76F with Headache, Confusion & Low Thyroid Function Tests

Isabel Casimiro, MD, PhD

10/27/16

HPI

- Hx of endometrial cancer (s/p surgery) in remission, CKD, CVA with R sided weakness & wheelchair bound
- Lives with son at baseline who is primary caretaker
- Presented to ED for 3d deteriorating mental status & headache
- She has been less conversational/interactive and not interested in eating for 1d
- On day of presentation Pt took 2 tramadol and 2 tylenol 3's for headache without improvement

PMH

- Endometrial cancer
- CKD stage 3
- CVA 1999 w residual R sided weakness
- DM 1999
- HLD
- MNG, nontoxic
- OA
- Cataract
- HTN

Family Hx

Father: Lung cancer
Son: T2DM

Social Hx

Lives with her son who is main caretaker and has a homemaker that comes in 3x/week.
Hx tobacco use, quit in her 30s, no EtOH or IVDU

Medications

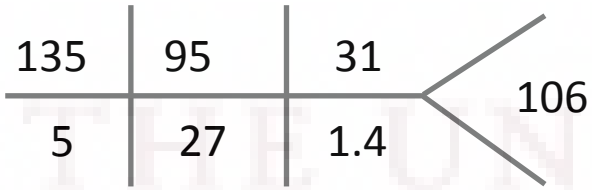
- Albuterol
- Asa 81mg
- Symbicort
- Calcium-vit D (500mg-200U) BID
- Iron
- Gabapentin
- Lantus/Novolog no longer taking
- Miralax
- Simvastatin 40mg daily
- Tramadol 50mg

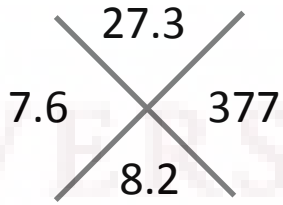
Initial Exam

- **VS: 136/69, HR: 74, RR: 21, Temp: 35.3 C, Wt: 190 lb, Ht 5'5"**
- **GENERAL:** Awake, alert and oriented x 3 in severe distress.
- **HEENT:** Atraumatic, EOMI
- **NECK:** Supple; No gross deformity
- **LUNGS**: Good air entry bilaterally, clear breath sounds
- **HEART:** Regular, rate and rhythm without murmurs.
- **ABDOMEN:** Soft, non-tender, non-distended
- **BACK:** No gross deformity
- **EXT:** No cyanosis. No clubbing. Warm well perfused. No gross deformity.
- **SKIN:** Warm and well perfused. No rashes or bruising.
- **NEURO:** CN 2-12 grossly intact.

