# CHAIN OF ENDOCRINE EVENTS

Alexander Shifrin, MD, Ronald Matteotti, MD, Min Zheng, MD, PhD, John Gibbs, MD

Jersey Shore University Medical Center, Neptune, NJ

- 51-year-old female
- PMHx: DM Type 2, CAD, HTN, HLP, retinopathy, neuropathy, morbid obesity (ht 5.4; wt - 282 (5 ft wide) = BMI - 48.4)
- History of hyperthyroidism two years prior
- Treated with Methimazole and went into a remission

- 12/2013 she has developed severe HTN which was complicated by a myocardial infarction
- Cardiac stents were placed, Aspirin and Effient were started

- Over the next six months she has developed:

→ Severe hypertension

→ Relapse of hyperthyroidism with severe thyrotoxicosis (9/2014) (TSH < 0.001 IU/mL, T4 - 2.64 ng/dL(< 1.60), T3-3.9, TPO Ab – 15 IU/mL(< 34), TSI – 34% (<139%) – on Methimazole 10 mg bid)

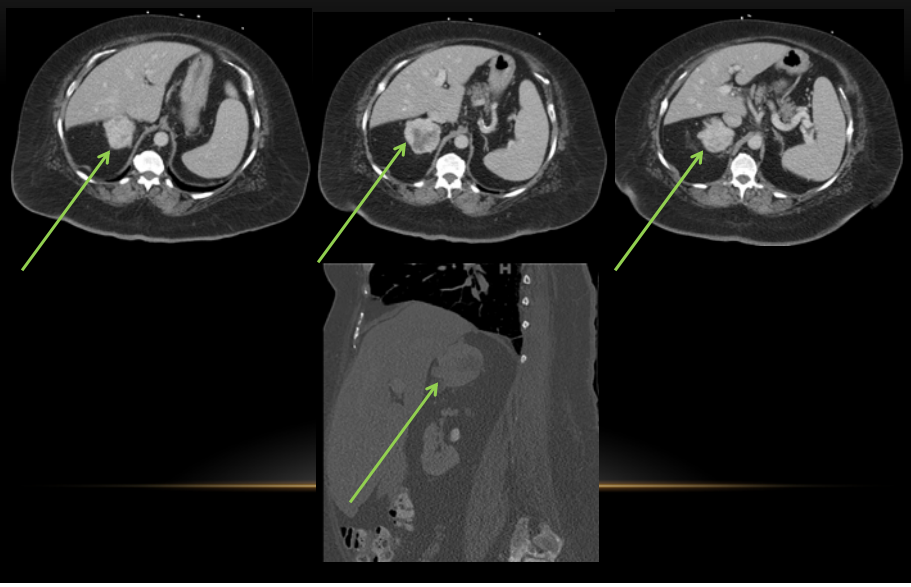
→ Worsening of blood sugar levels (Lantus, Novolog, Januvia, Metformine, Farxiga, Bydureon)

- Referred back to an endocrinologist (9/11/14)

- Methimazole was restarted.
- It was difficult to control her hyperthyroidism despite increasing Methimazole dose.

- Thyroid US showed multinodular goiter with dominant nodule 4.3 cm on the left.

- In 9/2014 she presented to ER with abdominal pain:
- CT scan revealed a 5.5 x 5.0 cm right adrenal tumor.

