PITUITARY

- Anterior
  - Thyroid Stimulating Hormone (TSH)
  - Prolactin (PRL)
  - Growth Hormone (GH)
  - Corticotropin (ACTH)
  - Luteinizing Hormone (LH)
  - Follicle Stimulating Hormone (FSH)

- Posterior (hormones made in the hypothalamus and stored in pituitary)
  - Vasopressin
  - Oxytocin
PITUITARY TUMORS

Tumors-usually benign adenomas
- Common tumors, 70-80% are functional
- Microadenoma:<1cm; macroadenoma:1+ cm
- can cause
  - bitemporal hemianopsia
  - hypopituitarism
  - headaches
  - amenorrhea
  - galactorrhea
  - growth/puberty delay
  - infertility
  - decreased libido/erectile dysfunction
PITUTARY TUMORS

• If suspected or being followed, order MRI of head attn: sella with and without contrast

All pituitary tumors require testing for hormonal secretion and pituitary insufficiency. Visual fields must be checked if tumor is large. Follow-up MRI obtained. Surgery usually recommended if visual field defects or growth of tumor.
NON-SECRETORY PITUITARY TUMORS

• Non-secretory tumors
  Can be incidental microadenomas.

  Can be large and might cause partial or full hypopituitarism and visual field defects.
PROLACTINOMA

-Prolactinoma
  - galactorrhea, infertility, amenorrhea, decreased libido
    (note: prolactin elevation is generally proportional to size of tumor)
  - Treatment
    - cabergoline (Dostinex); Bromocriptine (Parlodel); rarely surgery
PROLACTIN ELEVATION

• Other Causes of mildly elevated prolactin
  - Dopamine antagonists
    - metoclopramide
    - many anti-psychotics (halol, risperidone)
  - pituitary stalk compression from pituitary macroadenomas or non-pituitary tumors
ACROMEGALY

- Acromegaly-growth hormone excess
  - Treatment
    - surgery, octreotide, pegvisomant, radiation therapy
TSH secreting tumor

TSH secreting tumor - rare

- elevated TSH and free T4

(note: in a patient with chronic hypothyroidism, there might be significant pituitary thyrotroph hyperplasia noted on MRI. However, the TSH in this case will be high and the free T4 usually very low)
CUSHING’S DISEASE

-Cushing's Disease-ACTH secretion
  - obesity, striae, ecchymoses, hyperglycemia, atherosclerosis, thin skin, fatigue, fat pads (espec. supraclavicular), hyperpigmentation, infections
  - Diagnosis
    - 24 hour urine free cortisol.
    - dexamethasone suppression test
    - Midnight salivary cortisol
  - Treatment
    - surgery, radiation
Dexamethasone suppression testing

• Low dose overnight:

  1 mg dexamethasone at 11 pm. Fasting cortisol the next AM at 8AM. Normal result is suppression of cortisol to <2-3 mcg/dl.

If abnormal, indicates possibility of cortisol excess and further testing is needed.

Note: obtaining a baseline ACTH level (without suppression) at some point might be helpful in patients who end up having abnormal low dose suppression testing.
Dexamethasone suppression testing

• High dose overnight suppression testing:
  Obtain baseline cortisol level and ACTH.
  Give 8 mg dexamethasone at 11 pm that night.
  Fasting cortisol level the next AM at 8 AM.

Normal is a >50% reduction in cortisol.
Dexamethasone suppression testing

• INTERPRETATION

Adrenal Cushings syndrome: failure to suppress cortisol with low dose dexamethasone testing and low ACTH level at baseline. Usually don’t need high dose dexamethasone test.
Dexamethasone suppression testing

• INTERPRETATION

Pituitary Cushing’s disease: failure to suppress cortisol with low dose dexamethasone test. Adequate suppression with high dose dexamethasone test generally.
Dexamethasone suppression testing

• INTERPRETATION

Ectopic ACTH:
Failure to suppress cortisol with low dose and high dose dexamethasone suppression.

High baseline ACTH level.
EMPTY SELLA

Fairly common

Often asymptomatic but can have partial or pan-hypopituitarism

Might be due to invagination of CSF into the sella, compressing the sella; pituitary infarction; etc.
Sellar extension of non-pituitary tumors

-Sellar extension of non-pituitary tumors
  - may cause elevated prolactin or diabetes insipidus by stalk compression;
  - might cause visual field defects;
  - might cause pituitary insufficiency

(note: any pituitary tumor large enough to cause pituitary stalk compression can cause mild prolactin elevation)
DIABETES INSIPIDUS

Diabetes Insipidus (DI)
- loss of vasopressin secretion (central DI)
- Complete or Partial DI
- inability to concentrate urine
- Hypernatremia, dehydration, elevated serum osmolality
- urine osmolality less than 290 with elevated serum osmolality
DIABETES INSIPIDUS

-Diabetes Insipidus (cont)

- Treatment
  - Replete fluids to correct serum sodium
  - DDAVP-IV, SQ, Nasal spray, oral
  - Vaptans (vasopressin receptor antagonist)
OTHER PITUITARY ISSUES

Head irradiation
  – can cause hypopituitarism years later
-Sheehan's Syndrome
  – post-partum pituitary necrosis
-Hemorrhage
-Hypothalamic Dysfunction
-Infiltrative Disease
-Autoimmune hypophysitis
HYPOPITUITARISM

- Hypopituitarism
  - Flu-like symptoms
    - Urgent diagnosis
    - Glucocorticoid replacement (Hydrocortisone 10-20 mg in am and 5-10 mg in pm, prednisone 5-7.5 mg daily, or equivalent)
    - testosterone/estrogen
    - thyroxine (TSH level not useful)
    - may need DDAVP, growth hormone
HYPOPITUITARISM

Dx:
- Symptoms
- Low FSH in post-menopausal woman not on estrogen
- Low total and free testosterone and LH
- Low sodium; possibly high potassium
- Possibly low morning cortisol or possibly abnormal ACTH stimulation test
- Low TSH and low free T4
CASE 1

CASE 2

60 year old centrally obese patient, 80 pound weight increase in one year. Type 2 diabetes mellitus for 3 years. Tanned skin. Leg weakness. Violaceous new stretch marks.
CASE 3

PITUITARY

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