ROS: + headache, + nausea

Labs

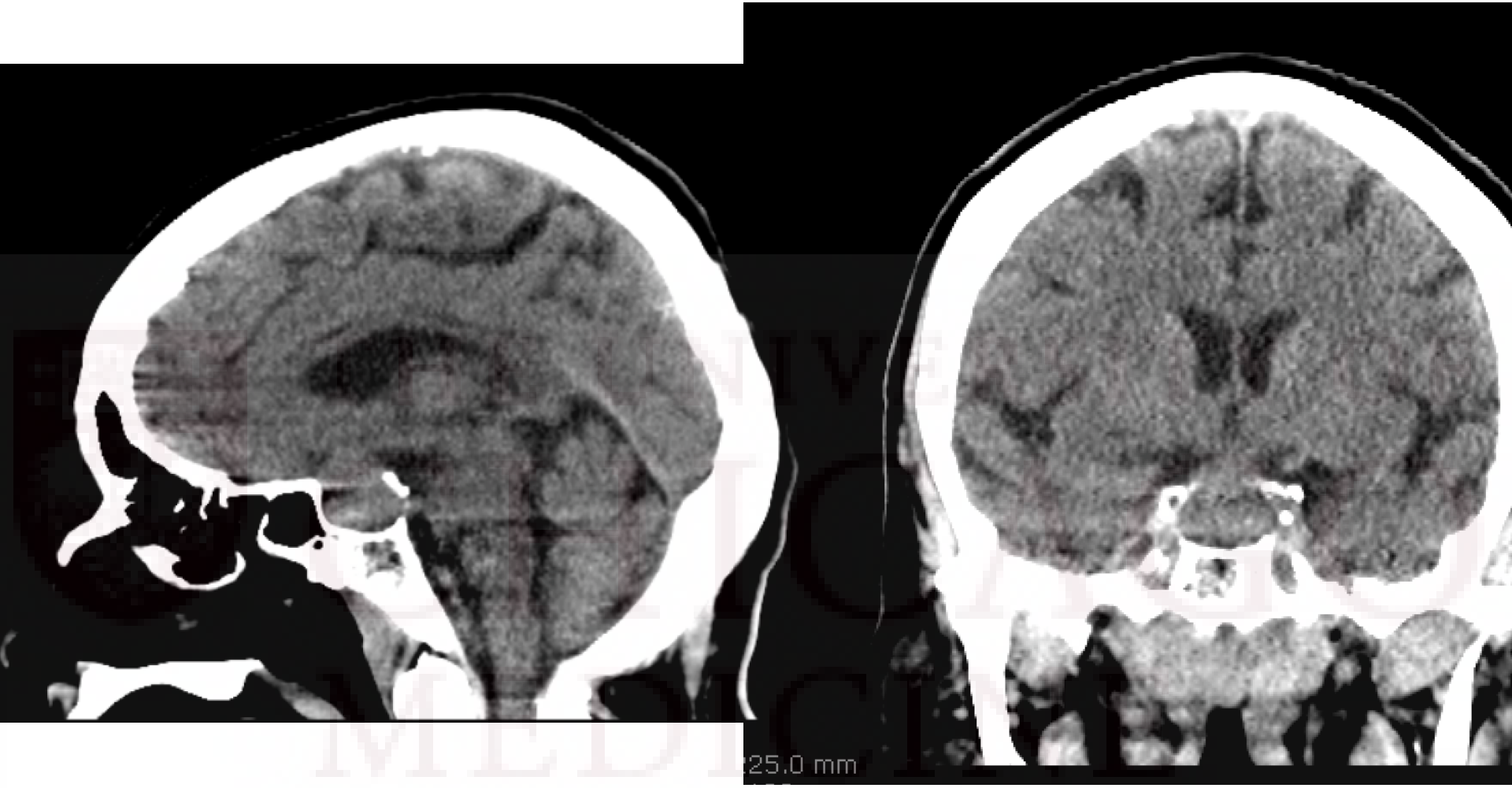


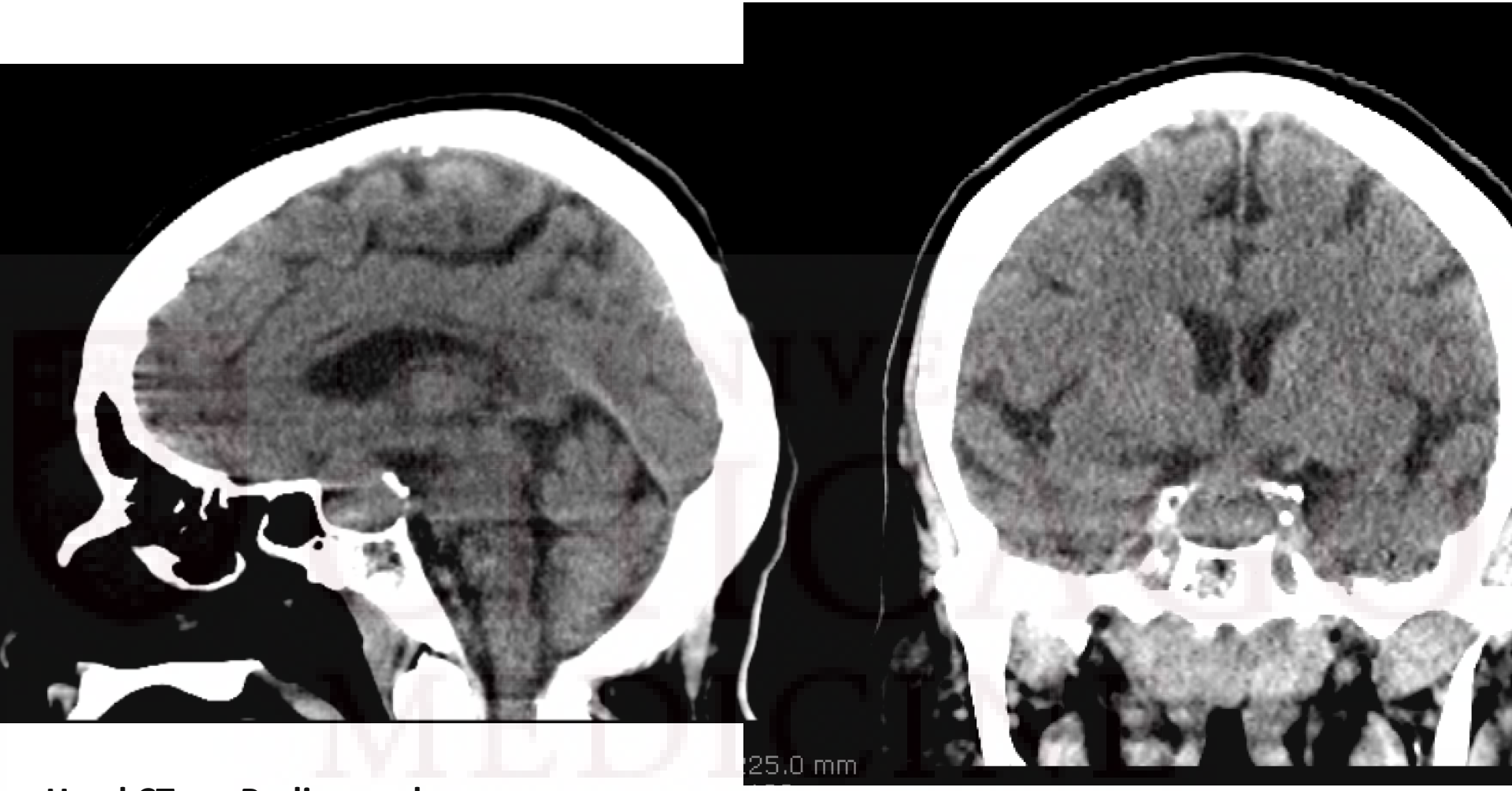


Ca++ 8.5
Mg 1.8
Phos 4.7

Protein: 8.6
Albumin: 4
Bili: 0.3,
Alk phos: 82
ALT: 17
AST: 10

UA: pH: 6,LE +, nitrite negative, protein: 1+, blood 1+, gluc neg, ketones + WBC: >20, RBCs 3-5


25.0 mm



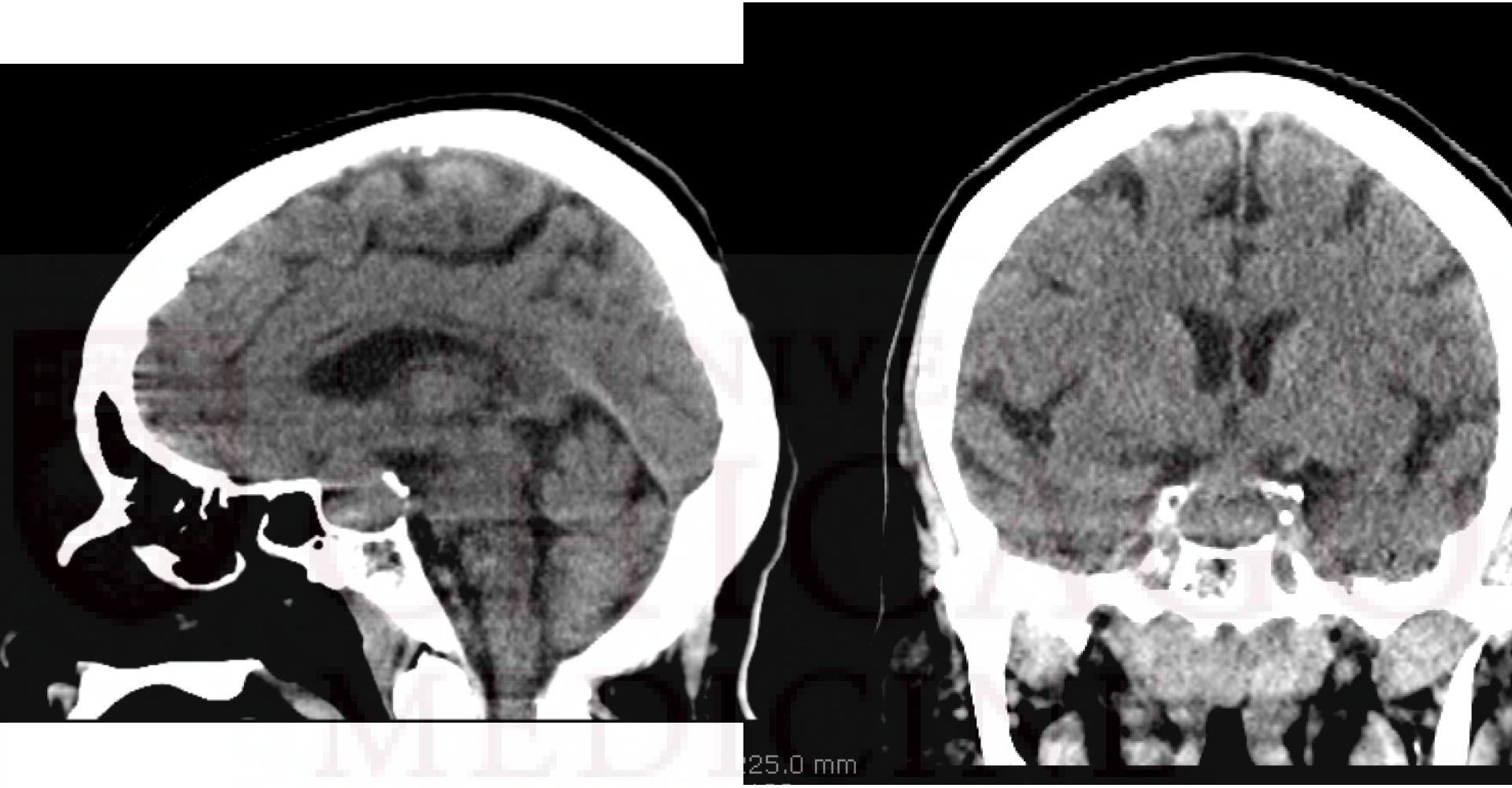
Head CT wo Prelim read:

No evidence of acute intracranial hemorrhage, edema, or mass effect. The pituitary gland appears enlarged. Differential for this is long on this noncontrast head CT, however includes pituitary macroadenoma. Recommend dedicated MRI when clinically warranted. Left maxillary sinus is completely opacified which can be seen in the setting of sinusitis given the correct clinical context. Discussed with ER

Next Steps ?

Next Steps

- “No visual field deficits on exam”
- PLAN: Message sent to PCP for f/u MRI & sent home by ambulance



Head CT wo Final read:

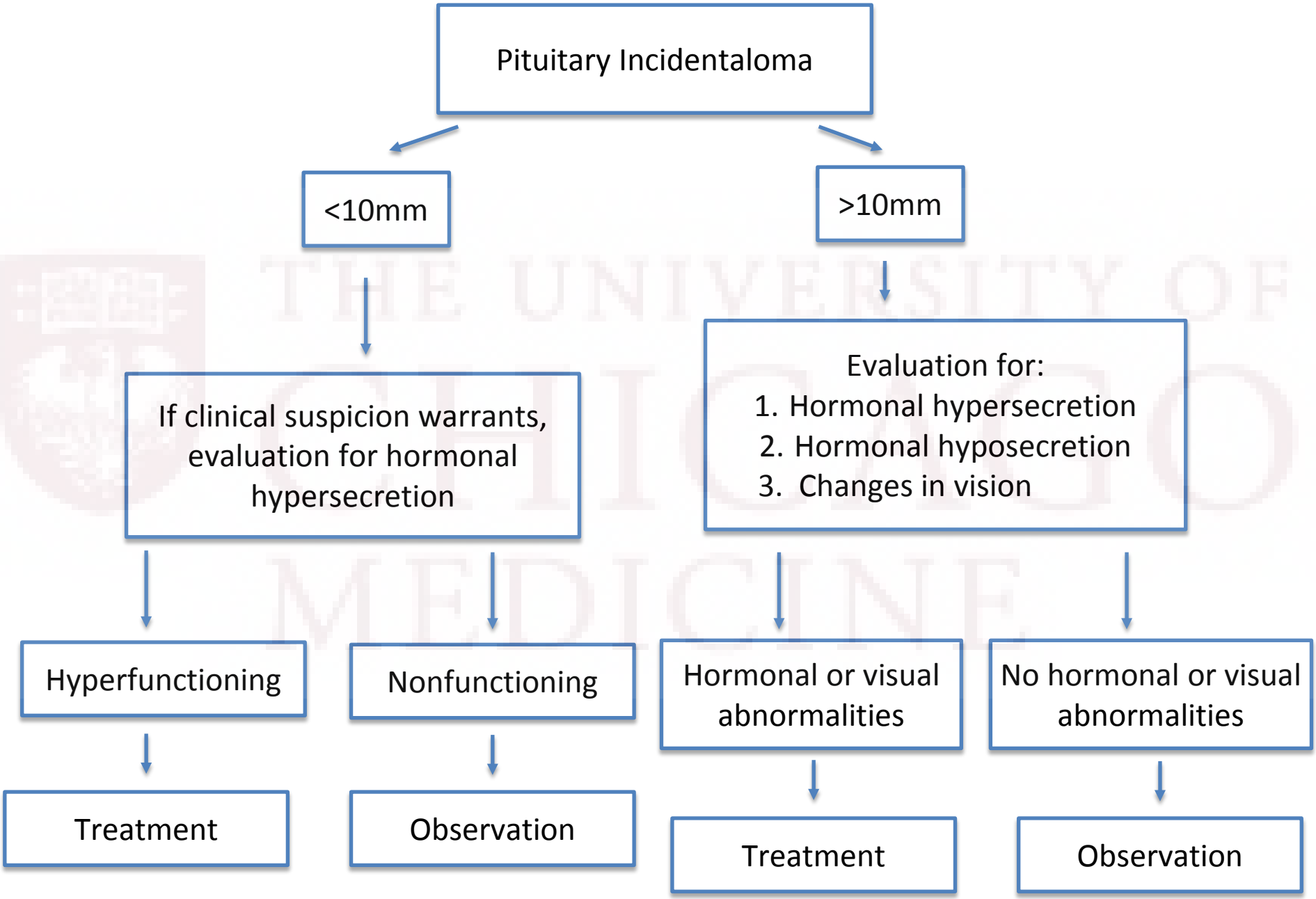
A masslike lesion is evident involving the sella and suprasellar cistern. The differential would include a pituitary macroadenoma as well as a meningioma among other possibilities. Further evaluation with contrast-enhanced MRI is recommended.

Differential for Sellar Mass

Differential for Sellar Mass

- Benign tumors:
  - Pituitary adenomas
  - Pituitary hyperplasia
  - Other benign tumors: Craniopharyngioma, Meningioma, Pituicytoma (glioma from pituicytes in post pituitary, no hormonal secretory function)
- Malignant Tumors (Germ cell tumor, sarcoma, chroma, pituitary carcinoma)
- Metastatic disease (lung, breast)
- Cysts (Rathke's cleft, arachnoid, dermoid cysts)
- Abscess
- AVF of cavernous sinus
- Hypophysitis (lymphocytic infiltration of pituitary)

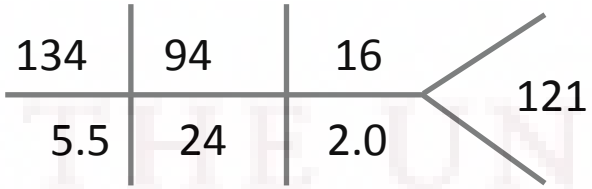
Pituitary Incidentaloma

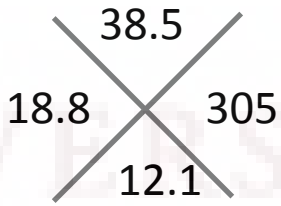

Pituitary Incidentaloma
<10mm
>10mm
If clinical suspicion warrants, evaluation for hormonal hypersecretion
Evaluation for:
1. Hormonal hypersecretion
2. Hormonal hyposecretion
3. Changes in vision
Hyperfunctioning
Nonfunctioning
Hormonal or visual abnormalities
No hormonal or visual abnormalities
Treatment
Observation
Treatment
Observation

