THE UNIVERSITY OF CHICAGO MEDICINE & BIOLOGICAL SCIENCES

“62 Year Old Male with Headache”

Dr. Darji does not have any relevant financial relationships with any commercial interests.

ENDORAMA:
62 Year Old Male with Headache

Monika Darji

February 28th, 2019

Objectives

- Review the clinical presentation and workup for pituitary apoplexy
- Discuss the diagnosis and treatment of pituitary apoplexy

Chief Complaint

62 year old male presents with severe headache

HPI

- Presents with severe headache for last 3 days
  - Developed constant left ear pain 5 days ago
  - Used cocaine 3 days ago -> sudden headache
  - Constant, bifrontal, pounding, 10/10 in severity, non-radiating
  - Associated with photophobia, phonophobia, dizziness
  - Worsens with movement
  - No history of headaches

Review of Systems

- Constitutional: No fever, chills, activity change, fatigue
- HEENT: **+photophobia, left ear pain;** No visual disturbance, hearing loss, congestion, sore throat, neck pain
- Resp: No cough, shortness of breath
- CV: No CP, palpitations, LE edema.
- GI: No nausea or vomiting. No abdominal pain, d/c, or blood in stool.
- MSK: No myalgias.
- Skin: No rashes or ulcers.
- Neuro: **+headache, lightheadedness;** No seizures, syncope
- Endo: No heat/cold intolerance. No hair/skin changes noted.
- Heme: No adenopathy
- Psych: No anxiety or depression.

Additional history

- Past Medical History: hypertension, type 2 diabetes
- Past Surgical History: none
- Family History: mother has type 2 diabetes
- Social History: unemployed, 40 pack year tobacco use, drinks alcohol, occasional marijuana and cocaine use

Additional history

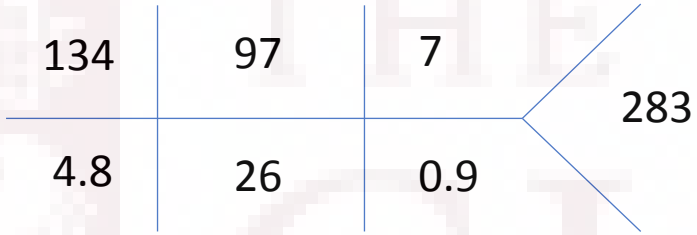
- Meds: metformin 1000mg BID, glipizide 10mg BID, losartan 100mg, vitamin D3 2000 IU daily

- Allergies: NKDA

Physical Exam

- Vitals: 86 kg, BMI 25, Temp 98.1, HR 82, RR 18, BP 194/97, SpO2 99%
- General: **Mild distress, diaphoretic**. Appears stated age.
- HEENT: Normocephalic. **No visual field defects, PERRL, EOMI**; No pharyngeal erythema.
- Neck: No neck tenderness. No thyroid nodules appreciated.
- Cardiovascular: Regular rate and rhythm. No peripheral edema.
- Pulmonary/Chest: Clear to auscultation bilaterally.
- Gastrointestinal: Soft, non-tender, non-distended. No rebound or guarding.
- Musculoskeletal: Normal bulk and tone, no joint effusions or major deformities
- Neurological: Alert & oriented, CN 2-12 intact, motor strength 5/5 in BUE and BLE
- Skin: No rashes or bruises

Labs



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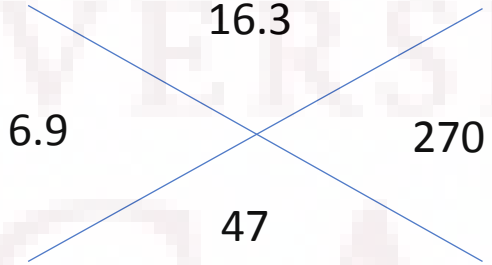
Ca 9.1

