Thyrotoxicosis in an 18 year old with elevated β-hCG

Matt Ettleson, M.D.*

Endorama

May 21, 2020

M170

AT THE FOREFRONT
UChicago Medicine

*I have no conflicts of interest to disclose.

Learning Objectives

- Building a differential diagnosis for thyrotoxicosis in pregnancy
- Review evaluation of thyroid function in pregnancy
- A special case of thyrotoxicosis in pregnancy: TSH receptor mutation
- Treatment options and follow up
- Management of ectopic thyroid

An 18 year old female presents with nausea, vomiting, weakness, palpitations, and weight loss for several weeks. She has not tolerated food for several days. Last menstrual period was 3 months ago.

weight loss: 20kg
significant weakness, trouble walking
no personal history of thyroid disease or neck pain
no known family history of hyperemesis or thyroid disease
no prior pregnancies

Initial evaluation

April, 2020

Vitals

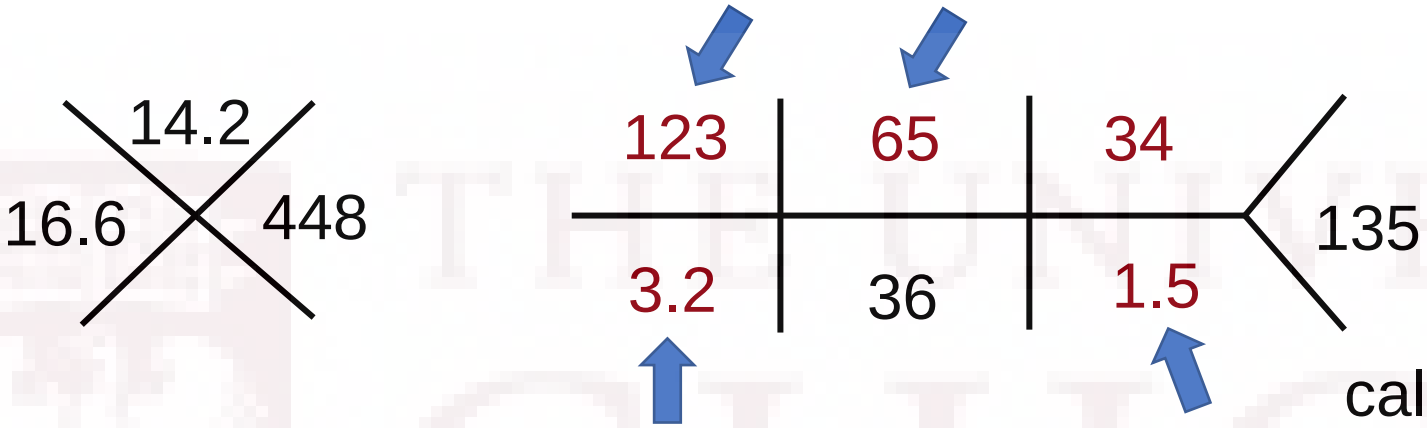
Temp: 36.6
Pulse: **137**
BP: 129/87
Weight: 56.7 kg
Height: 177.8 cm
(BMI 17.9)

Physical Exam

General: fatigued, appears unwell
HEENT/Neck: no obvious proptosis, no conjunctival injection, non-enlarged thyroid, no bruit.
Cardiac: tachycardic
Pulmonary: clear to auscultation bilaterally
Abdomen: diffuse mild tenderness, no rebound
Skin: Warm and dry
MSK: 1+ pitting edema in lower extremities bilaterally
Neuro: DTRs 2+ throughout. Alert and oriented. No tremor. Generally appears weak. Has trouble lifting arms for tremor assessment.
Mood: Slightly tangential but oriented. Does not always answer questions directly.

Initial evaluation

April, 2020



calcium 11.8

total protein 9.1
albumin 5.0
total bilirubin 4.5
alk phos 115
AST 1005
ALT 2232

INR 1.2
Lipase 71

β – hCG: 273,846 miu/mL

TSH 0.02
Free T3: 938
Free T4: 6.19

Problems:

