enhanced CT: Rapid washout

MRI: chemical shift

Pheochromocytoma: "light bulb" image on T2 sequences, found in about 90% of these tumors

Adrenal carcinoma: Typically large (>5-6 cm), heterogeneous and strongly enhancing, and calcified with associated necrosis. 5-10% invade the venous system in a manner similar to RCC.

When should you operate on an adrenal tumor, presuming the patient is relatively healthy?

When should you operate on an adrenal tumor, presuming the patient is relatively healthy?

Presuming the tumor does not have classic findings of a benign tumor such as myelolipoma or adrenal cyst, surgery is considered when any of the following 4 characteristics are observed:

Large tumor size: > 5-6 cm

Endocrinologically active

Imaging is not consistent with an adenoma (see previous question)

Substantial interval growth

When is biopsy of an adrenal mass helpful?

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Biopsy of adrenal masses is typically not helpful for distinguishing an adrenal adenoma from a carcinoma, because it is very difficult to differentiate these on limited pathologic material. In the end, as for most endocrine tumors, a clear diagnosis of malignancy is only obtained if local invasion or metastasis can be demonstrated. The main role of adrenal mass biopsy is for patients with an extra-adrenal primary malignancy, or history thereof, to differentiate between a metastasis to the adrenal vs. a primary adrenal tumor. In this setting the biopsy has a high degree of accuracy and should be strongly considered.

If surgery is needed, what approaches and perioperative considerations are important?

If surgery is needed, what approaches and perioperative considerations are important?

MIS surgery is typically performed for adrenal tumors with excellent results and is the preferred approach except for very large or locally invasive lesions. In the latter circumstance an open approach should be considered. For patients with subclinical Cushing's syndrome, steroid coverage should be provided perioperatively, and an ACTH stimulation test should be considered postoperatively to assess functional status of the contralateral adrenal gland. Patients with pheochromocytoma mandate careful perioperative management with alpha blockers with or without beta blockers (but always alpha first or risk of vascular collapse), preoperative volume expansion, careful intraoperative monitoring and use of short acting agents like nitroprusside. The tumor should be dissected off of the patient (another way of saying that it is important to avoid excessive manipulation) and the anesthesiologist should be notified prior to clipping the adrenal vein, a step that should occur early in the procedure. Patients with aldosterone secreting tumors should receive potassium sparing diuretics and potassium repletion preoperatively as necessary.

Selected Reading

Mandeville J and Moinzadeh A: Adrenal Incidentalomas, *AUA Update Series* 2010;29(4):34-40.

Topic:

Oncology: Adrenal Tumors

Subtopics:

Incidental Adrenal Tumor