Anion gap 11



Total protein	8.4
Albumin	4.1
Total bilirubin	0.5

Alkaline phosphatase	86
ALT	14
AST	17

A1c 10.5%

Tox screen – cocaine positive and opiates

Imaging

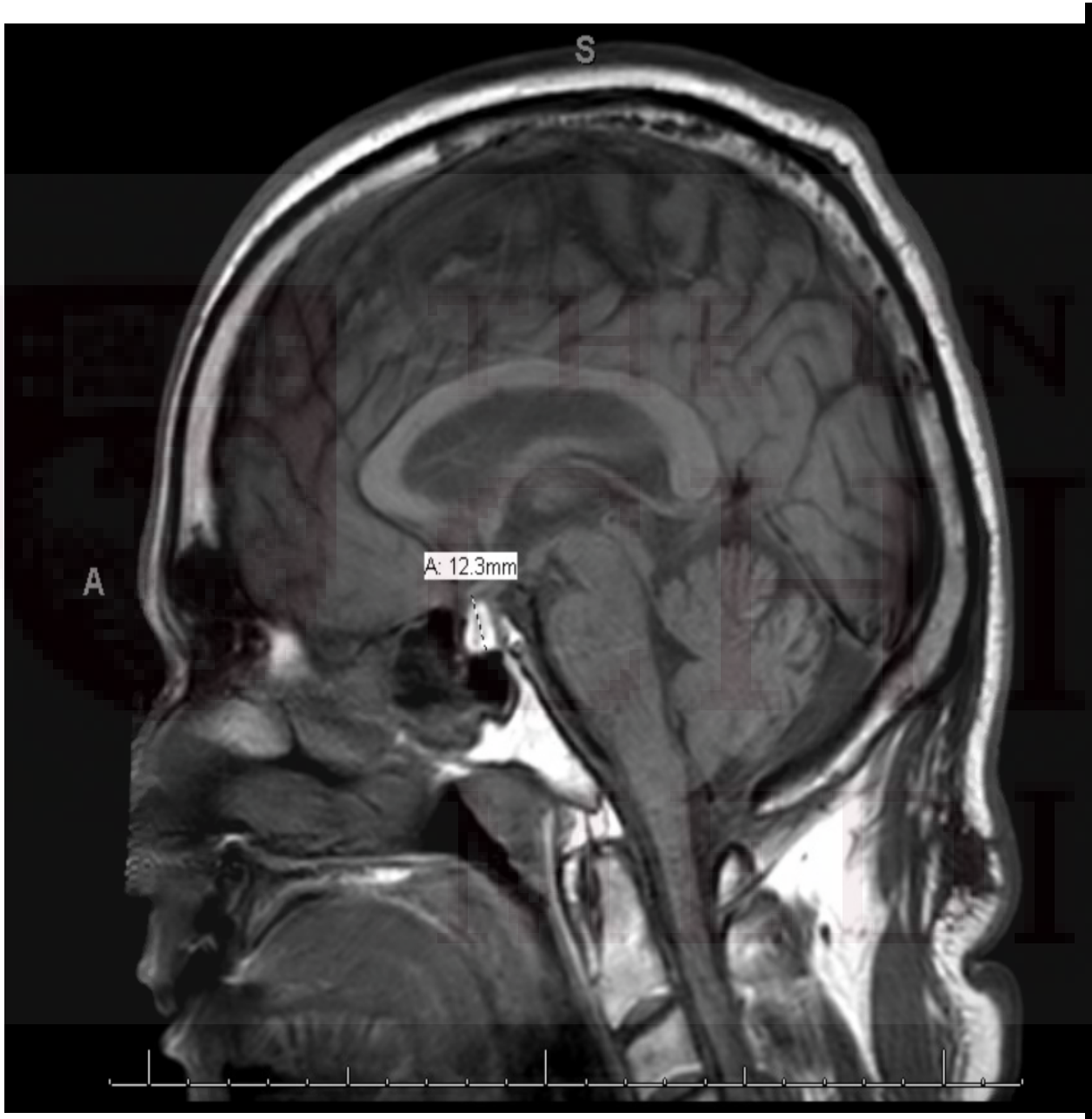
- CT head WO - No evidence of acute intracranial hemorrhage, mass-effect or edema