1. Hyponatremia
2. Hypokalemia
3. Acute kidney injury
4. Acute liver injury
5. Elevated thyroid hormone
6. (pregnancy)

COVID 19: (-) multiple

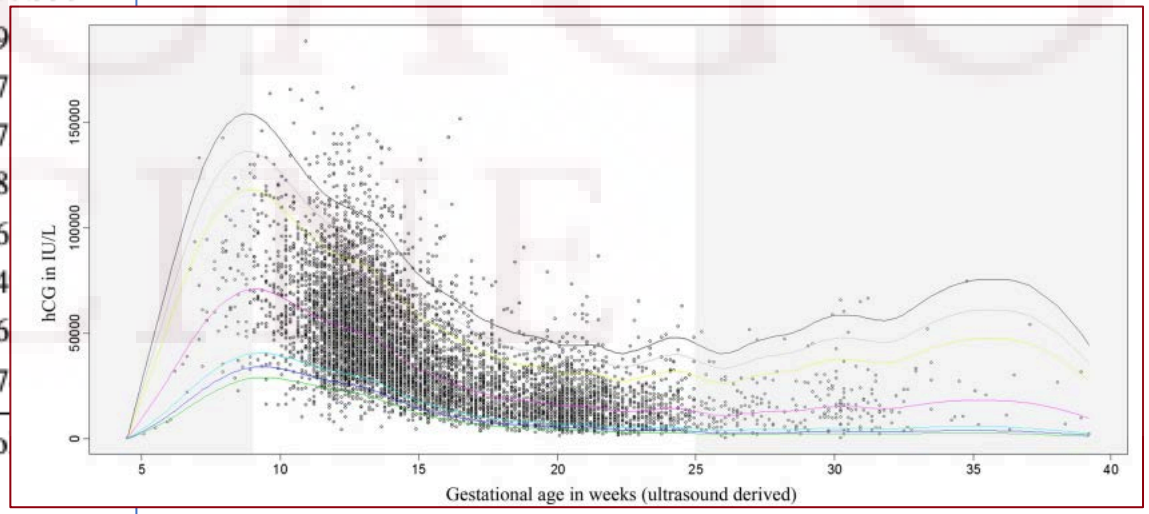
Gestational week	N	Median	Minimum	2.5th	97.5th	Maximum
<9	32	59.973	455	2.305	94.251	142.584
9	50	75.494	22.655	24.310	125.882	129.909
10	106	74.655	16.080	24.370	137.697	163.393
11	255	62.493	10.340	23.669	129.242	187.852
12	790	56.004	8.105	22.846	114.774	164.125
13	1.418	52.367	4.618	23.272	109.990	166.478
14	1.069	47.267	5.925	20.494	105.369	144.054
15	800	37.303	4.834	14.262	82.506	122.037
16	594	29.614	7.512	11.159	80.656	132.084
17	455	24.426	5.637	8.294	69.447	151.558
18	354	20.693	3.822	6.637	50.109	75.993
19	271	17.609	3.895	5.022	52.640	9
20	389	17.354	3.128	5.342	43.692	7
21	530	15.088	1.542	4.213	42.892	7
22	330	16.174	2.559	3.689	44.548	8
23	165	12.415	1.957	2.390	43.379	6
24	134	13.739	2.511	4.067	45.031	4
25	79	14.749	3.354	3.847	53.383	6
>25	244	13.852	518	2.228	58.125	7

hCG reference range values were calculated according to a population-based approach in the who population, after exclusion of women with IVF treatment (N = 38), twin pregnancy (N = 90) pregnancies (N = 2)

Hyperplastic trophoblastic cells in molar pregnancy produce excess hCG, with serum levels often >100,000 miu/mL. Partial molar pregnancies present with lower levels.

Average hCG levels at diagnosis in ectopic pregnancy are around 1000 miu/mL.

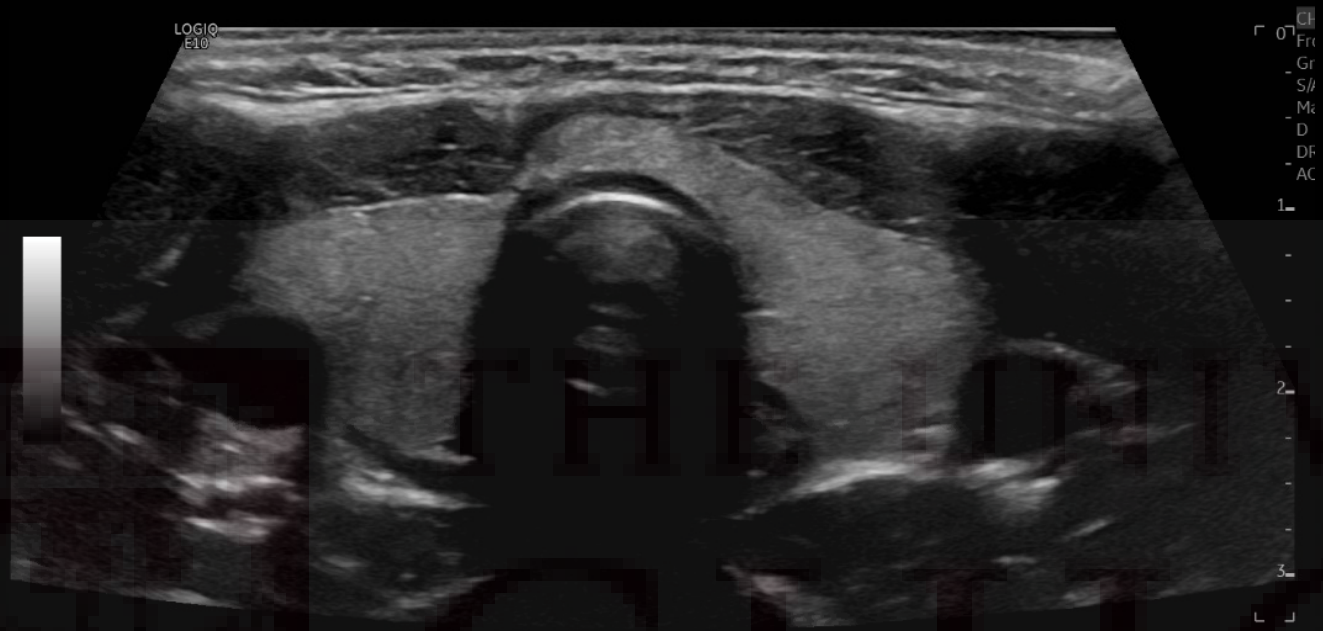
High hCG levels are seen in multiple pregnancies.



