

**49 Year Old Female with
hypothyroidism presented with
headache and found to have pituitary
mass**

Endorama 01/09/2014

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HPI

- 49 year old F with PMH of hypothyroidism, and chronic headache.
- Hypothyroidism diagnosed 3 years ago
- Treated with Synthroid 100mcg/day
- Doing well until 1 year ago
 - Developed Generalized headache
 - Blurry vision, vomiting, fatigue and Wt gain (40 pounds)
 - Denied Galactorrhea, excessive sweating or change in the shoes size.
- Reported irregular menstrual cycle over the past 3 years
- 4 months ago she was seen in the urgent care clinic >>> TSH found to be very high (per patient >100). Synthroid dose increased to 112mcg daily

- Ophthalmological examinations >> normal visual acuity, normal dilated fundal examination, **Rt eye with arcuate defect and Lt eye with inferior and nasal defect**
- PCP ordered MRI Pituitary and found to have **Macro adenoma with indentation on the optic Chiasm.**
- Referred to neurosurgery service.
- Referred to us for endocrinology evaluation.

- **PMH:**

- ✓ Hypothyroidism

- ✓ Headache

- **Family History:**

- ✓ Type 2 DM in mother

- ✓ Brain tumor maternal grandfather

- **Surgical history:** Non

- **Social history**

- ✓ Quit smoking 1 month ago (was smoking 2-3cig/week).
Drink alcohol socially, no illicit drugs.

- **Home medications**

- ✓ Synthroid 112 mcg daily

- ✓ PRN Ibuprofen for headache

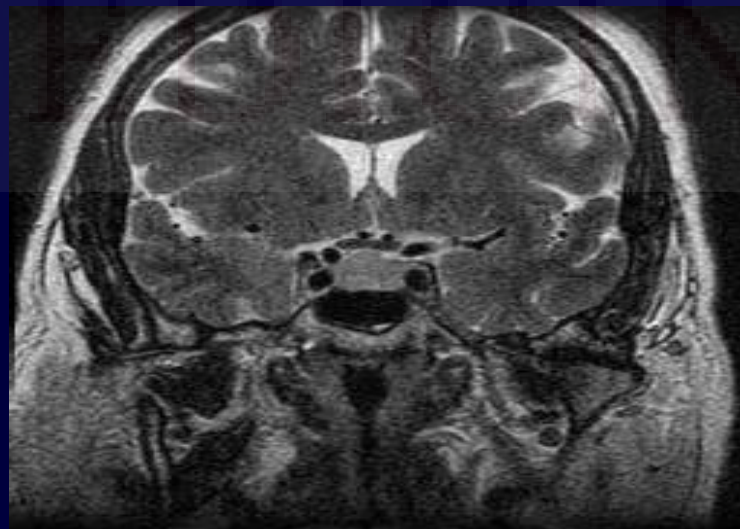
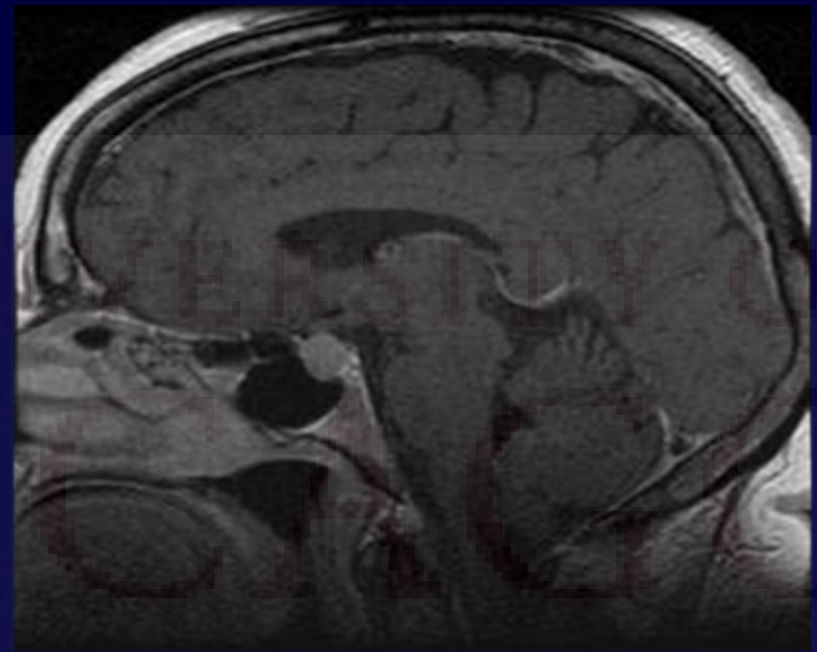
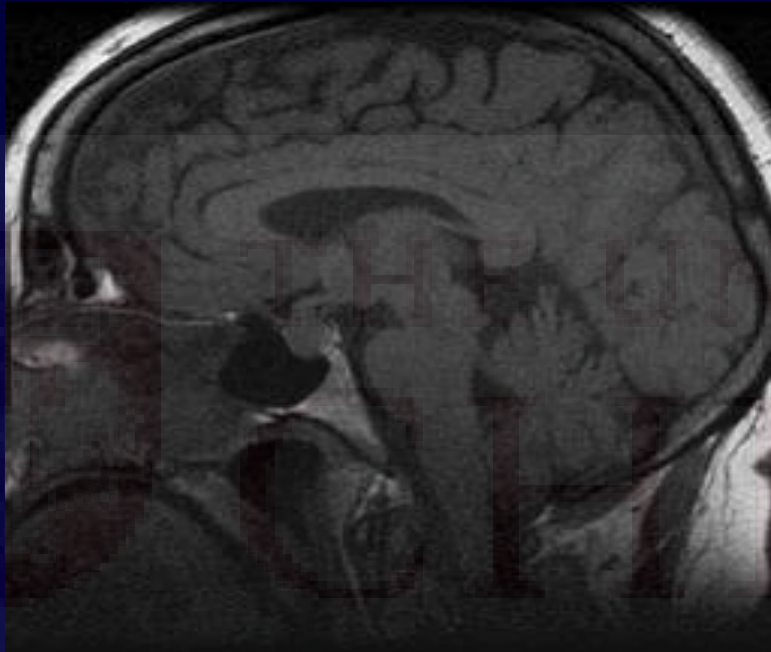
ROS

