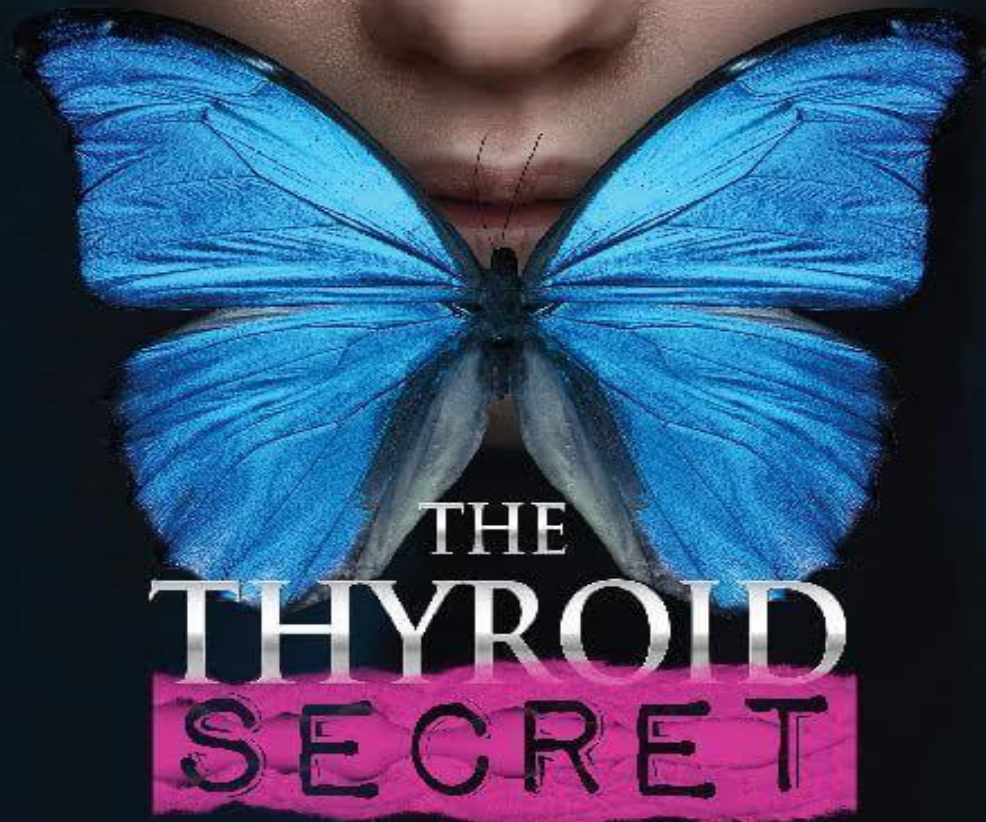


V.N. Karazin Kharkiv National University

INTERNAL MEDICINE DEPARTMENT

Speakers: students of VI
course

Orotusin Opeyemi Adeola
Oyewo Ifeoluwa Tomilayo



Scientific advisers:
assos.prof. Shevchuk M.I.,
assis. prof. Zolotarova T.V.,
assos.prof. Peresypkina T.V.
Head of department: prof.
Yabluchansky M. I.

THYROID GLAND OVERVIEW

- The thyroid is a **butterfly-shaped gland** that is located in the front of the neck just above the trachea; it weighs approximately 15 g to 20 g in the adult human
- The thyroid produces and releases into the circulation at least two potent hormones, **thyroxine (T4)** and **triiodothyronine (T3)**, that influence basal metabolic processes or enhance oxygen consumption in nearly all body tissues
- Thyroid hormones also influence linear growth; brain function, including intelligence and memory; neural development; dentition; and bone development

INTRODUCTION 1.5.