Back to Our Patient

- Two days later family brings her back to ED with deteriorating mental status & continued headache
- Found to be febrile (38.8 C) & hypotensive (80s/50s) with lactic acid 1.7 -> admitted to the MICU
- Mumbles to sternal rub
- UA from initial ED visit: *Providencia stuartii* sensitive to ertapenem; Abx started
- Pressors initiated due to hypotension

Labs





Ca++ 8.5
Mg 1.8
Phos 4.7

Protein: 8.7
Albumin: 3.7
Bili: 1.0, bili-c: 0.3, bili-u: 0.7
Alk phos: 119
ALT: 57
AST: 39
Ammonia: 51
Lipase 22
Lactic acid: 1.7 -> 2.1

TSH: 0.08

UA: Providencia stuartii sensitive to ertapenem

Hospital Course

MICU admission exam:

- General: Ill appearing woman lying in bed, opening eyes to sternal rub, mumbling
- Eyes: No icterus
- ENT: No nasal discharge, oropharynx pink and without exudate or erythema, membranes moist

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Day 5 of MICU admission:

- Mental status improved with Abx, but not back to baseline per family;

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Day 5 of MICU admission:

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Exam:

- Gen: pleasant & non-distressed, sleepy on exam, laying in bed
- HENT: won't open L eye, R eye normal. Per family in room she had not been opening any eyes and her right eye was similar, will reassess tomorrow, dobbhoff in place at 50 cm
- “Eye weakness: believed to be due to residual weakness as a result of sepsis picture”

Hospital Course

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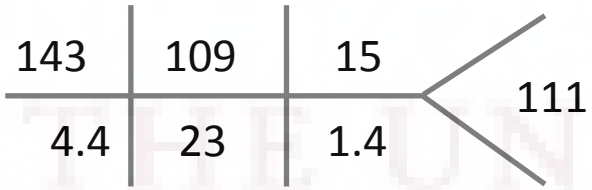
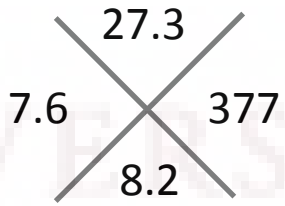
- "Eye weakness: believed to be due to residual weakness as a result of sepsis picture"
- **TSH 0.05 (previously 0.08), T4 & T3 checked on Day 6; also low**
- **Endocrine consulted for low TSH… "oh and she had a head CT concerning for sellar mass"**

Physical Exam

- VS: BP 101/58, HR: 87, Temp 37.8 C, rr: 20, Ht: 5’5”, Wt: 216 lbs, BMI 35.9
- Constitutional: **Overweight female in no acute distress, easily confused but oriented and answers questions appropriately**
- HEENT: oropharynx clear; **L eye closed, when opened by examiner her eye is deviated to the L & unable to fully move it medially to midline**
- Neck: supple, no thyromegaly, no acanthosis nigricans
- Cardiovascular: regular rate and rhythm, nml S1/S2
- Pulmonary/Chest: good respiratory effort, clear to auscultation bilaterally
- Abdomen: soft, non-tender, nondistended
- Extremities: no edema
- Neurological: **somewhat alert, follows most commands**
- Skin: warm, dry
- Psychiatric: not agitated

Labs





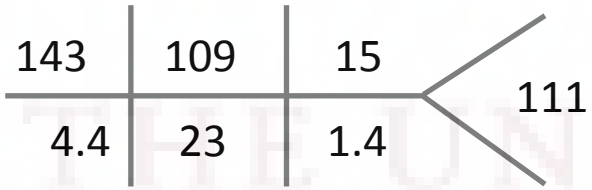
Ca++ 8.2
Mg 1.9
Phos 3.4

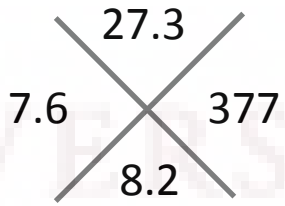
A1C: 5.3% (8% in 2014)

TSH: 0.05 (0.3-4)
fT4: 0.54 (0.9-1.7)
T3: 58 (80-195)

What labs would you ask team to order?

Labs





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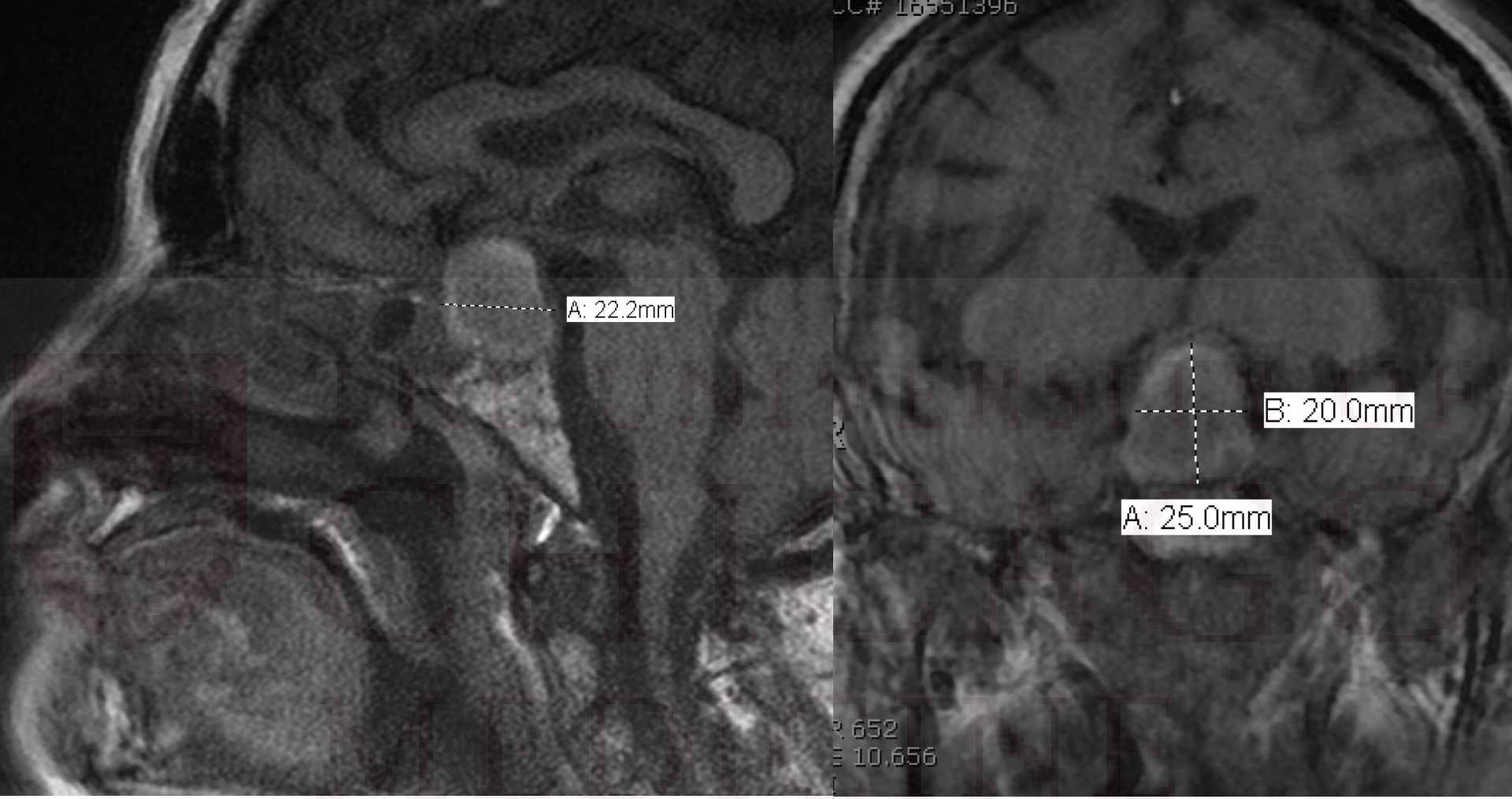
Lab add ons:
-FSH
-LH
-Prolactin: 1.5 (5-23)
-IGF-1
8 am cortisol & ACTH



