ASEAN NETWORK of
ADRENAL HYPERTENSION

Bilateral Hyperaldosteronism with Unilateral Adrenalectomy with Recurrence of Patient Symptomatology

Prof. Leilani B. Mercado-Asis, MD, PhD, MPH, MEd (DE)

Faculty of Medicine and Surgery

University of Santo Tomas

Manila, Philippines

lmasis@ust.edu.ph

CASE

- 64
- Female

Chief complaint:
Generalized Weakness

1996 | **INTERIM** | **3 MONTHS PRIOR** | **2 MONTHS PRIOR** | **1 MONTH PRIOR**

- Age 37 yrs old
- (+) Generalized weakness
- Admitted at a local hospital
  - K <3 mmol/L
  - Elevated BP 160-180/90-110
  - No other member of the family with similar manifestation
  - Referred to us
    - Assessment: Primary Aldosteronism
    - **Unenhanced CT scan: Bilateral adrenal nodules, ARR>20**
    - Bilateral adrenal venous sampling: Bilateral aldosterone secretion, dominant left
      → Underwent left adrenalectomy

Hormonal Studies

	Supine	Standing
Plasma Aldosterone (ng/dL)	5.6	26
PRA (ng/mL/hr)	0.0	1.12

ARR: >20

BAVS Results (1996)

0 minute (pre stimulation)

	Aldosterone	Cortisol	A/C ratio
Right Adrenal Vein	44	23.05	1.90
Left Adrenal Vein	470	>60	7.84

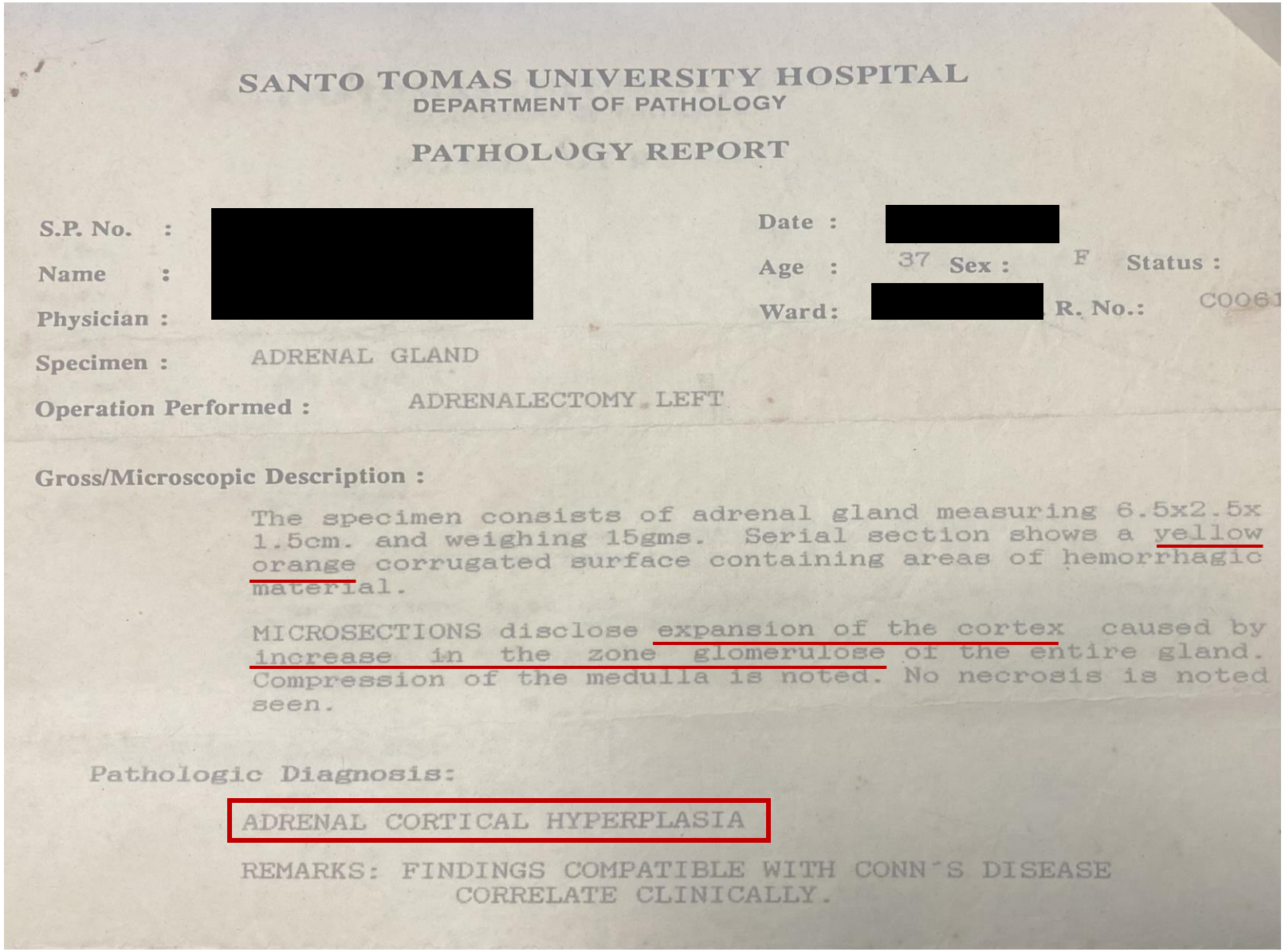
Cortisol corrected ratio: 4.13 (unilateral = left)

5 minutes (post stimulation)

	Aldosterone	Cortisol	A/C ratio
Right Adrenal Vein	68	28.21	2.41
Left Adrenal Vein	460	>60	7.67

Cortisol corrected ratio: 3.18 (indeterminate)

Pathology Report (1996)



SANTO TOMAS UNIVERSITY HOSPITAL
DEPARTMENT OF PATHOLOGY

PATHOLOGY REPORT

S.P. No. : [redacted]
Name : [redacted]
Physician :

Date : [redacted]
Age : 37 Sex : F Status :
Ward: [redacted] R. No.: C0061

Specimen : ADRENAL GLAND

Operation Performed : ADRENALECTOMY LEFT

Gross/Microscopic Description :

The specimen consists of adrenal gland measuring 6.5x2.5x 1.5cm. and weighing 15gms. Serial section shows a yellow orange corrugated surface containing areas of hemorrhagic material.