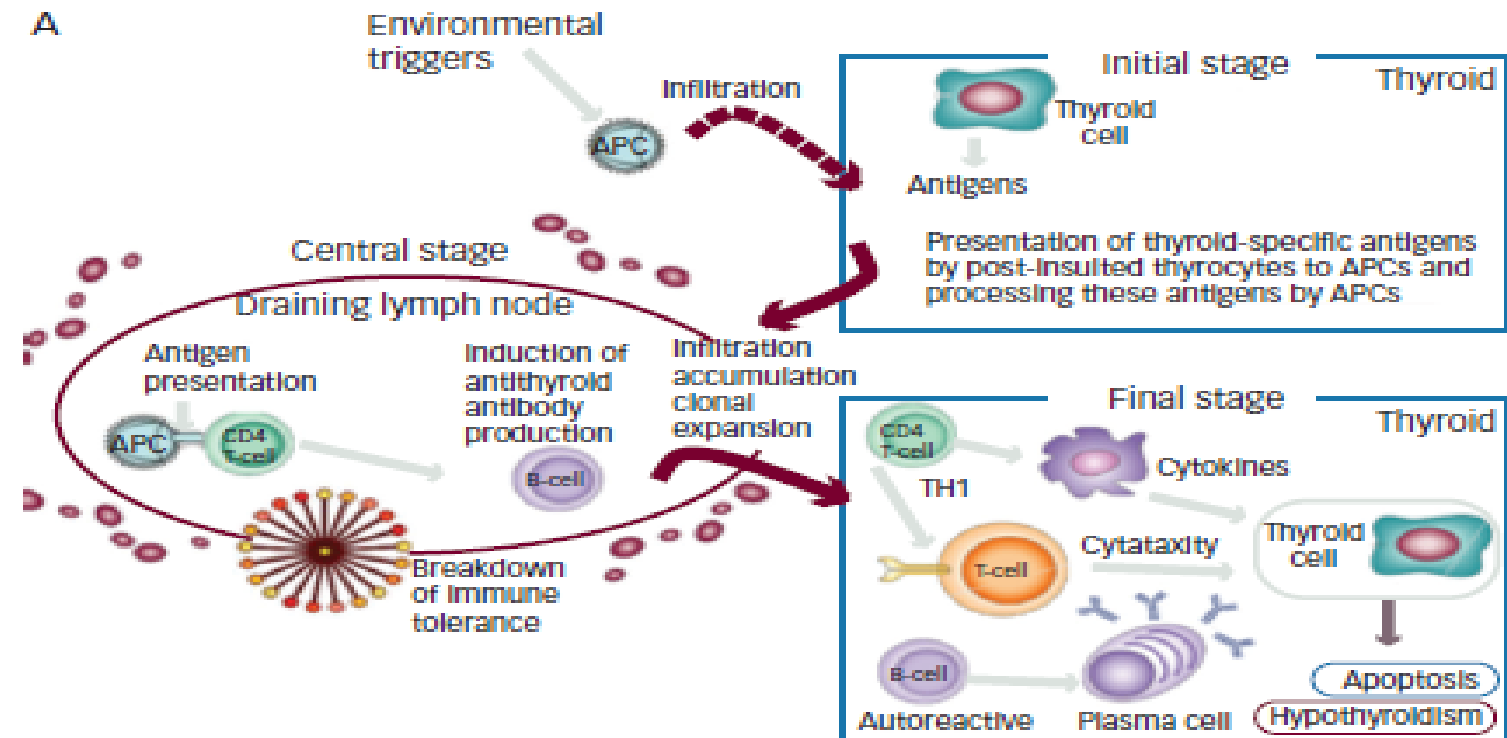
- In areas of iodine sufficiency, such as Ukraine, the most common cause of hypothyroidism is **chronic autoimmune thyroiditis (Hashimoto's thyroiditis)**
- **Autoimmune thyroid diseases (AITDs)** have been estimated to be 5-10 times more common **in women** than in men

INTRODUCTION 2.5.

- In the Whickham survey, for example, 5% of women and 1% of men had both positive antibody tests and a serum TSH value >6
- **Hashimoto's thyroiditis** increases in frequency with age , and is more common in people with other autoimmune diseases and their families
- Goiter may or may not be present
- **The symptoms of hypothyroidism are nonspecific and mimic symptoms that can be associated with variations in lifestyle, in the absence of disease, or those of many other conditions**

INTRODUCTION 3.5.

Figure 1: Schematic Representation of the Autoimmune Events in Hashimoto's Thyroiditis



APCs –antigen presenting cells

INTRODUCTION 4.5.

- One of the keys to diagnosing ATDs is determining the presence of elevated anti-thyroid antibody titers which include **anti-thyroglobulin antibodies (TgAb)**, **antimicrosomal/anti-thyroid peroxidase antibodies (TPOAb)**, and **TSH receptor antibodies (TSHRAb)**
- In patients with a diffuse, firm goiter, TPOAb should be measured to identify autoimmune thyroiditis

INTRODUCTION 5.5.