- **Constitutional:** fatigue, Wt gain
- **HENT:** Headache, blurred vision, No sore throat
- **Cardio/pulm:** No CP, no palpitation, no orthopnea or PND
- **GI:** No pain, + constipation, + vomiting with headache, no melena or hematochezia
- **GU:** Negative
- **Skin/MSK:** dry skin, no rash, increasing hair loss
- **Neuro:** headache, no weakness, no numbness, no tingling,

On Examination

- **Vitals:** BP 127/78 | Pulse 78, no fever, RR 14, Wt 145kg, BMI 52
- **General:** **Obese, cushinoid face**, awake alert, setting comfortable on exam table
- **HEENT:** normocephalic non traumatic, EOM intact, no pallor
- **Neck:** supple, no LN enlargement, no thyromegaly, **no acanthosis nigricans**
- **CVS/Pulm:** clear equal air entry no added sounds, S1 + S2, no murmur.
- **Abd:** soft lax, no organomegaly, no tenderness, audible bowel sounds.
- **Skin:** warm, no rash, **no acanthosis nigricans, light silvery striae**
- **Neuro:** CN intact, sensation normal, **bedside confrontation test normal**, normal reflexes
- **Psych:** normal mood, and affect

MRI pituitary from outside facility



General labs

Test	Result
CBC	Normal
Glucose	93
HbA1c	5.4
K	4.0
Carbon Dioxide	26
Anion gap	13
BUN	17
Cr	1.1
GFR (Calc)	53
Ca	9.4
Albumin	4.6
ALT	14
AST	43
ALP	75

Endocrine Labs

Test	Result	
ACTH	11	
Cortisol	5	
Saliva cortisol	241 (H)	Repeated 357 (H)
24hrs U cortisol	29 (N)	Repeated 14 (N)
E2	7 (L)	
FSH	41.5	
LH	15.3	
PRL	13.16	
IGF-1	80 (L)	
TSH	146.8 (H)	
FT4	0.39 (L)	
T3	55 (L)	
Alpha subunit	0.4 (ref <1.2)	

Clinical Qs

1. Frequency of pituitary hyperplasia in patients with primary hypothyroidism.
2. Is there an association of degree of pit enlargement with level of TSH?
3. Is pit enlargement shrinks with appropriate dose of T4?

Pituitary enlargement in patients with primary hypothyroidism

- *Nahla M. Khawaja, MD, Bassam M. Taher, MD, Muries E. Barham, MD, Abeer A. Naser, BSc, Azmy M. Hadidy, MD, Azmi T. Ahmad, MD, Hanan A. Hamamy, MD, Nakhleh A. Yaghi, MD, and Kamel M. Ajlouni, MD, FACP, FACE*



- Between April 2002 and August 2004, 3521 patients had thyroid function tests performed at the endocrine clinic of the National Center for Diabetes, Endocrinology and Genetics
- All patients with primary hypothyroidism and **TSH levels ≥ 50 μ IU/mL** regardless of age or sex, were included in the study.
- Patients with **post-ablative hypothyroidism or with central nervous system disorders** were excluded,

Distribution of TSH Levels among 3521 Patients Tested between April 2002 and August 2004

TSH level μ IU/mL	Patients	
	Number	%
<5	3098	88
5-10	200	5.7
10-50	163	4.6
50-100	23	0.6
>100	37	1.1
Total	3521	100

- ✓ The number of patients fulfilling the criteria of the study **was 53** (49 female and 4 male patients), with ages ranging from 10 months to 70 years.