MICROSECTIONS disclose expansion of the cortex caused by increase in the zone glomerulose of the entire gland. Compression of the medulla is noted. No necrosis is noted seen.

Pathologic Diagnosis:

ADRENAL CORTICAL HYPERPLASIA

REMARKS: FINDINGS COMPATIBLE WITH CONN'S DISEASE
CORRELATE CLINICALLY.

1996 | INTERIM | 3 MONTHS PRIOR | 2 MONTHS PRIOR | 1 MONTH PRIOR

- She continued her follow-up with a **cardiologist**
- **Recurrent hypokalemia** (K levels of 3-3.5mmol/L)
  - No muscle weakness/ cramping, no headaches, no palpitations
  - BP 120-140/70-80
  - **Resumed spironolactone in 2021**
  - Medications: KCl 10meqs/tablet 1 tablet TID and Amlodipine+ Losartan 5/50mg/tablet OD

Clinical Course from the Cardiologist's Chart (1)

Date of Consult	BP	Potassium
11/4/2013	160/90	
12/7/2013	130/70	
3/24/2014	145/90	
4/7/2014	130/70	3.10
5/27/2014	160/80	
6/18/2014	160/90	
8/4/2014	130/80	
4/24/2015	120/90	3.40
5/8/2015	120/70	
6/9/2015	120/70	
11/17/2014	130/80	
12/3/2014	130/80	4.09
1/8/2015	130/80	3.96
9/3/2015	120/80	
1/29/2016	130/70	
4/2/2016	120/70	
5/27/2016	120/70	3.47
6/26/2016	140/80	
9/26/2016	120/70	4.0
11/9/2016	130/80	
12/1/2016	120/80	
1/2/2017	120/80	4.1
4/7/2017	130/80	

Clinical Course from the Cardiologist's Chart (2)

8/10/2017	150/90	
11/6/2017	130/70	3.89
12/5/2017	120/70	
5/5/2018	120/70	3.91
8/8/2018	120/80	
11/15/2018	120/70	
3/20/2019	120/80	
6/6/2019	140/90	4.10
8/23/2019	140/80	
11/16/2019	130/80	
2/12/2021	130/80	3.08
7/23/2021	130/70	
10/8/2021	160/90	
1/30/2023	130/80	3.01 – resumed Spironolactone
6/19/2023	130/80	Sept 2023 Referred back to us
5/13/2024	130/80	
4/19/2024	120/80	4.4

1996 | INTERIM | 3 MONTHS PRIOR | 2 MONTHS PRIOR | 1 MONTH PRIOR

CT SCAN OF THE WHOLE ABDOMEN (PLAIN)

- Hypodense hepatic foci may relate to cysts mild fatty infiltration of the liver
- S/p cholecystectomy
- Mild fatty involution of the pancreas
- **S/p left adrenalectomy with post-surgical changes, as described**
- Non-specific right renal parenchymal calcification
- Under distended urinary bladder with apparent wall thickening
- Atherosclerotic vascular disease
- Dorsal spondylosis
- Consider degenerative changes in the bilateral sacroiliac joints

- **(+) Recurrent generalized weakness with difficulty in ambulation**
  - With frequent ER consults
  - Laboratory work up:
    - K= 2.0- 2.5mmol/L; BP 150-160/100
      → Relieved with K correction
      → Additional anti-HTN medication: Carvedilol 12.5mg/tablet BID

1996 | INTERIM | 3 MONTHS PRIOR | Nov 2023 | 1 MONTH PRIOR

	Reference Range	Unit	Result
PAC	Upright 8-10AM ≤28 Upright 4-6PM ≤21 Supine 8-10am 3-16	ng/dL	9
PRA	0.25- 5.82	ng/mL/hr	1.80
PAC:PRA	0.9- 28.9		5.0
Cortisol	6-10AM 172- 497 4-8PM 74.1- 286	nmol/L	318
Ionized Calcium	1.10- 1.35	mmol/L	1.22
PTH	15- 65	pg/mL	48.6
Na	135-148	mmol/L	139
K	3.5- 5.3	mmol/L	3.09
Cl	98- 107	mmol/mL	
Creatinine	0.51- 0.95	meq/L	0.95
TSH	0.27- 4.20	uIU/mL	1.430

- Endocrinology consult
  - Initial Laboratory Work up
  - Meds:
    - Spironolactone 50 mg BID
    - Amlodipine 10 mg OD
    - Carvedilol 12.5 mg BID
  - K: 3.69-4.40
  - BP: 113/66 (latest)

1996 | INTERIM | 3 MONTHS PRIOR | 2 MONTHS PRIOR | Nov 2023

Saline Infusion Test Result

	Post- Infusion
Plasma Aldosterone	29.20

Positive test: Plasma aldosterone >10 ng/dL

Confirmatory test:
Saline infusion test

Final Diagnosis:
Bilateral Hyperaldosteronism with Unilateral Adrenalectomy with Reactivation of the Contralateral Adrenal