While there is no consensus about population **screening for hypothyroidism** there is compelling evidence to support case finding for hypothyroidism in:

- Those with autoimmune disease, such as type 1 diabetes
- Those with pernicious anemia
- Those with a first-degree relative with autoimmune thyroid disease
- Those with a history of neck radiation to the thyroid gland including radioactive iodine therapy for hyperthyroidism and external beam radiotherapy for head and neck malignancies
- Those with a prior history of thyroid surgery or dysfunction
- Those with an abnormal thyroid examination
- Those with psychiatric disorders
- Patients taking amiodarone or lithium

OUR PATIENT PROFILE

- 32 years old
- Female
- Book-keeper
- Town citizen
- Date of admission – 07.08.17

MAIN COMPLAINTS



ANAMNESIS OF THE DISEASE

- Listed complaints were over 5 months
- For the first time she connected it with seasonal vitamin deficiency and she had been taking **polyvitamins for a month**
- Before this present symptoms she had severe flu and infectious mononucleosis (but there is no true data except for specific changes in CBC)
- She remembered the episode of synovitis in the years 2015/2016

ANAMNESIS VITAE

- Was born into an extended family
- 1997 - viral hepatitis A (Botkin's Disease)
- Denies tuberculosis, malaria, viral hepatitis, sexually transmitted diseases and AIDS
- Denies allergic reactions to drugs
- Denies smoking
- Denies alcohol consumption
- Hereditary (Father – Asthma, IHD; mother - AH)

OBJECTIVE EXAMINATION 1.2

- The general condition is satisfactory, consciousness is clear, emotionally stable, optimistic mood
- Height = 156 cm, Weight = 56 kg, BMI = 23 kg/m
- Skin is dry
- Peripheral lymph nodes are not palpable
- Bilateral enlargement of the thyroid gland I degree, smooth, elastic structure

OBJECTIVE EXAMINATION 2.2

- Respiratory system :
  - Pulmonary percussion-resonant sound
  - Pulmonary auscultation-vesicular breathing (no adventitious sounds)
- Cardiovascular system :
  - Apex in 5th intercostal space, no enlargement of heart borders
  - HR=65 bpm
  - Auscultation revealed no abnormalities
  - BP sin=120/75mmHg, BP dextra=116/75mmHg

PRELIMINARY DIAGNOSIS

- **AUTOIMMUNE HYPOTHYROIDITIS
WITH HYPOTHYROIDISM**

RECOMMENDED EXAMINATION

- TSH , free T3, free T4, AB TPO
- Ultrasound of the thyroid gland
- Complete blood test
- General urine test
- Lipid profile
- ECG
- Biochemical blood test