MRI pituitary:

1. Apparent diffusion restriction in the corpus callosum is incompletely evaluated. Differential considerations would include recent ischemia or perhaps less likely a demyelinating process among other possibilities. MRI of the entire brain is suggested possibly with sedation to control for motion.

2. 2.5 cm sellar/suprasellar mass is favored to represent a macroadenoma versus meningioma.

Pituitary Adenomas

- Benign tumors of the anterior pituitary
  - micro adenomas <10mm
  - macro adenomas >10mm
- Most common cause of sellar masses after 30s
- Most adenomas present with signs of hyper secretion (hyperprolactinemia, HG excess or hypercortisolism); 25-30% are nonfunctioning (nonsecreting or silent)
- The can be lactotrophs (prolactin), gonadotroph adenomas (LH & FSH), somatotrophs (GH), thyrotroph (TSH) or corticotrophin (ACTH) adenomas
- Presentation: neurologic symptoms (visual impairment, or headache), incidental MRI finding, hormonal abnormality

Recommendations for Patient

- Assess HPA axis before starting GC replacement (am cortisol)
- Stress dose steroids started next day on 9/23
  - 50mg IV HC Q8hrs -> 50mg IV Q12hrs -> 50/25mg IV ->25/25 IV -> -> -> PO 50mg Q12hrs PO then to 40mg QAM and 20mg QPM -> 20/10 discharge dose

- LT4 started 9/24 at 50mcg daily; Why replace GC Before LT?
  - Thyroid hormones may precipitate acute AI since they increase metabolic clearance of glucocorticoids

- Neuro, Ophtho & NSY consulted

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SPECIAL FEATURE

Clinical Practice Guideline

Hormonal Replacement in Hypopituitarism in Adults: An Endocrine Society Clinical Practice Guideline

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ENDOCRINE SOCIETY

SPECIAL FEATURE

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"In the elderly, the treatment of hypopituitarism requires expertise & should be based on elementary norms of prudence."

-Curto et al., Journal of Endocrinological Investigation 2016 (39)10: 1115-1124

Diagnosing Central Adrenal Insufficiency

- Serum cortisol levels should be measured at 8-9am (first line for central AI diagnosis)
- Using a random cortisol level to diagnose AI is **not recommended**
- Cortisol level <3 ug/dl indicates AI, >15 ug/dL likely excludes diagnosis
- Corticotropin stim test when morning values are between 3-15ug/dL
- Peak cortisol levels <18.1 ug/dL (500 nmol/L) at 30 or 60 mins indicates AI
- Testing should be done 18-24 hrs after last HC dose

Signs of ACTH deficiency in the elderly

Signs and symptoms	Life-threatening adrenal crisis (weakness, nausea, fever, shock)
	Weight loss
	Low energy
	Hypotension
	Hypoglycemia
	Hyponatremia
	Hyperkalemia
Diagnosis	Early morning cortisol levels <3 ug/dl
	Low-dose ACTH stimulation test (1 μg, i.v.) with cortisol peak <18.1 ug/dL
Therapy	Replacement therapy with cortisone acetate (25–37.5 mg/die) or hydrocortisone (15–25 mg/die)
Therapy monitoring	Clinical evaluation: search for signs and symptoms of cortisol under- and over-replacement
	Half-yearly control of cortisol levels in the morning and afternoon after taking hydrocortisone or cortisone acetate (useful if levels are too low)

-Curto et al., Journal of Endocrinological Investigation 2016 (39)10: 1115-1124

Glucocorticoid Replacement

- HC is recommended usually 15-20mg total daily in single or divided doses
  - Highest dose in the morning at awakening
  - Second dose in the afternoon
- Use of longer acting GCs should only be used in selected cases (nonavailability, poor compliance, convenience)
- Teaching regarding stress dosing & emergency GC administration is imperative
- Instruct Pts to obtain emergency card/bracelet/necklace regarding AI & emergency kit injectable high dose GC
- Recommendation against using fludrocortisone in patients with secondary AI

Our Pt: Sent home on HC 20mg QAM/10mgQPM

Signs of Low TSH in the Elderly

Signs and symptoms	Neuropsychiatric disorders
	Low energy
	Weight instability
	Bradycardia and hypotension
	Arthromyalgia
	Myopathy and neuropathy
	Hypothermia and hyponatremia
	Dry skin and hoarse voice
	Articular, pleural, pericardial and peritoneal effusion
Diagnosis	↓ FT4 levels with ↓ = TSH levels
	Poor sensitivity of FT3 levels
	Poor sensitivity of TRH test
Therapy	Replacement therapy with L-T4 (mean dose 1.2–1.4 μg/kg) titrated to bring FT4 levels into the 3rd–4th quartile of the target range
Therapy monitoring	Half-yearly control of FT4 levels

Thyroid Hormone Replacement

- LT4 doses sufficient to achieve serum FT4 levels in the mid to upper half of the ref range
- Approximate LT4 doses are **1.6ug/kg/d**, with dose adjustments based on clinical context, age, and FT4 levels (**1.2-1.4 ug/kg/d** for elderly)
- Do not use serum TSH to adjust thyroid replacement dosing, use fT4
- Suggest against treating CH with LT3, thyroid extracts or other formulations of thyroid hormones

  Our Pt: 86.2kg (@1.6 dose: 138mcg, @ 1.2 dose: 103mcg);
  At time of Discharge free T4 was 0.98 from 0.54 on 50mcg LT4;
  Sent home on 88mcg

Estrogen & Testosterone Replacement

- Gonadal hormone replacement is recommended in **premenopausal** women with central hypogonadism

- **Testosterone replacement in adult males** with central hypogonadism & no contraindications is recommended in order to:
  - prevent anemia, reduce fat mass, improve BMD, libido, sexual function, energy levels, sense of well being & muscle mass & strength

Signs of Gonadotropin Deficiency in the Elderly

Table 1 Main signs and symptoms, diagnosis and therapy of gonadotropin (FSH/LH) deficiency in the elderly

