

THYROID STORM

FLAME LECTURE: 29

COLLINS 9.19.20

LEARNING OBJECTIVES

- ▶ Understand the etiology of Thyroid Storm
- ▶ Describe the sign and symptoms of Thyroid Storm
- ▶ Describe the differential diagnosis and related diagnostic labs and imaging
- ▶ Understand initial and subsequent management of Thyroid Storm

See also – for closely related topics

- ▶ None

EPIDEMIOLOGY

- ▶ Women 10x more likely to develop thyroid storm
- ▶ Caused by underlying thyrotoxicosis + a triggering factor such as:
 - ▶ Sepsis, surgery, iodine-containing contrast, withdrawal from antithyroid medication, MI, CVA, trauma to the thyroid, exogenous thyroid hormone overdose
- ▶ High mortality rate – 20-30% in hospital

EPIDEMIOLOGY

Thyroiditis:
Subacute
Drug-induced

Exogenous
Thyroid
Hormone

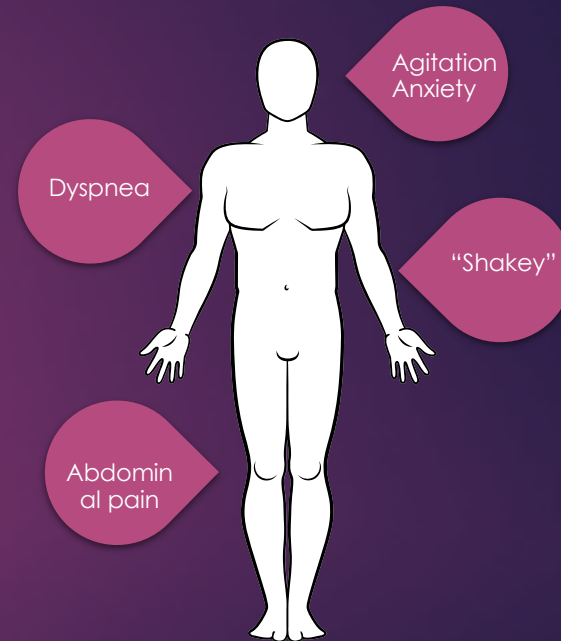
Ectopic Foci:
-Struma ovarii
-Metastatic
thyroid cancer

Hyperthyroidism:
-Graves Disease
-Elevated hCG
-TSH-secreting
pituitary adenoma
-Toxic nodular
adenoma
-Thyroid cancer

1. Adams JG Emergency Medicine 2013
2. Marx JA. Rosen's Emergency Medicine 2014

SYMPTOMS

- ▶ Altered Mental Status
 - ▶ Agitation
 - ▶ Psychosis
 - ▶ Coma
- ▶ Dyspnea
- ▶ Abdominal Pain
- ▶ Diarrhea
- ▶ Unintentional weight loss



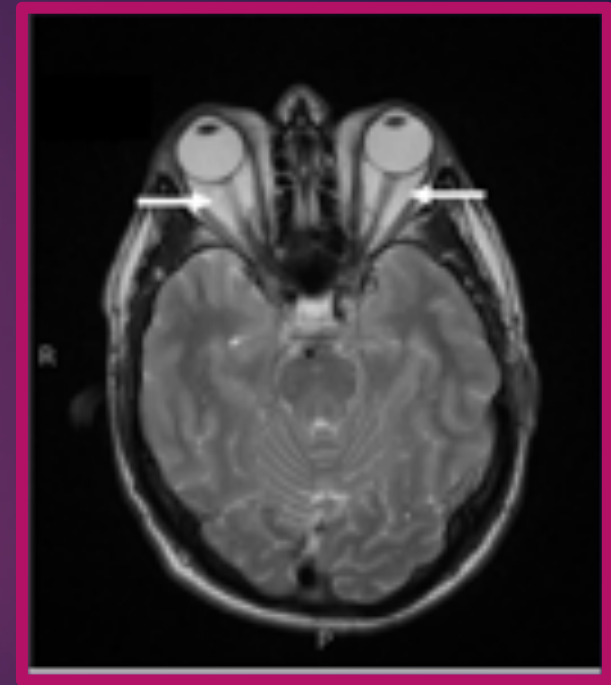
SIGNS

- ▶ High fever (104-106°F)
- ▶ Cardiac Manifestations
 - ▶ Tachycardia (often >140bpm)
 - ▶ Widened pulse pressure
 - ▶ Atrial Fibrillation
 - ▶ Hypotension
 - ▶ Signs of CHF
- ▶ Tremor
- ▶ Diaphoresis
- ▶ Jaundice

| VITAL SIGNS | |
|------------------|---|
| Heart Rate | ↑ |
| Blood Pressure | ↑ |
| Respiratory Rate | ↑ |
| SpO2 | ↔ |
| Temperature | ↑ |

PHYSICAL EXAM

- ▶ Examine eyes for signs of Graves Disease (exophthalmos, lid lag)
- ▶ Thyroid palpation looking for goiter, nodules, atrophy, tenderness
- ▶ Heart sounds
- ▶ Lung sounds – *look for other causes of dyspnea + fever*
- ▶ Extremities – *look for pitting edema, pretibial edema*