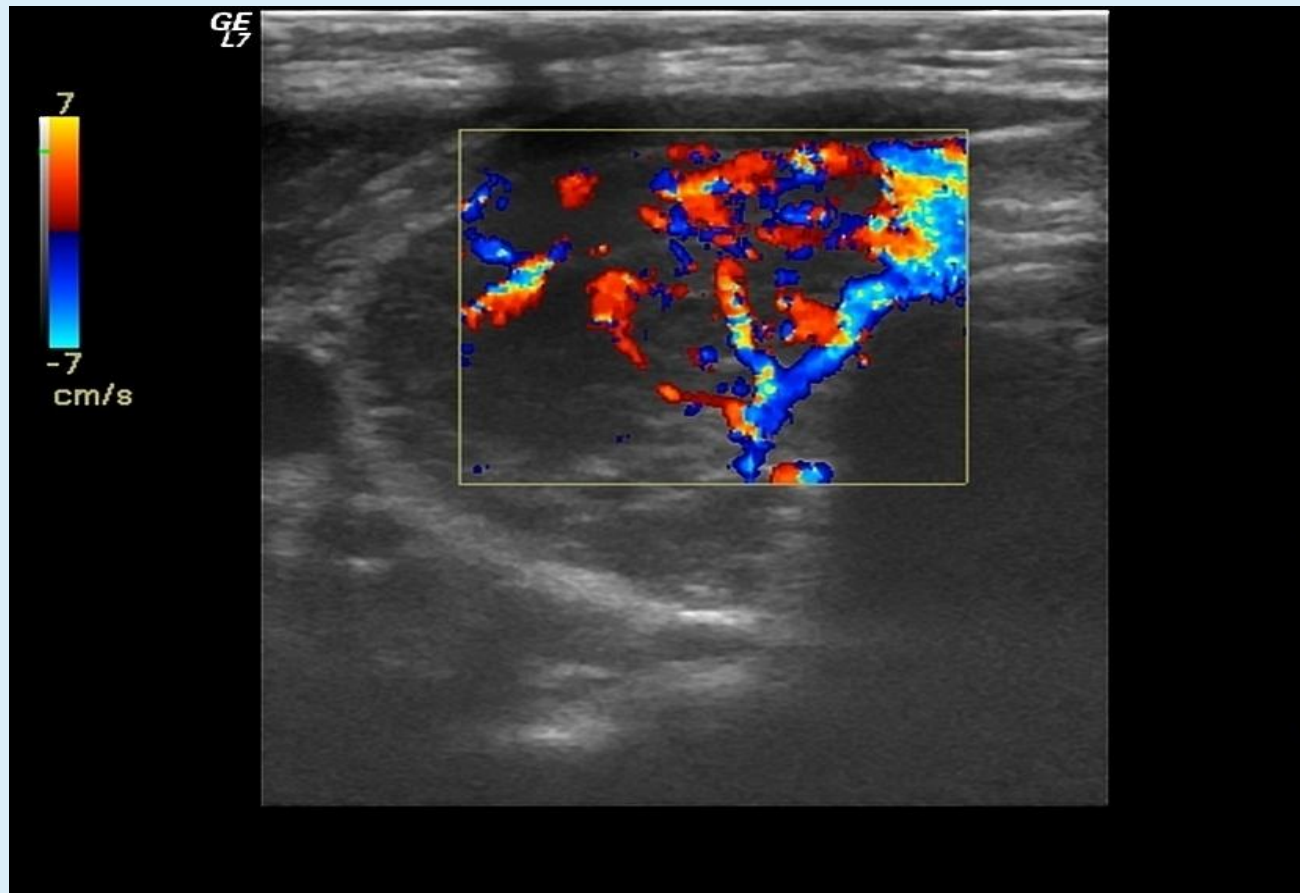
THYROID FUNCTION TEST

[08.08.17]

MEASURE	RESULT	NORMAL RANGE
Free T4	6.08	Under 60 years : 10.0-25.0 mcmol/L Over 60 years : 10.0- 21.0 mcmol/L
Free T3	2.69	2.5-5.8 mcmol/L
TSH	>20	0.23-3.40 mcmol/L
TPOAb	86.3	30.0U/mL

Conclusion: manifested hypothyroidism, elevated autoAb

ULTRASOUND OF THE THYROID



Conclusion: normal volume of both lobes, heterogeneous echotexture of thyroid (areas of hypoechoic, linear hyperechogenic of the marks), diffuse increased blood flow (looks like puff pastry or Napoleon, Spongiform appearance)

COMPLETE BLOOD TEST

[23.05.17]

RBC	4,5	4,00 – 5,00 (10 ¹² /L)	MEASURE	RESULT	RATE
Hemoglobin	133	120 – 140 (g/l)	WBC	10,29	4,0 – 9,0 (10 ⁹ /L)
HCT	39,8	35,0 – 54,0 %	Neutrophils	5, 88	1,56 – 6,13 (10 ⁹ /L)
MCV	87,1	76,0 – 96,0 (fL)	Lymphocytes	1, 94	1,19 – 3,74 (10 ⁹ /L)
MCH	29,1	27,0 – 33,0 (pg)	Monocytes	1,34	0,24 – 0,82 (10 ⁹ /L)
MCHC	33,4	32 – 36(g/dl)		13	3-10 %
RDW-CV	14,3	12,0 – 15 (%CV)	Eosinophils	1,11	0,04 – 0,36 (10 ⁹ /L)
PLT	269	180 – 360 [10 ⁹ /L]		10,8	0,5-5,0 %
PCT	0.3	(0.10 – 0.5) (%)	Basophils	0,02	0,01 – 0,08 (10 ⁹ /L)
MPV	5.7	(5.0 – 10.0) [fL]	ESR	21	≤20,0 mm h
PDW	17.3	(12.0 – 18.0) [%]			