Hospital Course

- Concern for thunderclap headache
  - Neurology consulted, concern for subarachnoid hemorrhage
    - Further imaging obtained
  - Treated with migraine cocktail, toradol, tramadol, fioricet, tylenol 3, 100% O2 with no relief. Norco 5-325 provided minimal relief
  - Blood pressure control – goal SBP <140
    - Started on nicardipine drip

Imaging

- CT angio head W/WO contrast - pituitary mass with suprasellar extension that measures up to approximately 15 mm in height which may represent a macroadenoma. No evidence of acute intracranial hemorrhage
- MRI brain WO - pituitary is enlarged measuring up to 12 mm craniocaudal height with its parenchyma replaced by abnormal signal characteristics which includes T1 hyperintensity and T2 hypointensity, abutting the undersurface of the optic chiasm, consistent with hemorrhage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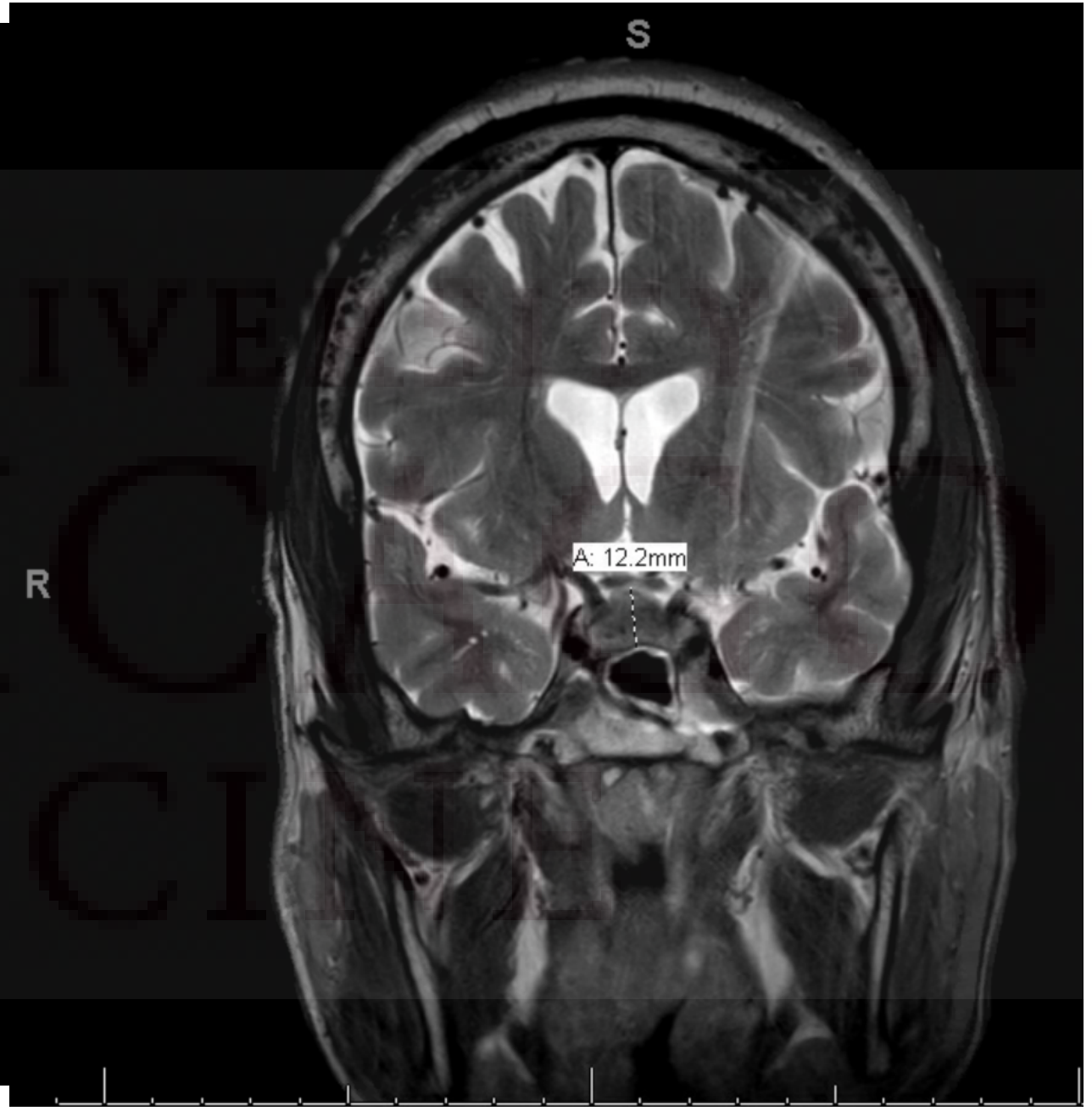
A
A: 12.3mm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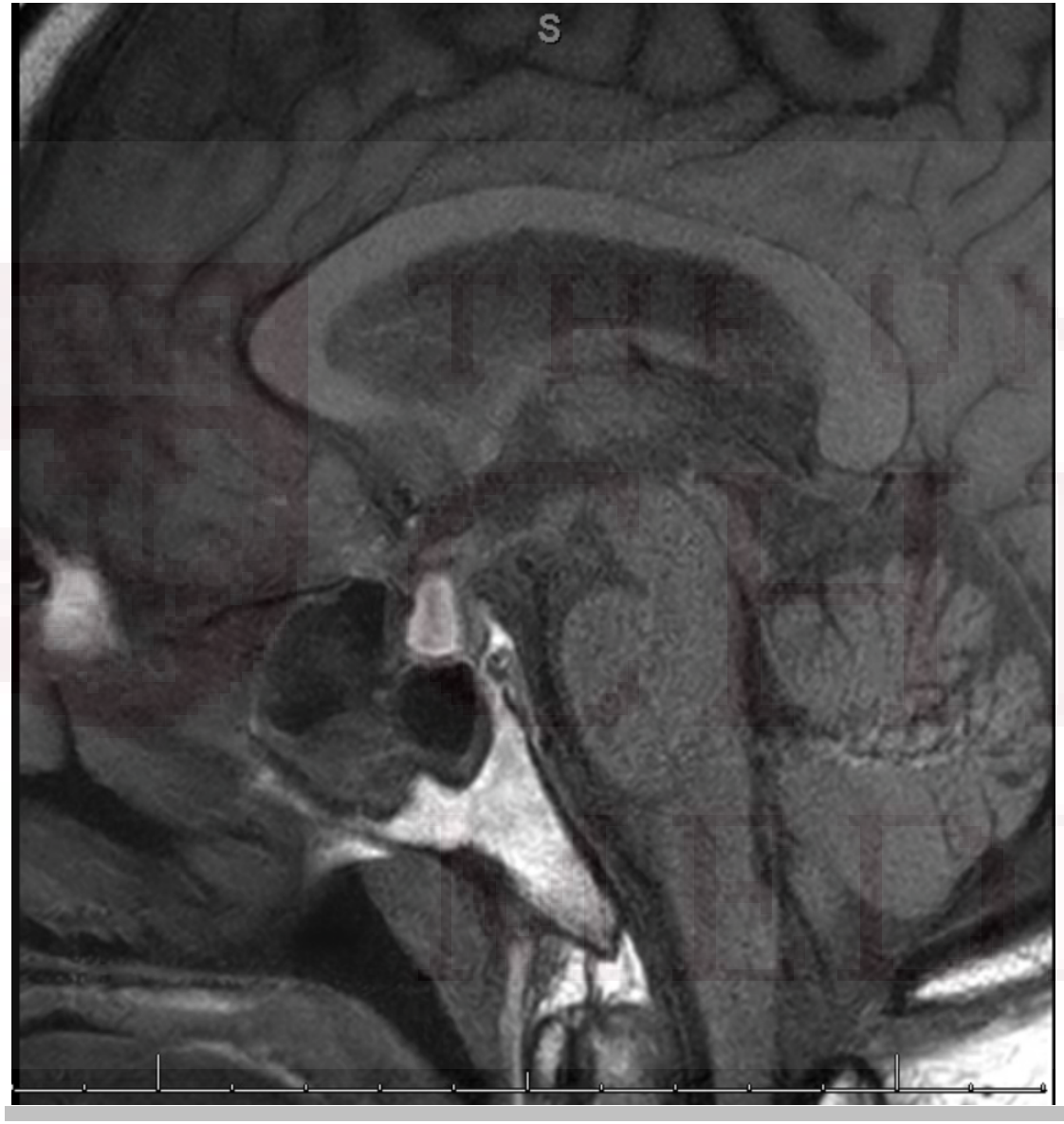
A: 12.2mm

