

The Incidentally Discovered Adrenal Mass

Jennifer DeBerry DVM, DACVIM
Veterinary Specialty Hospital of San Diego
November 13, 2008

Adrenal “incidentalomas”

- The use of non-invasive imaging techniques has increased
- Adrenal masses are being detected in animals without clinical signs of endocrine disease
- Adrenal masses are discovered in 1-10% of humans being imaged for non-endocrine diseases

Differential Diagnoses:

- Adrenal Cortex
 - Nodular hyperplasia
 - Adenoma
 - Adenocarcinoma
- Adrenal Medulla
 - Pheochromocytoma
 - Ganglioneuroma
- Other Adrenal masses
 - Myelolipoma
 - Granulomatous disease
 - Teratoma
 - Adrenal cyst
 - Hematoma

Differential Diagnoses

- Metastasis
 - Lymphoma
 - Mammary gland tumors
 - Leukemia
 - Pulmonary adenocarcinoma
 - Other carcinomas (prostatic, gastric, bladder)
- Pseudoadrenal Masses
 - Kidney
 - Spleen
 - Pancreas
 - Lymph nodes
 - Blood vessels
- Technical artifacts

Functional Adrenal Tumors

- Hyperadrenocorticism (Cushing's syndrome)
- Pheochromocytoma
- Hyperaldosteronism (Conn's syndrome)
- Hypersecretion of sex hormones

Realistically...

- Is the tumor secreting glucocorticoids?
- Is the tumor secreting catecholamines?
- Is the tumor causing the clinical signs the pet is presenting with?
- Now what?

Diagnostic approach

- Review history, PE, clinicopathologic findings (CBC, Chemistry panel, UA)
- Assess contralateral adrenal gland
- Evaluate for hyperadrenocorticism

Hyperadrenocorticism

- Most common adrenal tumor
- Adenoma or adenocarcinoma
- May have minimal classic clinical signs !
- Contralateral adrenal atrophy
- Adrenal function tests

Question to be answered

- Is this tumor secreting glucocorticoids?
This question can be answered with:
 - HDDST
 - endogenous ACTH

Other tests for Cushing's

- Screening tests for Cushing's may not be helpful
- 40% of dogs with adrenal dependent HAC will have a normal ACTH stimulation test
- Lack of suppression on LDDST does not rule out PDH

Adrenal-dependent Cushing's

- High dose dexamethasone suppression test
 - Most specific test to r/o adrenal dependent Cushing's

Adrenal-dependent Cushing's

- HDDST fails to suppress
- Contralateral adrenal atrophy
- Undetectable endogenous ACTH
- Consistent with cortisol secreting tumor

What if the contralateral gland is large?

- Adrenal hyperplasia due to PDH
 - 25% of dogs with PDH will not suppress on HDDST
 - Endogenous ACTH should differentiate
- Second tumor (pheo, non-functional, other)
- Adrenal function tests can be confusing if both PDH and adrenal dependent Cushing's are present

Adrenal-dependent Cushing's

- HDDST suppresses adequately:
 - Rules out cortisol secreting tumor
 - PDH with asymmetrical hyperplasia
 - Other types of tumors
- If Cushing's is still suspected clinically, pursue work-up for PDH
 - LDDST, ACTH stim, Uco:cr

Pheochromocytoma

- Hypersecretion of catecholamines
- Clinical signs due to episodic hypertension
 - panting, weakness, anorexia, weight loss, syncope, "anxiety", tachycardia, skin flushing
- May invade local vasculature

Pheochromocytoma

- Demonstrate hypertension
- Hypertension present with many adrenal tumors
 - Hyperadrenocorticism
 - Pheochromocytoma
 - Hyperaldosteronism
- Repeat blood pressure several times
 - Normal blood pressure does not r/o a pheo!

Pheochromocytoma

- Usually incidental finding at necropsy
- Urine and serum catecholamines
 - Abstract at ACVIM in June showed correlation with urine normetanephrine: creatinine ratio
 - Commercial test is not yet validated in veterinary species
- Diagnosis of exclusion
- Often incidental finding at necropsy

Hypersecretion of sex hormones

- Androgens, estrogens, progesterones, precursors
- Not common in dogs and cats (common in ferrets)
- Clinical signs include endocrine pattern alopecia, PU/PD, or may be non-specific
- Diagnostic tests
 - Adrenal sex hormone levels pre and post ACTH

Hyperaldosteronism

- Very rare in veterinary patients
- Clinical signs due to hypokalemia and hypertension
 - Weakness, lethargy, ventral neck flexion
- Diagnostic tests
 - Hyponatremia, hypokalemia
 - Aldosterone levels pre and post ACTH

Surgical treatment

- Treatment of choice if when:
 - Tumors are functional
 - Tumors are large (>3cm)
 - Tumors are invading local blood vessels

Adjunctive medical therapy

- Adrenergic blockers for suspected pheos
 - Phenoxybenzamine for 2 weeks prior to surgery
- Glucocorticoids for cortisol secreting tumors
- Glucocorticoids and mineralocorticoids for bilateral adrenalectomies

Medical treatment

- Trilostane or Lysodren (O'PDDD, Mitotane)
 - Occasionally effective
 - May need higher doses
 - Monitor therapy with ACTH stimulation test
- **ONLY TREAT IF THERE ARE CLINICAL SIGNS!**

Benign neglect

- No clinical signs of adrenal disease
- Owner declines surgery
- Very old or debilitated patients
- Monitor for clinical signs of adrenal disease
- Re-evaluate ultrasonographically every 1-3 months
 - Rapid growth
 - Invasion of vessels

When an adrenal mass is found:

- Rule out Cushing's syndrome
- Pre-treat with phenoxybenzamine if a phео is suspected (i.e. Cushing's is ruled out)
- Surgery for functional, large, or invasive tumors
- Wait and watch if surgery is not performed