Conclusion: leukocytosis with absolute monocytosis

COMPLETE BLOOD TEST

[09.08.17]

RBC	4,5	4,00 – 5,00 (10 ¹² /L)
Hemoglobin	126	130 – 160 (g/l)
HCT	44,2	40,0 – 48,0 %
MCV	89,8	80,0 – 100,0 (fL)
MCH	31,1	28,0 – 36,0 (pg)
MCHC	346	310 – 370 (g/l)
RDW-CV	13,6	10,0 – 16,5 (%CV)
PLT	296	180 – 320 [10 ⁹ /L]
PCT	0.17	(0.10 – 0.5) (%)
MPV	11	(6.0 – 13.0) [fL]
PDW	12.8	(10.0 – 20.0) [%]

MEASURE	RESULT	RATE
WBC	7,0	4,0 - 9,0 (10 ⁹ /L)
Neutrophils	4,0	1,7 – 7,7
Lymphocytes	2,8	0,4 – 4,4
Monocytes	0,5	0,0 – 0,8
Eosinophils	0,3	0,0 – 0,6
Basophils	0,1	0,0 – 0,2

Conclusion: normal

GENERAL URINE TEST

[09.08.17]

MEASURE	RESULT	NORMAL RANGE
SPECIFIC GRAVITY	1,024	1,001-1,040
REACTION	6,0	5,0-7,0
PROTEIN	absent	to 0.033 g / l
GLUCOSE	absent	Absent
LEUCOCYTES	2-3	6-8
EPITHELIUM TRANSITION	Not detected	Not detected
BACTERIA	Not detected	Not detected

Conclusion: normal

BIOCHEMICAL BLOOD TEST

(09.08.17)

MEASURE	RESULT	NORMAL RANGE
AsAt	16	<37 u/L
AlAt	18	<41 u/L
Total bilirubin	10	8,6-25,5 mcmol/L
Fasting glucose	5.57	4,2-6,1 mmol/l
Creatinine	80	80-115 mcmol/L

Conclusion: normal

**CLINICAL DIAGNOSIS OF
THYROID DISEASE
ACCORDING TO CURRENT
CLASSIFICATION**

ABRIDGED CLASSIFICATION OF THYROID DISEASES 1.3

- I. Diseases characterized by (tissue) euthyroidism
- II. Diseases characterized by (tissue) hyperthyroidism
- III. Diseases characterized by (tissue) hypothyroidism
- IV. Thyroid-associated ophthalmopathy
- V. Abnormal thyroid parameters without thyroid diseases (nonthyroidal illness, deficit of TBG, *etc.*)

ABRIDGED CLASSIFICATION OF THYROID DISEASES 2.3

A. With thyroid gland hypofunction

1. Primary hypothyroidism

a. Adult (iatrogenic (surgery, I therapy, external radiotherapy), chronic autoimmune thyroiditis (in the hypothyroid phase), Graves' disease (end-stage), diffuse and nodular goiter, iodine deficiency)

b. Neonatal congenital (ectopia, agenesis, dyshormonogenesis)

ABRIDGED CLASSIFICATION OF THYROID DISEASES 3.3

2. Secondary: hypothalamic-pituitary
hypothyroidism (or central)

3. Dyshormonogenetic congenital goiter

B. Without hypothyroidism

1. Generalized and peripheral resistance to
thyroid hormones (receptor and
postreceptor defects)

C. Transient hypothyroidism

MAIN DIAGNOSIS

- **PRIMARY HYPOTHYROIDISM:
AUTOIMMUNE HYPOTHYROIDITIS
(HASHIMOTO'S), MANIFESTED
STAGE**

TREATMENT

- Lifestyle modification
- Dietary supplements
- Hormone replacement therapy

LIFE STYLE MODIFICATION

- **Stress Management** (too much stress can cause receptor cells to resist thyroid hormone and weaken immune system)
- **Exercise:** stick with low-impact aerobic exercise such as walking, riding a stationary bike or yoga

DIETARY SUPPLEMENTS 1.3.

- The majority of dietary supplements (DS) fail to meet a level of scientific substantiation deemed necessary for the treatment of disease
- DS are generally thought of as various vitamins, minerals, and other “natural” substances, such as proteins, herbs, and botanicals

DIETARY SUPPLEMENTS 2.3.