Further workup

- ACTH 1.1 pg/mL
- Cortisol 0.7 ug/dL
- FSH 1.3 mIU/mL
- LH 1.0 mIU/mL
- Total testosterone 15 ng/dL
- Free testosterone 3 pg/mL
- TSH 0.28
- Free T4 0.72
- Prolactin 2.16 ng/mL
- IGF-1 43 ng/mL

Further workup

- MRI pituitary W/WO - Findings compatible with subacute pituitary apoplexy perhaps superimposed upon a pre-existing pituitary macroadenoma
  - Encroachment and perhaps mild superior displacement of the optic chiasm without evidence of abnormal signal within the optic tracts
  - Pituitary stalk is deviated slightly to the left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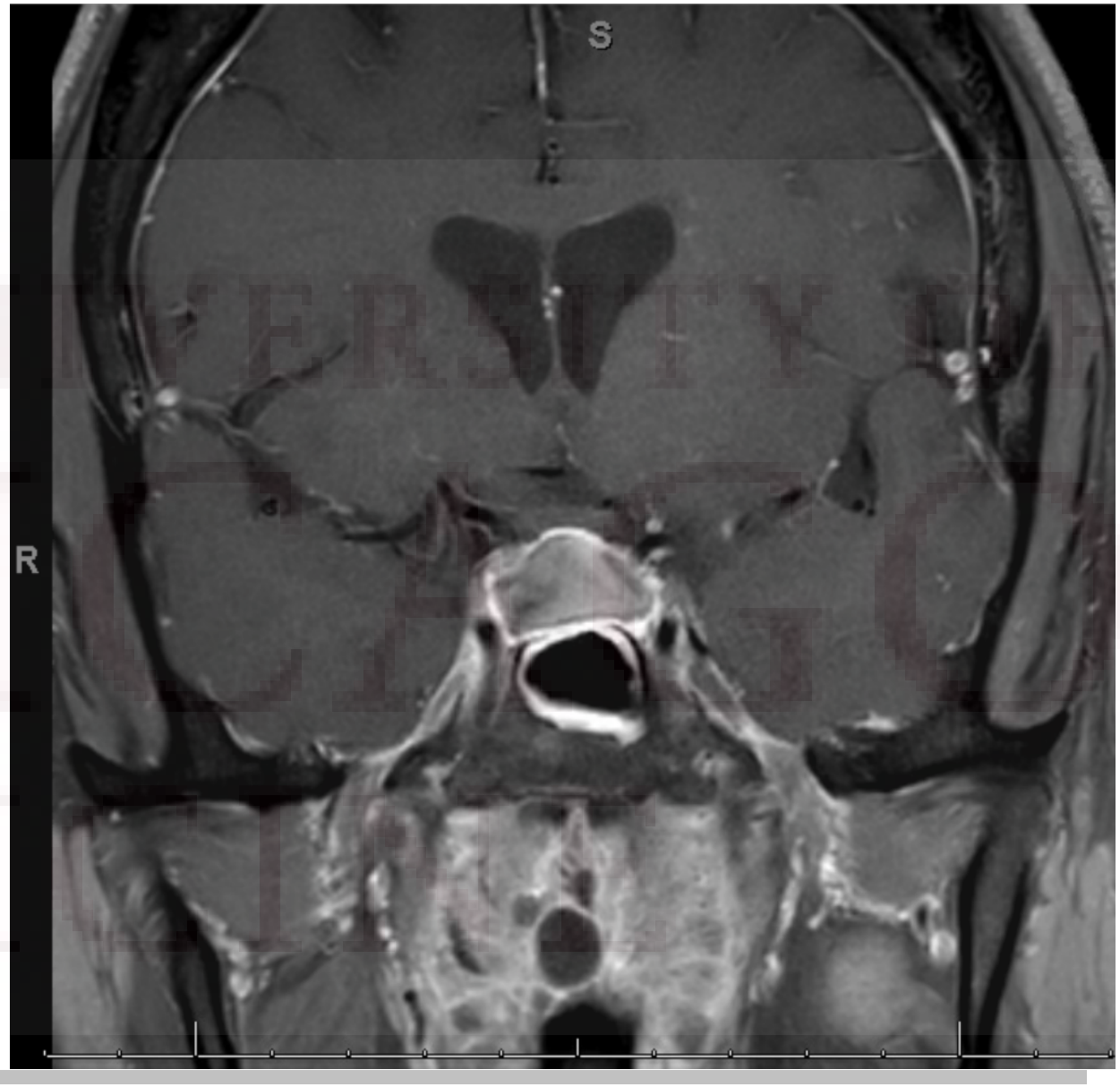
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Pituitary apoplexy