Signs and symptoms	Sexual dysfunction
	Mood disorders
	Gynecomastia
	Decreased muscle mass
	Decreased exercise tolerance (male)
	Low energy
	Impaired mental performance
	Decreased hair concentration
	Osteoporosis, infertility and anemia (male and female)
Diagnosis	↓ Testosterone total levels (male)
	↓ 17-β Estradiol levels (female)
	↓ = FSH and LH levels
	=FSH and LH levels with ↓ gonadal steroid hormones
Therapy	*Only in males* replacement therapy with testosterone (preferred transdermal or transmucosal systems to parenteral via)
Therapy monitoring	Half-yearly control of testosterone total levels:
	(1) Parenteral via: midway between injections
	(2) Transdermal or transmucosal systems: 3–12 h after application of transdermal patch or anytime, at least 1 week after starting on therapy, for gel preparation

GH Replacement Therapy

- Recommended for those with proven GHD & no contraindications
- GH stim test recommended
- Starting dose 0.2-0.4mg/d <60yo; 0.1-0.2mg/d >60yrs
- Titrate to maintain IGF-1 levels below the upper limit of normal & reduce dose for side effects
- Not recommended for elderly adults with low IGF-1 levels who have no hx of pituitary or hypothalamic disease
- Recommend against use for enhancing athletic performance

GH Replacement Therapy

- GHD is measured via insulin tolerance, glucagon & if available GHRH + arginine tests
- GH secretion is pulsatile, thus measuring basal circulating levels does not provide useful diagnostic information
- IGF-1 levels are reproducible & stable, but 20% of adults with GHD may have normal IGF-1 levels
- Recommend against biochemical testing for GHD in Pts w clear cut features of GHD & 3 other documented pituitary hormone deficits
- Because most GH tests have high false positives, one or more needs to be fulfilled for prescreening:
  - young adults that previously required GH therapy should be re-tested as adults before continuing GH therapy (many will have normal GH function as adults)
  - Have evidence of pituitary damage, including a Hx of pit surgery, RT, hypothalamic mass or infiltration, prior head trauma, or stroke

GHD Testing

Hormone Test	Procedure	Interpretation/Expected Normal Response
GH		
Insulin tolerance	Administer insulin, 0.05–0.15 U/kg iv. Sample blood at − 30, 0, 30, 60, 120 min for GH and glucose.	Glucose should drop <40 mg/dL, (2.2 mmol/L). GH should be >3–5 μg/L. Cutoffs for GH response are BMI related.
GHRH[a] + arginine	Administer GHRH, 1 μg/kg (max 100 μg) iv followed by an arginine infusion 0.5 g/kg (max 35 g) over 30 min. Sample blood at 0, 30, 45, 60, 75, 90, 105, and 120 min for GH.	Can give false normal GH response if GHD is due to hypothalamic damage (eg, after radiation). GH >4 μg/L, but cutoffs for GH response should be correlated to BMI. (Obesity may blunt GH response to stimulation.)
Glucagon	Administer glucagon, 1 mg (1.5 mg if weight >90 kg) im. Sample blood at 0, 30, 60, 90, 120, 150, 180, 210, and 240 min for GH and glucose.	GH >3 μg/L, but cutoffs for GH response should be correlated to BMI. (Obesity may blunt GH response to stimulation.)

Back to Our patient

Evaluated by Neurosurgery: "On my exam, her left CN3 palsy had started to improve... She continues with dysarthria."

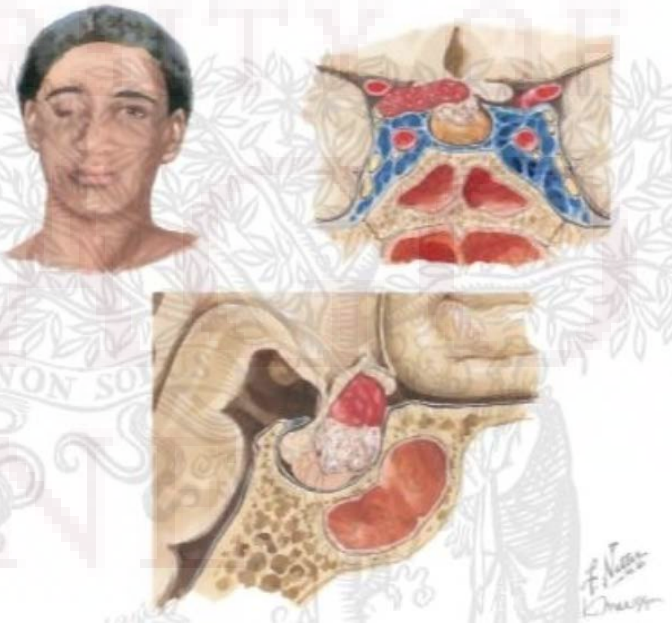
"Her imaging on CT and MRI is consistent with pituitary adenoma (less likely a sellar metastasis, not likely meningioma), and given the time course of symptoms I suspect she had some acute change in this lesion about 2 weeks ago when she developed headache and 3rd nerve palsy."

"Since there are no visible blood products in the tumor, this may be an infarcted pituitary adenoma (non-hemorrhagic apoplexy)."

"I would like to give her a few more days on hormone replacement… but this tumor is large and would be best addressed surgically"

Pituitary Apoplexy

- Life threatening syndrome occurring after rapid expansion of the contents of the sella turcica, caused by hemorrhage or infarction of pre-existing pituitary adenoma
- Reported incidence of apoplexy in pituitary adenomas is 2-7%
- Can lead to acute findings: headache, visual loss, diplopia, hypopituitarism
- Ocular motility dysfunction (OMD) due to CN palsies occurs in 40-100% of Pts
- There is no consensus on management (surgical vs conservative management)



Back to Our Patient

Eye Exam:

	Right Eye	Left Eye
VA (near card)	20/50	20/50
Pressure (tonopen)	17	17
Pupils	3 --> 2.5, brisk, no APD	4 --> 3.5, brisk, no APD
EOM	Full	4+ restriction medially, 2-3+ restriction sup
Alignment	LXT	
Confrontational Visual Fields	superotemporal peripheral defect	superotemporal peripheral defect
Cranial Nerves	Partial CN3, otherwise grossly full	

Slit Lamp Exam

	Right Eye	Left Eye
External	No masses, lacerations	2+ ptosis
L/L	+ blepharitis, no lash loss, entropion, ectropion	Ptotic, + blepharitis, no lash loss, entropion, ectropion
C/S	White and quiet	White and quiet
Cornea	Normal, no dendrites, pseudodendites, abrasions, or corneal defects.	Normal, no dendrites, pseudodendites, abrasions, or corneal defects.