- **Selenium (Se)** is an essential dietary mineral that is part of various selenoenzymes
- The thyroid is the organ with the highest **Se** content per gram of tissue
- **Se** has been investigated as a modulator of autoimmune thyroid disease and thyroid hormone economy
- **Se** is present in soil and enters the food chain through plants; foods rich in Se are Brazil nuts, oysters, tuna, whole-wheat bread, sunower seeds, most kinds of meat (pork, beef, lamb, turkey, mushrooms and rye)

DIETARY SUPPLEMENTS 3.3.

- The current recommended dietary intake of Se in adults is between 55 and 75g per day
- **Se** administration (as 200 µg/d selenomethionine) was associated with a reduction in autoimmune thyroid disease, postpartum thyroiditis, and hypothyroidism
- **Se** supplementation was associated with decreased anti-TPO titers and improved well-being or mood, but there were no significant changes in thyroid gland ultrasonographic morphology or L-thyroxine dosing

HORMONE REPLACEMENT THERAPY

- L-thyroxine monotherapy has become the mainstay of treating hypothyroidism, replacing desiccated thyroid and other forms of L-thyroxine and L-triiodothyronine
- L-thyroxine doses on the basis of the initial serum TSH values as follows:
  - 25 µg for TSH 4.0-8.0 mIU/L,
  - 50 µg for TSH 8-12 mIU/L,
  - 75 µg for TSH >12 mIU/L.
- Instructing patients to consistently take it with water between 30 and 60 minutes prior to eating breakfast

ADJUSTMENT DOSE FOR HYPOTHYROIDISM

- Dose adjustments are guided by serum TSH determinations 4-8 weeks following initiation of therapy, dosage adjustments, or change in the L-thyroxine preparation
- While TSH levels may decline within a month of initiating therapy with doses of L-thyroxine such as 50 or 75 μg , making adjustments with smaller doses may require 8 weeks or longer before TSH levels begin to plateau

TREATMENT OF OUR PATIENT

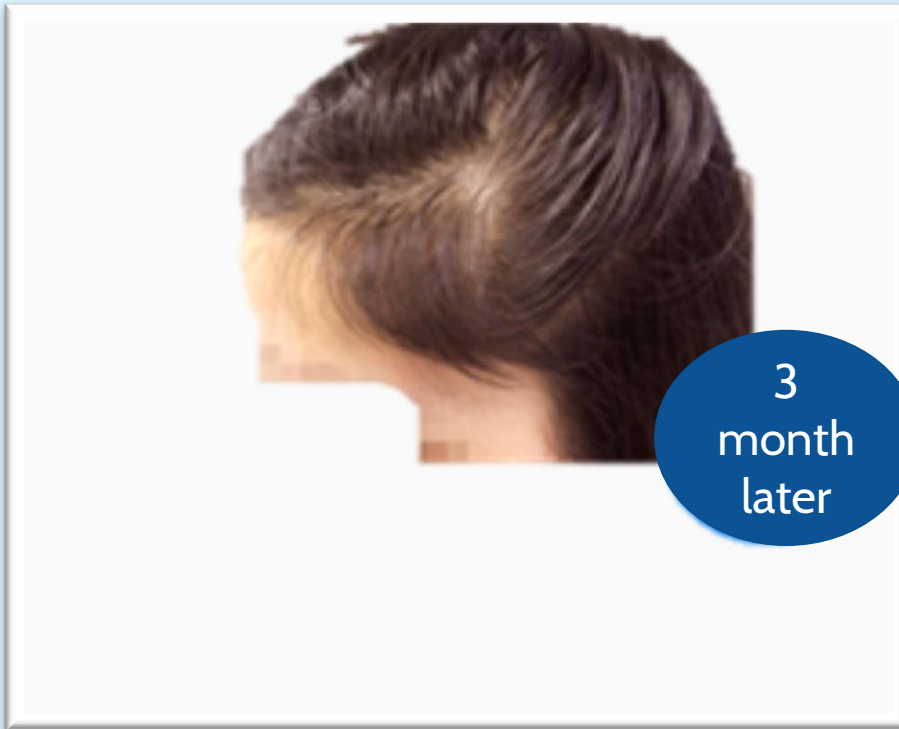
- **L- thyroxine** – 75 mg per day during 3 months then tests were rechecked
- **Se** - 200 µg everyday for 3 months (now the patient has stopped it)