- Abrupt hemorrhage or infarction of pituitary gland
- Complicates 2%–12% of pituitary adenomas, especially nonfunctioning tumors[2]
- Occur at all ages but is most frequent in the fifth or sixth decade
- More common in males
- Subclinical pituitary apoplexy

Precipitating factors

- Identified in 10%– 40% of cases of pituitary apoplexy[2]
- Precipitating factors
  - Major surgery
  - Anticoagulant therapy
  - Dynamic testing
  - Hypertension

Risk factors	
Systemic hypertension	
Major surgery: coronary artery bypass surgery; transurethral prostatectomy; hip replacement surgery	
Coagulopathies, anticoagulation, thrombolytic and antiplatelet therapy; Dengue hemorrhagic fever	
Dynamic pituitary function tests with TRH, GnRH, Insulin and CRH (individual or combined)	
Estrogen therapy, pregnancy and post-partum state	
Medications: Dopamine receptor agonist, Isosorbide; Chlorpromazine, GnRH agonist, Clomiphene	5
Radiation therapy	
Head trauma	
Pituitary surgery	
Gamma knife therapy	

Clinical presentation

- Ranges from relatively mild symptoms to more severe symptoms
- Headache
  - Most frequent presentation of pituitary apoplexy
  - May be thunderclap headache - sudden onset of excruciating headache
  - Frequently retro-orbital
- Visual disturbance
  - Visual-field impairment such as bitemporal hemianopsia
  - Decreased visual acuity
  - Diplopia
  - Ophthalmoplegia
- Altered mental status
- Signs and symptoms of meningeal irritation
- Nausea and vomiting

Clinical presentation

Clinical feature	Percentage
Headache	90-100
Nausea/vomiting	40-80
Decreased visual acuity	45-90
Visual field defect	40-75
Opthalmoplegia	50-80
Altered consciousness	5-40
Pyrexia	10-25
Meningeal sign	5-15