MRI showing exophthalmos
Huy A Tran and Glenn EM Reeves

1. Adams JG Emergency Medicine 2013
2. Marx JA. Rosen's Emergency Medicine 2014

Differential Diagnosis

| | |
|---------------------------------------|---|
| Sepsis | Look for source, treat empirically |
| Serotonin Syndrome | Consider medication OD, recreational drug use, and drug interactions |
| Malignant Hyperthermia | Consider if recent hx of anesthesia |
| Neuroleptic Malignant Syndrome | Consider if + psych history or access to antipsychotic meds |
| Sympathomimetic toxidrome | Consider in elderly (polypharmacy) and suicidal (intentional OD) patients |
| Pheochromocytoma | Consider if has history of transient symptoms |
| Panic Attack | Rule out all other causes first |

1. Adams JG Emergency Medicine 2013
2. Marx JA. Rosen's Emergency Medicine 2014

DIAGNOSTIC WORK UP

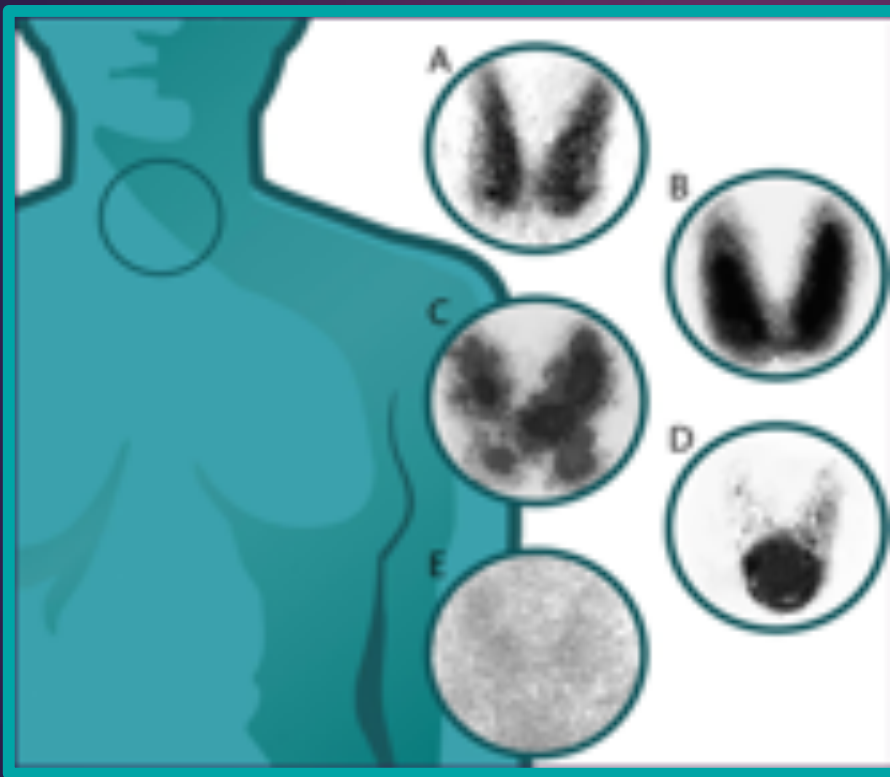
▶ LABS:

- ▶ Glucose – *hyperglycemia*
- ▶ CBC – *leukocytosis with a left shift, normocytic anemia, low cholesterol levels*
- ▶ CMP – *electrolyte disturbances (hypercalcemia), elevated LFTs*
- ▶ Blood and urine cultures – *for sepsis work up*
- ▶ UA – *for sepsis work up*
- ▶ TSH, free T4 – *Low TSH, High free T4*

▶ IMAGING:

- ▶ CXR

DIAGNOSTIC WORK UP



Thyroid Scintigraphy

- A. Normal thyroid
- B. Graves disease
- C. Toxic multinodular goiter
- D. Toxic adenoma
- E. Thyroiditis

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1. Adams JG Emergency Medicine 2013
2. Marx JA. Rosen's Emergency Medicine 2014

MANAGEMENT

- ▶ Immediate management:
 - ▶ Start **IV beta blocker** – reduces effect of catecholamines
 - ▶ Antithyroid medication (**PTU or methimazole**) oral or rectal
 - ▶ *1 hour after PTU/methimazole*, consider **Potassium iodide** (Lugol Solution)
 - ▶ Empiric **antibiotics**
 - ▶ **Steroids** – to counter possible adrenal insufficiency
 - ▶ Endocrine **consult**
 - ▶ Admit to **ICU**

SUMMARY

| Dx | Who | S/S | DDx | Work up | Management |
|----------------------|------------------------------------|--|---|--|---|
| Thyroid Storm | Women Older Hx of thyroid dz | AMS Fever Tachycardia CHF sx N/V/D Diaphoresis S/s of Graves | Sepsis Serotonin syndrome Malignant hyperthermia NMS Pheochromocytoma Panic attack | Labs: Glu, CBC, CMP, Blood and Urine culture, UA, TSH, Free T4 Imaging: CXR | IV β -blocker PTU/Methimazole 1hr later \rightarrow iodide Abx (empiric) Steroids Endocrine Consult ICU Admit |

IMPORTANT LINKS / REFERENCES

1. Adams JG. Emergency Medicine: Clinical Essentials 2013
2. Marx, JA. Rosen's Emergency Medicine: Concepts and Clinical Practice 8th Edition 2014
3. Schofer JM. Emergency Medicine: A Focused Review of the Core Curriculum
4. Icons by SlideCarnival.com