**3 MONTHS AFTER
TREATMENT**

MAIN COMPLAINTS

- The hair loss has stopped and start grow back, skin is normal, denies memory problems, feels more active every day



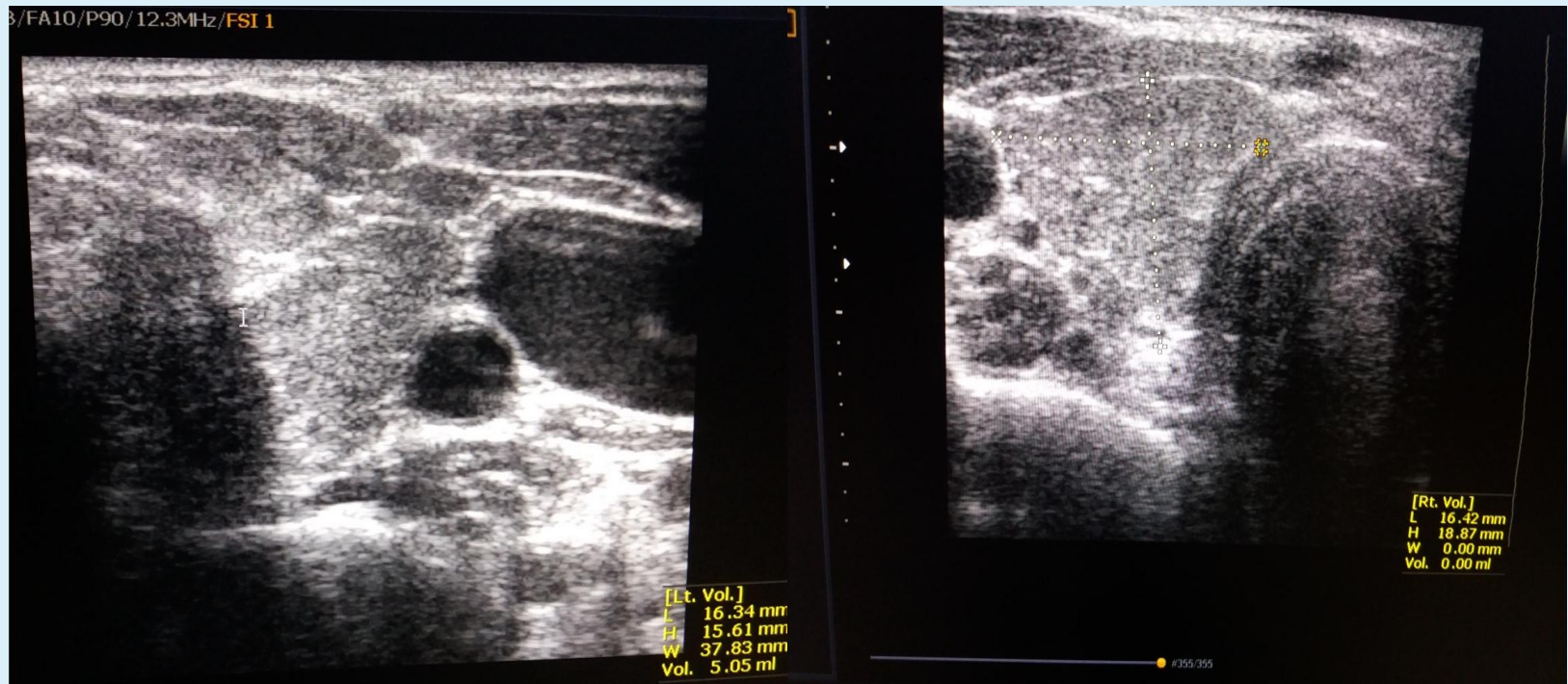
THYROID FUNCTION TEST

(06.11.17)

MEASURE	RESULT	NORMAL RANGE
Free T4	19.91	Under 60 years : 10.0-25.0 mcmol/L Over 60 years : 10.0- 21.0 mcmol/L
TSH	0.15	0.23 - 3.40 mcU/mL