Clinical presentation

- Hypopituitarism
  - May have one or more anterior pituitary deficiencies
  - Corticotropic deficiency occurring in 50%– 80% of cases[2]
    - May present with hypotension and hyponatremia
- Pituitary apoplexy can complicate a secreting pituitary adenoma
  - Most frequently prolactinoma
  - Cushing's disease
  - Acromegaly

Clinical presentation

Table 4. Percentages of Pituitary Deficiency at Time of PA Presentation in the Main Series Published Since 2000

First Author (Reference)	Year of Publication	Number of Patients	Any Pituitary Deficiency	Gonadotroph Deficiency	Thyrotroph Deficiency	Corticotroph Deficiency	Somatotroph Deficiency	Lactotroph Deficiency	Diabetes Insipidus
Sibal (13)	2004	45	76	76	57	60	NA	40	NA
Ayuk (12)	2004	33	72	72	37	50	NA	24	NA
Semple (27)	2005	62	73	40	55	61	6	2	8
Lubina (40)	2005	40	42	35	30	50	NA	NA	2
Dubuisson (29)	2007	24	71	67	67	62.5	58	58	0
Zhang (49)	2009	185	54		25	30	NA	NA	NA
Shou (45)	2009	44	NA	39	77	73	NA	NA	NA
Möller-Goede (31)	2011	42	45	43	14	7	NA	NA	2
Leyer (15)	2011	44	89	NA	NA	70	NA	NA	NA
Sarwar (42)	2013	25	13	1	9	13	NA	NA	NA
Kinoshita (38)	2014	58	NA	21	13	17	40	6	NA
Vargas (46)	2014	47	85	49	53	53	35	35	NA

Diagnosis

- Based on clinical manifestations and imaging evidence of a pituitary mass
- Imaging
  - CT scan is usually the initial imaging – can be used to rule out subarachnoid hemorrhage
  - MRI is the imaging of choice
  - Randeva et al. – retrospective analysis of patients with pituitary apoplexy
    - MRI correctly identified pituitary hemorrhage in 88% of patients but CT scanning identified hemorrhage in only 21%

Treatment

- Previously considered a neurosurgical emergency, always used to be treated surgically
- Surgical vs conservative management?
- Surgical decompression of the pituitary
  - Transsphenoidal approach
  - Performed in cases with
    - Severely reduced visual acuity
    - Severe and persistent visual field defects
    - Deteriorating level of consciousness

Table 2
Outcomes of the visual field and ocular palsy in each included study.

	Visual field				Ocular palsy			
Study	S-n	S-N	C-n	C-N	S-n	S-N	C-n	C-N
J. Abucham	NA	NA	NA	NA	NA	NA	NA	NA
J. Ayuk	4	7	6	6	5	8	7	7
B. Vaidya	7	16	3	4	9	14	6	8
A. Gruber	2	8	2	8	2	3	10	12
T. Brue	8	13	4	4	6	9	11	12
S. Jawansa	8	13	4	5	15	18	15	15

S-n, the number of cases after surgery; S-N, the number of cases before surgery; C-n, the number of cases after conservative treatment; C-N, the number of cases before conservative treatment; NA, Not available.

Table 3
Outcomes of the visual acuity and pituitary function deficiency in each included study.

	Visual acuity				Pituitary function deficiency			
Study	S-n	S-N	C-n	C-N	S-n	S-N	C-n	C-N
J. Abucham	4	4	2	2	3	14	9	14
J. Ayuk	NA	NA	NA	NA	NA	NA	NA	NA
B. Vaidya	13	14	4	4	21	26	16	18
A. Gruber	4	5	7	7	21	26	16	18
T. Brue	7	14	6	8	16	19	15	24
S. Jawansa	NA	NA	NA	NA	30	33	20	22

S-n, the number of cases after surgery; S-N, the number of cases before surgery; C-n, the number of cases after conservative treatment; C-N, the number of cases before conservative treatment; Not available.