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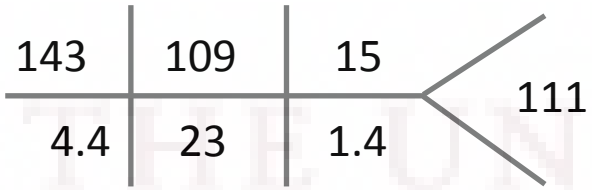
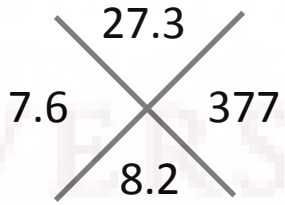
Ophtho Assessment: Partial L CN3 Palsy with some improvement since onset (4 days on steroids)

Back to Our Patient





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T3: 58 (80-195)

-FSH 0.5 (Postmenopausal: 20-135 mIU/mL)
-LH <0.1 (Postmenopausal: 13-44 mIU/mL)
-Prolactin: 1.5 (5-23)
-IGF-1: 16 (34-182ng/mL)
8 am cortisol 2.5 (6.8 to 26 mcg/dL)
ACTH 6.6 (<52 pg/mL)

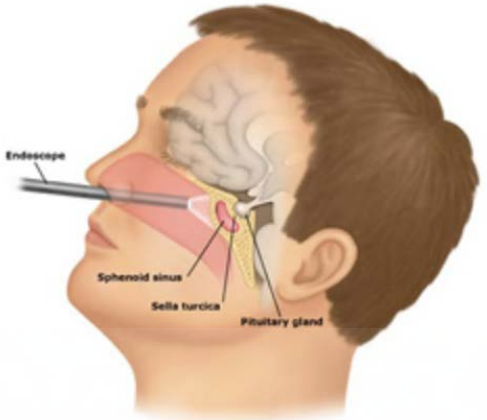
Management of Hypopituitarism in Pituitary Apoplexy

- We recommend testing for acute pituitary insufficiency in all patients with pituitary apoplexy

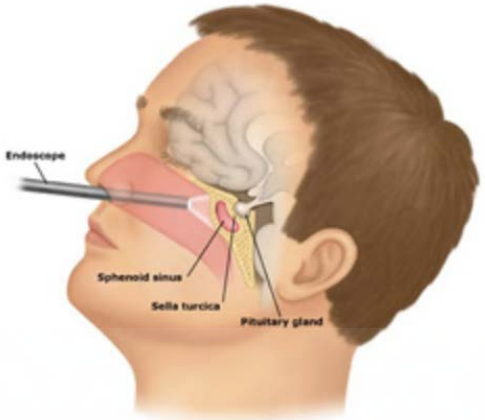
- Because AI is a major cause of mortality, we recommend GC therapy until a laboratory diagnosis is established & the patient maintains normal pituitary function

- We recommend that clinicians monitor pituitary axes in pituitary apoplexy patients treated **with either surgical decompression or conservative management** because hypopituitarism may develop over time

Pituitary Surgery



Pituitary Surgery



OR REPORT: “I immediately encountered slightly firm, necrotic appearing tumor under modest pressure”

FINAL PATH:
INFARCTED TUMOR CONSISTENT WITH INFARCTED PITUITARY ADENOMA, see comment.

Comment
No viable tumor is seen. The reticulin stain and the pattern of positive labeling for synaptophysin as well as the absence of cytokeratin Cam5.2 staining are all consistent with an infarcted pituitary adenoma.

Peri-operative management of Hypopituitarism

- Use of stress dose steroids in AI before surgery & tapered doses after surgery before repeating testing
- Use of LT4 before nonemergency surgery and throughout preoperative period is recommended
- Suggest initial therapy for DI be short acting sc aqueous ADH, allowing for safer use in the vast majority of cases in whom DI resolves spontaneously
- Prescheduled DDAVP doses in the first week post surgery is not recommended due to risk of hyponatremia after transient DI resolves and risk of SIADH that may occur 7-10d after surgery
- Suggest oral or intranasal DDAVP after d/c with clear instructions that Pts should only use medication if significant polyuria occurs
- Suggest retesting all pituitary axes starting at 6 weeks after pituitary surgery and then periodically to monitor the development or resolution of pituitary deficiencies

- Retrospective chart review of all Pts seen in Emory Pituitary Center between 1995-2012

- Out of 235 Pts with Pituitary apoplexy, 59 (25%) had ocular motility dysfunction (OMD)

Table 1. Features of Patients with PA With OMD and Without OMD

Characteristic	With OMD (n = 59)	Without OMD (n = 176)	*P* Value
Age at presentation, years, mean ± SD	48 ± 12	46 ± 17	0.47
M/F sex ratio (n)	1.10 (31/28)	0.63 (68/107)	**0.002**
Clinical presentation, n (%)			
Headaches	50 (85)	142 (80)	0.48
Altered mental status	8 (14)	9 (5)	**0.03**
Vomiting	14 (24)	30 (17)	0.25
Complaint of decreased vision	38 (64)	62 (35)	**<0.001**
Endocrine evaluation, n (%)			
Secreting adenoma	13 (22)	58 (33)	0.11
Panhypopituitarism	18 (31)	25 (14)	**0.005**
Endocrine deficiency (axes), n (%)			
Adrenal	17 (29)	36 (20)	0.18
Somatotropic	9 (15)	26 (15)	0.92
Thyroid	14 (24)	48 (27)	0.59
Gonadal	37 (62)	84 (47)	**0.04**
Prolactin	5 (8)	19 (11)	0.07
Radiologic evaluation, median (IQR)			
Maximum diameter, cm	2.6 (1.85–3.2)	2.01 (1.2–2.5)	**<0.001**

Hage, R., et al. 2016. Third, fourth, and Sixth Cranial Nerve Palsies in pituitary Apoplexy. World Neurosurgery. 94:447-452

- Pts with OMD were more likely to be men, have AMS, & present with visual loss;
- More likely to have panhypopituitarism

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CN Palsies & Visual Field Outcomes Before & After Neurosurgery

Table 4. CNPs and Visual Field Outcomes in the 24 Patients Seen by Neuro-Ophthalmology Before and After Surgery

	Before surgery	After surgery	*P* Value
CNPs, n			
III (partial; complete)	15 (10; 5)	5 (3; 2)	**0.04**
IV (partial; complete)	6 (3; 3)	4 (2; 2)	0.72
VI (partial; complete)	20 (13; 8)	6 (3; 3)	**<0.0001**
VA, logMAR, median (IQR)	0.28 (0.07—1.07)	0.1 (0—0.2)	**0.001**
VA <20/200, n			
In 1 eye	3	2	0.50
In both eyes	3	0	0.11
Visual fields (eyes)*			
Hemianopia, n/N (%)	22/36 (61)	16/48 (33)	**0.01**
Small, n	2	3	0.38
Partial, n	12	10	0.62
Complete, n	8	3	0.23
Visual fields (patients), n			
Bitemporal hemianopia	12	7	0.16
Homonymous hemianopia	0	0	—
Unilateral field defect	2	2	0.76
Visual field, MD, dB, median (IQR)	−5.98 (−10.42 to −1.72)	−3.13 (−5.65 to −1.44)	**0.002**

Significant *P* values are in bold type.
CNP, cranial nerve palsy; VA, visual acuity; IQR, interquartile range; MD, mean deviation.
*Visual fields were performed on 18 patients before surgery, and 24 after surgery.