- ✓ MRI was done to assess the size of the pituitary gland at presentation

**Sex and Age-Group Distributions of Study Patients With TSH Levels ≥ 50 ,
Stratified by Pituitary Enlargement**

Factor		Patients with pituitary enlargement	Patient with no pituitary enlargement
Sex	Total	37 (70%)	16 (30%)
	Male	3	1
	Female	34	15
Age	0-12	9	10
	12-20	7	8
	20-40	16	25
	>40	5	10

TSH	Number of pts	Enlarged pituitary	%
50 – 100	16	6	38%
>100	37	31	84%
Total	53	37	70%



After Thyroxine therapy

- MRI of the pituitary gland was repeated in **26 patients** (6-12 months after treatment).
- Normalization of the pituitary hyperplasia was evident **in 11 of the 26 patients (42%)**, a decrease in the size of the pituitary gland was evident in **5 patients (19%)**.

Review of eight previously reported patients with primary hypothyroidism and visual failure

Age	Sex	Duration Y	Pit enlargement	Visual failure	Therapy	Course	Reference
63	F	30	Yes	+	T4	Improved	Skanse and Aren
36	F	5	Yes	+	T4	Improved	Leiba et al
35	F	27	Yes	+	Operation	Not improved	Caughey and lester
59	F		Yes	+	T4 – op	Not improved	Melnyk and Greer
34	F	31	Yes	+	Radiation	Not improved	Stockigt et al
64	M		Yes	+	T4 – Op	Improved	Vagenakis et al
54	F		Ballooning	+	T4	Improved	Nagai and Nagata
55	F		Yes	+	T4	improved	Samaan et al

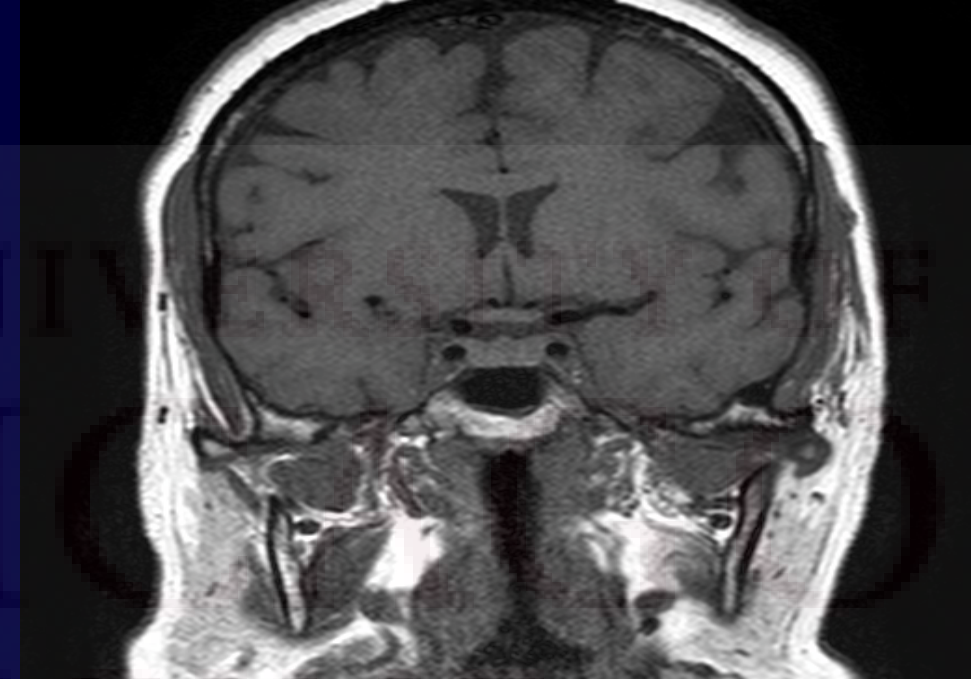
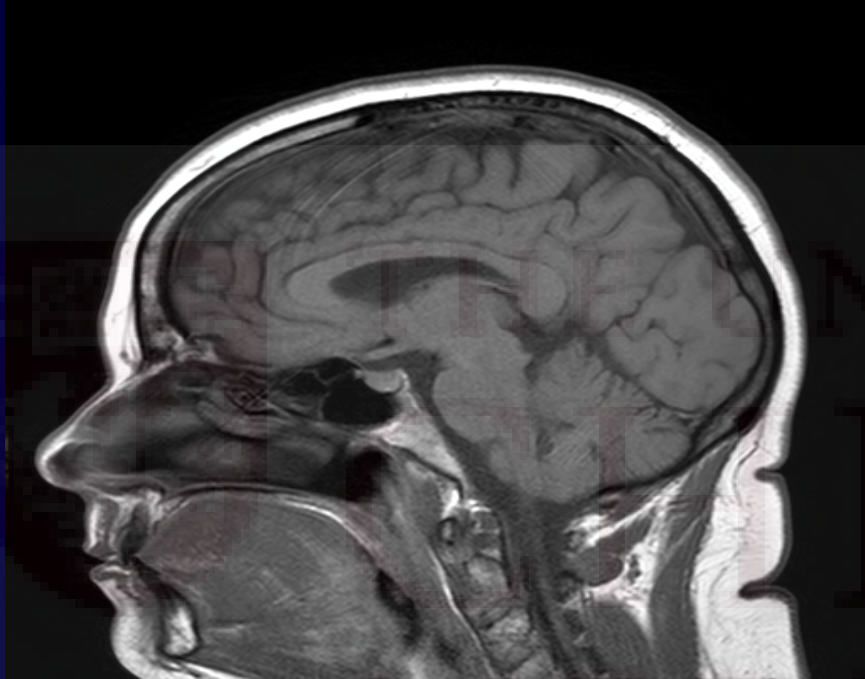
❖ There are case reports of blindness when you replace due to a paradoxical increase in thyrotrophs