- A significant difference was found between the surgical and conservative groups in the recovery of the visual field (OR =0.32, 95% confidence interval [CI] 0.1–0.97, P = 0.04)
- No significant difference between the surgical and conservative groups in the deficiency of pituitary function (OR = 0.74, 95% CI 0.37–1.48, P = 0.4)
- No significant difference for visual acuity (OR =0.37, 95% CI 0.08–1.66, P = 0.19)

Seo et al.

Retrospective study - 32 patients who underwent conservative management

Table 4. Clinical Outcomes of Patients Who Underwent Conservative Treatment of Pituitary Apoplexy

	At Initial Assessment (n)	At Final Assessment (n)		
		Improved	No Change	Newly Developed Disturbance
Visual disturbance				
Decrease visual acuity	6	5	1	0
Visual field defect	3	3	0	0
Diplopia	11	11	0	1
Cranial nerve III palsy	8	8	0	0
Cranial nerve IV palsy	1	1	0	0
Cranial nerve VI palsy	10	10	0	0
Hormonal deficiencies		**Normalized**	**1 or 2 Deficiencies**	**Newly Developed Deficiency**
1 or 2 deficiencies	17	8	9	3
3 deficiencies/panhypopituitarism	2	0	2	0

Seo et al.

Table 5. Reported Outcomes of Patients with Pituitary Apoplexy Who Underwent Conservative Treatment

Reference	Total Number of Patients (n)	Number of Patients Who Underwent Conservative Treatment (%)	Follow-Up Duration (Years, Median)	Visual Acuity Recovery (%)	Visual Field Recovery (%)	Cranial Nerve Deficit Recovery (%)	Pituitary Hormone Deficiency (%)
Maccagnan et al., 1995[21]	12	7 (58)	3.5	100 (2/2)	25 (1/4)	89 (8/9)	64 (9/14)
Ayuk et al., 2004[7]	33	18 (55)	3.7	NA	100 (6/6)	100 (7/7)	72/83/87*
Sibal et al., 2004[34]	45	18 (40)	4.9	100 (4/4)	100 (4/4)	100 (8/8)	85 (11/13)
Gruber et al., 2006[20]	30	20 (67)	4.4	100 (7/7)	25 (2/8)	83 (10/12)	89 (16/18)
Leyer et al., 2011[24]	43	24 (56)	1.8	80 (4/5)	100 (5/5)	100 (12/12)	71 (15/21)
Bujawansa et al., 2014[28]	55	22 (40)	7	NA	80 (4/5)	100 (15/15)	91 (20/22)
Singh et al., 2015[30]	87	18 (21)	2	100 (4/4)	100 (1/1)	100 (3/3)	56 (9/16)
Present study	32	32 (100)	4.1	83 (5/6)†	100 (3/3)†	100 (19/19)†	64 (14/22)†

NA, not available.

*Hypocortisolism/hypothyroidism/hypogonadism.

†Outcomes at maximum follow-up. Two of 18 patients died during the acute hospitalization.

Treatment

- Conservative management used in selected patients without major visual acuity or field defects and with normal consciousness
- Lack of large, prospective, randomized studies comparing the two treatments for pituitary apoplexy

Back to our patient

- Formal visual field testing revealed no deficits
- Neurosurgery consulted – no surgical intervention since patient had no visual field deficit and no ophthalmoplegia
- Headache improved with norco, Tylenol, and gabapentin
- Patient was started on hydrocortisone 20mg qAM and 10mg qPM and levothyroxine 100mcg
- Will need testosterone replacement as outpatient

Objectives

- Review the clinical presentation and workup for pituitary apoplexy
- Discuss the diagnosis and treatment of pituitary apoplexy

References

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