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CN Palsies & Visual Field Outcomes Before & After Neurosurgery

Median VA improved from 0.28 preoperatively, to 0.1 postoperatively

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CN Palsies & Visual Field Outcomes Before & After Neurosurgery

Less hemianopia in Pts after surgery who underwent visual field examination

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CN Palsies & Visual Field Outcomes Before & After Neurosurgery

Out of the 25 Pts who underwent surgery:
-3 pts OMD resolved in 1 mo
-13 pts within 6 months
-17 pts within 1 year

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CN Palsies & Visual Field Outcomes Before & After Neurosurgery

Limitations:
-comparison between before and after surgery in Pts who almost all had surgery

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- Retrospective analysis of all patents referred to the Salford Royal NHS Foundation Trust (Tertiary Endocrine & NSY Center)

- 31 patients with pituitary apoplexy from 2005-2014
  - 11 managed conservatively (35%) & 20 were managed surgically (65%); of which 11 underwent emergency surgery & 9 elective (after 7d)
  - Conservative: appropriate hormonal replacement & monitoring visual symptoms

Table 2. Presenting symptoms, predisposing factors and radiological findings in patients with pituitary apoplexy in our cohort

Symptoms	Number (% total)
Headache	31 (100%)
Nausea or vomiting	17 (55%)
Visual symptoms	25 (81%)
Visual field defect	18 (58%)
Reduced visual acuity	7 (23%)
Ocular paresis	12 (39%)
CNIII	8 (26%)
CNVI	6 (19%)
Predisposing factors	11 (35%)
Hypertension	5 (16%)
Oral anticoagulation	3 (10%)
Heparinisation	1 (3%)
Pregnancy	1 (3%)
Previously known adenoma	1 (3%)
MR findings	
Microadenoma (<1 cm)	0 (0%)
Macroadenoma (1–2·5 cm)	21 (68%)
Giant adenoma (>2·5 cm)	10 (32%)
Median maximum tumour diameter (mm)	20·4 (11–45)
Radiological evidence of haemorrhage/infarction	29 (94%)

>50% of pts presented with headache, nausea/vomiting, visual symptoms or visual field defects

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Table 4. Extent of hypopituitarism at final follow-up in the patients with pituitary apoplexy, categorised with respect to management as described in Methods

Endocrine deficiency at final follow-up	Conservative, (N = 11)	Elective surgery (N = 9)	Emergency surgery (N = 11)	P value
Growth hormone	6/9 (67%)*	8/9 (89%)	9/11 (82%)†	0·30
Gonadotrophin	5/11 (45%)	7/9 (78%)	8/11 (73%)	0·33
ACTH	6/11 (55%)	6/9 (67%)	9/11 (82%)	0·40
TSH	6/11 (55%)	7/9 (78%)	7/11 (64%)	0·58
ADH	0/11 (0%)	0/9 (0%)	0/11 (0%)	NA
Total	8/11 (73%)	8/9 (89%)	10/11 (91%)	0·58

P value given for Fisher's exact test.
*GH status at follow-up could not be determined in two patients.
†One patient had ongoing biochemically active acromegaly.

Table 5. Recovery in visual symptoms at final follow-up in the patients with pituitary apoplexy, categorised with respect to management type as described in Methods. Only those patients with visual symptoms are included, as indicated by the denominator for each management group. There was no significant difference across groups (P = 0·841 Fisher's exact test)

Visual outcome	Conservative (N = 7)	Elective surgery (N = 8)	Emergency surgery (N = 10)
Return to premorbid vision	5/7 (71·4%)	6/8 (75·0%)	7/10 (70·0%)
Improved vision (but not back to premorbid level)	1/7 (14·3%)	2/8 (25·0%)	3/10 (30·0%)
No change in vision	0/7 (0%)	0/8 (0%)	0/10 (0%)
Deterioration in vision	1/7 (14·3%)	0/8 (0%)	0/10 (0%)

Rates of hypopituitarism at follow up were similar between the emergency surgical (91%), elective surgical (89%) and the conservative treatment groups (73%)

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Visual recovery was not significantly different between these 3 groups

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Limitations: Small study & retrospective

How to Manage Pituitary Apoplexy?

- Unfortunately the rarity & emergency nature of this condition limit the evidence base for management to mostly uncontrolled retrospective cases
- Neurosurgical proponents consider decompression the treatment of choice to improve visual outcomes & endocrine recovery
- However, others have noted that favorable visual and endocrine outcomes can be achieved with conservative management in the context of no progressive visual symptoms

UK Guidelines for the Management of Pituitary Apoplexy

Patients with pituitary apoplexy should first be stabilized medically with steroid replacement if needed

The decision to manage conservatively or with surgical intervention should be made carefully by a multidisciplinary team, including experts in neurosurgery, endocrinology and ophthalmology

Patients with pituitary apoplexy who are without any neuro-ophthalmic signs or mild and stable signs can be considered for conservative management with careful monitoring

-Formal assessment of visual fields and acuity should be performed every day until a clear trend of improvement is observed

- Deterioration in neurological status should prompt urgent senior medical review with consideration to proceed with surgery

Patients with severe neuro-ophthalmic signs such as severely reduced visual acuity, severe and persistent or deteriorating visual field defects or deteriorating level of consciousness should be considered for surgical management

Back to Our Patient

- Pt was treated for her hypopituitarism with hydrocortisone (HC 20/10), and levothyroxine (88mcg), we did not treat her GH axis
- Adrenal insufficiency stress instructions were provided & discussed with family
- She underwent resection of her sellar mass on 9/30/16, she did not develop DI
- Her ocular motility improved when steroids were started & she continued to improve after surgery
- Unfortunately a CXR during the hospitalization showed a 2cm LUL mass which was eventually biopsied & revealed poorly differentiated squamous cell carcinoma
- To f/u in Endo clinic on 11/4

Summary

- Pituitary adenomas commonly present with neurologic symptoms (visual changes, headache), a pituitary mass that is discovered incidentally, or with pituitary hypofunction

- Hormone replacement is imperative in Pts with hypopituitarism
  - Glucocorticoid replacement in central adrenal insufficiency
  - Thyroid hormone replacement in central hypothyroidism
  - Estrogen replacement in premenopausal women and Testosterone in males
  - GH replacement in those with proven GHD & no contraindications

- Pituitary apoplexy is caused by hemorrhage or infarction of the pituitary gland & usually presents with neuro-ophthalmic signs and headache

- All patients with pituitary apoplexy should undergo testing for pituitary insufficiency
-
- Neurosurgery can improve visual outcomes in Pts with pituitary macroademas and pituitary apoplexy

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CHICAGO
MEDICINE

Learning Objectives

- To discuss the differential for a sellar mass
- To review clinical manifestations & management of pituitary adenomas
- To discuss outcomes associated with neurosurgical treatment of pituitary apoplexy
- To discuss new guidelines for hormone replacement therapy in panhypopituitarism