Back to our patient

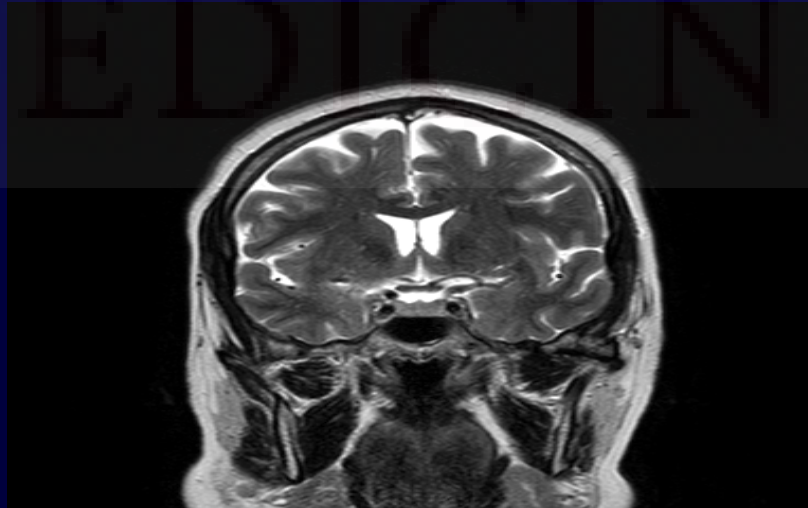
- Synthroid dose increased to 200 mcg daily.
- Repeated TFT in 8 wks showed

Test	Result
FT4	1.34
TSH	3.84
T3	118

Repeated MRI



- ❖ Unremarkable MRI of pituitary gland, no evidence of micro or macroadenoma



Take home points

- ✓ The association between pituitary gland enlargement and primary hypothyroidism should be kept in mind when pituitary hyperplasia is detected on MRI, before unwarranted and drastic interventions are initiated.
- ✓ Thyroid hormone replacement therapy led to a decrease in the size of the gland in about 60% of patients with pituitary enlargement who underwent follow-up MR examinations.
- ✓ It is appropriate to treat the primary hypothyroid patient who has pituitary enlargement + visual failure with thyroid hormone replacement therapy, with careful follow-up studies of vision.

References

- Yamada T, Tsukui T, Ikejiri K, Yukimura Y, Kotani M. Volume of sella turcica in normal subjects and in patients with primary hypothyroidism and hyperthyroidism. *J Clin Endocrinol Metab.* 1976;42:817-822.
- Shimon T, Hatabu H, Kasagi K, et al. Rapid progression of pituitary hyperplasia in humans with primary hypothyroidism: demonstration with MR imaging. *Radiology.* 1999;213:383-388.
- Takano K, Utsunomiya H, Ono H, Ohfu M, Okazaki M. Normal development of the pituitary gland: assessment with three-dimensional MR volumetry. *AJNR Am J Neuroradiol.* 1999;20:312-315.
- Desai MP, Mehta RU, Choksi CS, Colaco MP. Pituitary enlargement on magnetic resonance imaging in congenital hypothyroidism. *Arch Pediatr Adolesc Med.* 1996;150: 623-628.

Thank you



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