Urology CHEAT SHEETS by RAEU GRUPO DE RESIDENTES Y JÓVENES URÓLOGOS
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ADRENAL PATHOLOGY

Two distinct zones in origin and function: cortex and medulla. Arterial blood supply: variable (inferior phrenic, aorta, renal)
Venous drainage: inferior vena cava in the right side, and to the renal vein in the left

PHYSIOLOGY:

LOCATION	ZONE	SECRETION	PATHOLOGY
Cortex (90%)	Glomerulosa	Mineralocorticoids (aldosterone)	Hiperaldosteronism Ald secreting carcinoma
	Fasciculata*	Glucocoticoids (cortisone, cortisol, corticosterone)	Adrenal Cushing Cortisol secreting carcin.
	Reticularis*	Sexual hormones (dehydroepiandrosterone, androstendione,testosterone, progesterone, estrogens)	Hiperandrogenism
Medulla (10%)		Noradrenaline 20% Adrenaline 80%	Pheochromocytoma Malignant-pheochro

*Overlap can occur with hormone synthesis and pathologies between fasciculata and reticularis

Adrenal incidentalomas:
-Non-functioning adenoma 80%
-Functioning adenoma 10%
-Malignant tumors <10%

ALL ADRENAL INCIDENTALOMAS MUST HAVE A METABOLIC EVALUATION
Masses > 6cm high suspicion of malignancy
Biopsy: differentiate benign- metastatic
Functional examination of the incidentaloma: determine if it is functional or suspected of malignancy
Clinical, hormonal and radiological **evaluation.**

HIPERCOTISOLISM – CUSHING'S SYNDROME

-Suspect: Stretch marks, fragile capillary, acne, hirsutism, central obesity, hump, full moon-face, HT, muscular weakness

-Causes:

ACTH.dependent 80%	ACTH.independent 20%	Pseudo-Cushing
-Cushing's disease -Ectopic secretion ACTH or CRH (lung, thymus, pancreas)	-Adrenal adenoma -Adrenal carcinoma -Micro/macronodular hyperplasia	-Major depression -Alcoholism

-Diagnostic tests: Screening:
-Dexamethasone 1mg suppression: + if cortisol >1.8mcg/dL(50nmol)
-Nocturnal salivary cortisol: Positive if elevated
-Free urine cortisol (24 hours): Positive if >3x normal
Confirmation:
Nocturnal salivary cortisol
Weak dexamethasone 2mg suppression test + CRH stimulus

PRIMARY HYPERALDOSTERONISM – CONN'S SYNDROME

-Suspect: HYPERTENSION (HT) + HipoK+, HT + adrenal mass, HT>150/100 3 different times in 3 days, HT not controlled by three medications

-Causes: Bilateral idiopathic hyperplasia: 65-75%
Aldosterone producing adenoma: 25-35%

-Diagnostic tests
-1st: Plasmatic aldosterone/renin ratio (ARR):
Positive if ARR ≥20 + aldosterone >15ng/ml
K sparing diuretics must be stopped before test
-2nd: Confirmation tests:
Oral overload with Na (6g/d for 3 days -> 24h urine)
IV overload with Na (2000cc 0,9% for 4h -> plasma)
Fludocortisone suppression test (0,1mg c/6h for 4 days)
-3rd: localization: unilateral vs bilateral
Diagnosis if unilateral adenoma 1-2cm
If doubts, adrenal vein catheterism

-Treatment: Unilateral: surgical resection
Bilateral: spironolactone, eplerenone

ADRENAL CARCINOMA

-Generalities. Rare and aggressive (0.05-0.2% of all cancers)
-Adrenal cortical carcinoma **functional in 80% of times**
-2-6% are bilateral and associated to hereditary syndromes: Li-Fraumeni, Beckwith-Wiedemann, MEN-1, McCune-Albright and, Carney complex

-Most frequent presentation: Cushing's Sd (33-53%), Cushing's Sd with virilization (20-24%), virilization only (10-20%), feminization (6-10%)

-Treatment
-**Surgical resection**. Limit between choosing open or laparoscopic/robot assisted: 6cm
-**If M+:** Mitotane (response in 20-40%, symptom relief in 70%)
-Agents used to alleviate severe symptoms: Metyrapone, aminoglutethamide, ketoconazole

PHEOCHROMOCYTOMA

The 10%'s rule:10% bilateral/multiple.10% children.10% extraadrenal.10% malignant.10% recur after surgery.10% incidentalomas

-Generalities: Medulla: Pheochromocytoma. Sympathetic ganglia: Paraganglioma.
Lifetime surveillance: up to 16% recurrences
Around 25% associated to hereditary syndromes: MEN2A, MEN2B,VHL,NF-I..

-Presentation: TYPICAL TRIAD IN 30-50%: HEADACHE, PALPITATIONS, SWEATING.
Paroxistic hypertension 30-50%. HT crisis induced by anesthesia, labor, biopsies, thiamine

-Diagnosis.1 Screening: Fractionated plasma metanephrines (99% sensitivity)
-2 Confirmation:24-h urine metanephrines and cathecholamines (99% specificity)
-3 Localization: CT: heterogeneous mass with necrosis/hemorrhage, >10UH without contrast, >100UH with contrast
- **MRI:** T1: low intensity while in T2: high intensity (lightbulb sign)
- **MIBG:** scintigraphy is used if suspicion of extra adrenal foci

-Treatment. Surgical resection. Vein must be ligated first in all cases
Surgical pre-op preparation: 1º Alpha block: fenoxibenzamina for 2 weeks
2º Beta block: propranolol, 3º Hydration: IV saline
-Minimally invasive (lab/robotic) if <6cm.
-Post-op: if benign and asymptomatic, no more treatment

RADIOLOGIC PRINCIPLES OF ADRENAL PATHOLOGY

	ADENOMA	CORTICAL CARCINOMA	PHEOCHROMOCYTOMA	MYELOLIPOMA
CT without contrast	If <10 UH: Adenoma If <4cm: benign	>6cm in 90% >25UH Heterogeneous, irregular With calcifications and necrosis	>10UH without contrast Heterogeneous With hemorrhage and necrosis	<0 UH Fat and hematopoietic tissue
CT with contrast	Fast washout (>50% 10-15min)	Washout <40% in 10-15min Can be confused with metastases or lipid-poor adrenal adenoma (20-40UH, washout >50%)	>100UH with contrast	
MRI	T1: Loss of signal is out of sequence phase	*Only if CT is inconclusive: T2: high intensity, heterogeneous if contrast	T1: Low intensity T2: High intensity (lightbulb sign) in fat suppression phase	T1: High intensity, loss of signal in out of phase sequence T2: High intensity