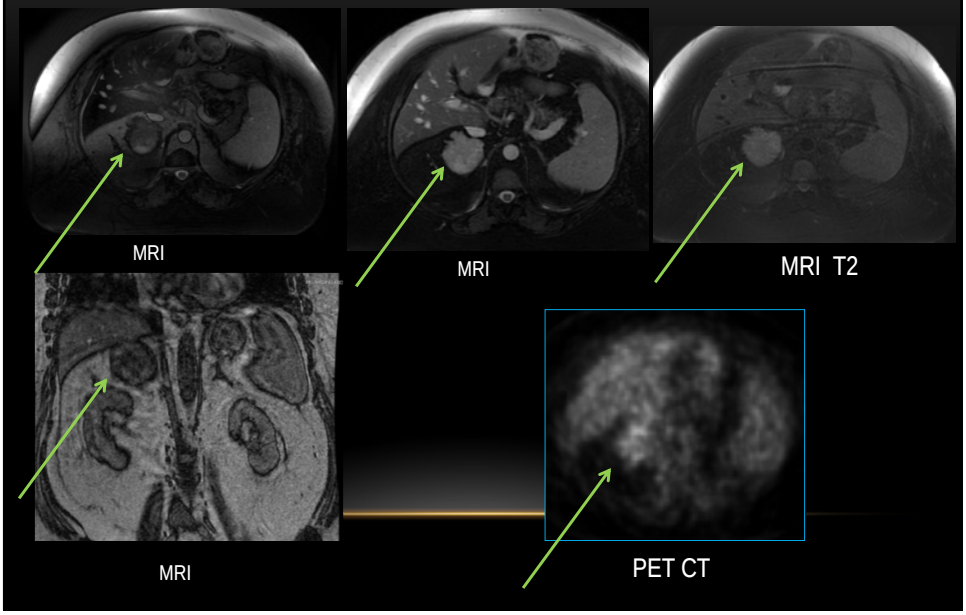


- 24hr-urine (9/14): Metanephrines - 6466 mcg/24hr (<832),
  Norepinephrine – 131 mcg/24hr (<100),
  Normetanephrine – 5960 mcg/24hr (<676)
- Plasma: Normetanephrine 1221 pg/mL (< 145)
  Metanephrine 34 pg/mL (< 62) – wnl
  Aldosterone, Renin, ACTH, DHEA – wnl
  Chromogranin A – 16 nmol/L (<5)

confirming the diagnosis of pheochromocytoma

- Normal blood Calcium, PTH, Calcitonin levels
- No family history of genetic diseases

Abdominal MRI showed irregular 5.3 x 4.8 cm right adrenal mass with necrotic center; PET CT - SUV 3.6 “c/w malignancy”.

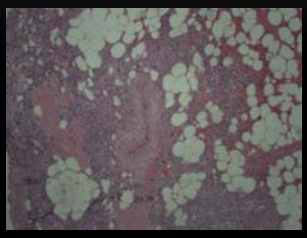



- She was treated with Prazosin but was readmitted to the hospital with severe HTN and was switched to Phenoxybenzamine
- In 4 weeks her blood pressure and hyperthyroidism were under good control
- She underwent a laparoscopic, converted to open, right adrenalectomy

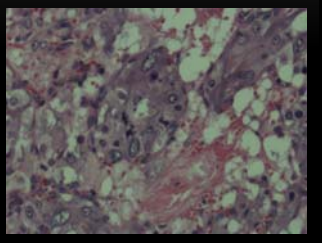
## Pathology:

A 10 cm, minimally adherent to surrounding tissues, right adrenal tumor, PASS score 10 - consistent with malignant pheochromocytoma.

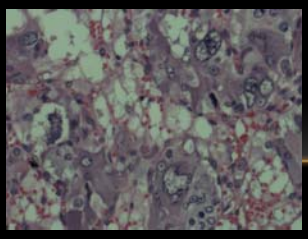
chromogranin stain positive



Invasion of periadrenal adipose tissue



nuclear pleomorphism and mitosis



nuclear pleomorphism and mitosis

- Patient successfully recovered after the surgery with significant improvement of hyperthyroidism and diabetes.
- Thyroid biopsy – benign nodule
- Genetic Testing revealed no mutations in:
  MAX, NF1, RET, SDHA, SDHAF2, SDHB, SDHD, TMEM127, and VHL

## SUMMARY:

- 51 yo morbidly obese female patient with multiple comorbidities
- History of thyrotoxicosis in remission for 2 years
- Developed sever HTN followed by an acute MI with relapse of thyrotoxicosis, and worsening of diabetes
- Found to have adrenal mass - biochemically pheochromocytoma
- Surgery / Pathology – malignant pheochromocytoma
- Thyrotoxicosis and diabetes have improved after the surgery

# DISCUSSION

# KEY TEACHING POINTS:

- Myocardial infarction could be presented as the first sign / symptom of pheochromocytoma
- MI is related to severe coronary vasospasm during pheochromocytoma crisis.
- The relapse of thyrotoxicosis secondary to excessive catecholamine secretion by pheochromocytoma has been reported in the literature.
- DM type 2 coexists in 31% patients with pheochromocytoma and improves in 90%

Endocr J. 2003 Dec;50(6):767-70; Thyroid 1992, 2;203-6.; Postgrad Med J. 1976 May; 52(607): 288–291. Indian J Endocrinol Metab. 2013 Mar;17(2):323-5.; Cent European J Urol. 2014;67(4):361-5.; Rev Esp Cardiol. 2011 Mar;64(3):244-6