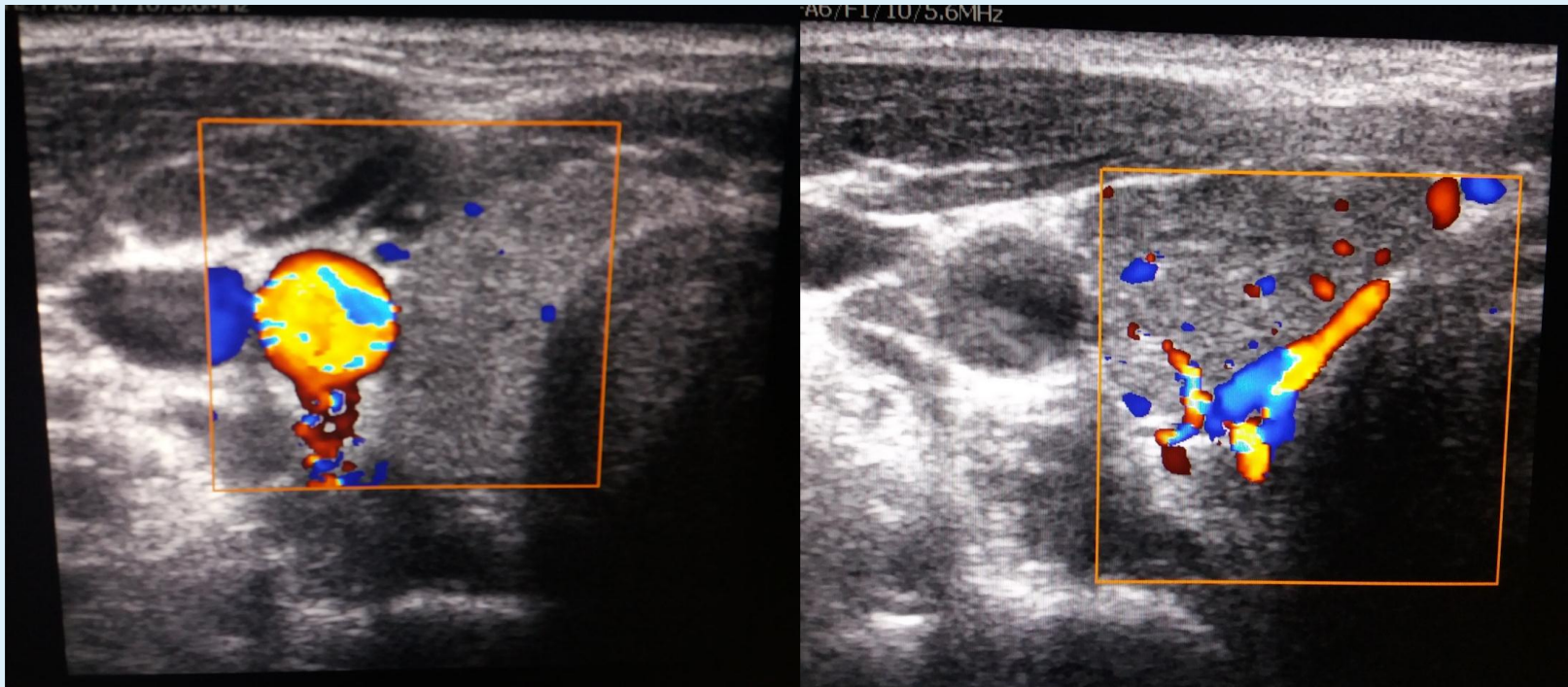
Conclusion: mild subclinical hyperthyroidism

ULTRASOUND 3 MONTHS AFTER TREATMENT 1.2.



Looks like puff pastry or Napoleon, Spongiform appearance

ULTRASOUND 3 MONTHS AFTER TREATMENT 2.2.



Conclusion: normal volume of both lobes, sites of different echogenicity (areas of hypoechoic, linear hyperechoic of the marks), diffuse increased blood flow

TREATMENT OF OUR PATIENT 3 MONTH AFTER

- **L-thyroxine** – 50 mg per day under control of TSH and T4 every 3 month

CONCLUSION

- The most reliable therapeutic endpoint for the treatment of primary hypothyroidism is the serum TSH value
- Confirmatory total T4, free T4, and free T3 levels do not have sufficient specificity to serve as therapeutic endpoints by themselves, nor do clinical criteria
- Moreover, when serum TSH is within the normal range, free T4 will also be in the normal range
- Considering the asymptomatic course of hypothyroidism, more careful monitoring of the course of the disease in dynamics is necessary

Thank you