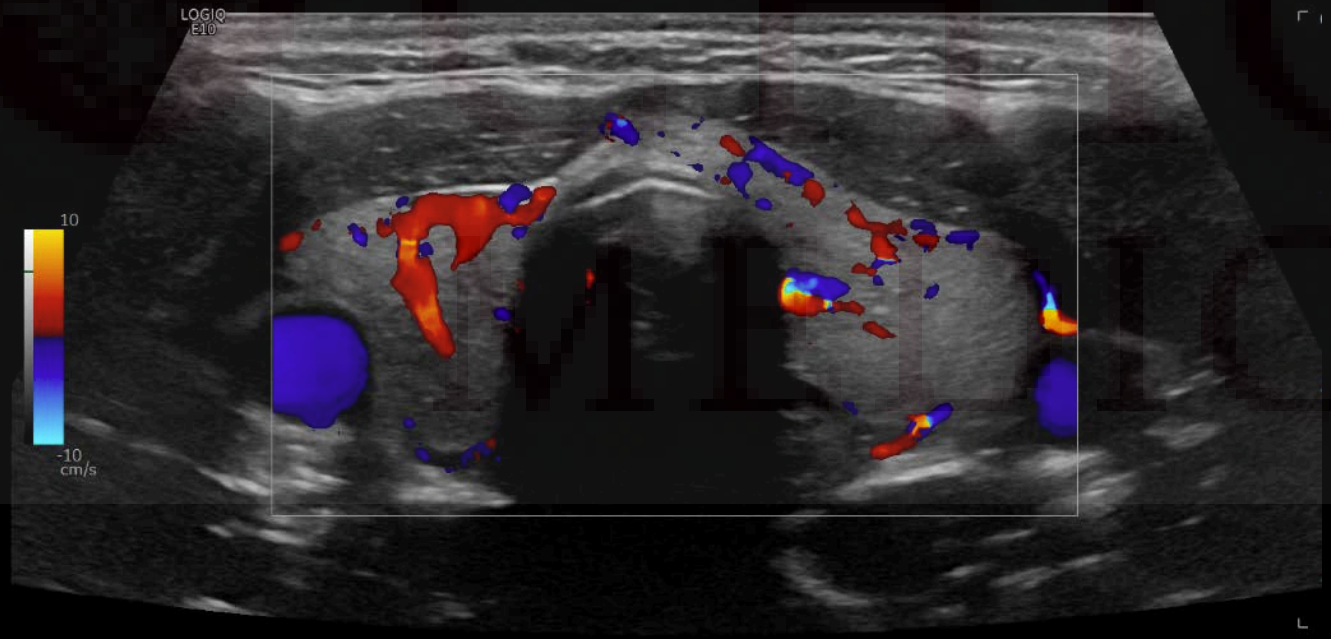
Eur J Epidemiol (2015) 30:1057-1066
N Engl J Med 2009; 360:1639-1645
Obstet Gynecol. 2006;107(3):605-610

	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10
TSH	0.02									
Free T4	6.19									
Total T4										
Free T3	938									
Total T3										
AST	1005									
ALT	2232									
PTU dose										

thyroglobulin antibody: negative
TPO antibody: negative
thyroid stimulating immunoglobulin: negative



Trans Thyroid ML



Parameter	Value	m1
B Mode Measurements		
Isthmus AP	0.30 cm	0.30
Rt Thyroid		
L	4.61 cm	4.61
H	1.20 cm	1.20
W	1.30 cm	1.30
Vol	3.45 ml	3.45
Lt Thyroid		
L	4.27 cm	4.27
H	1.06 cm	1.06
W	1.48 cm	1.48
Vol	3.20 ml	3.20

IMPRESSION:
1. Homogeneous thyroid gland with normal vascularity. Nonspecific solid left lobe nodule of low morphologic suspicion.

Additional imaging

Liver ultrasound with doppler

IMPRESSION:

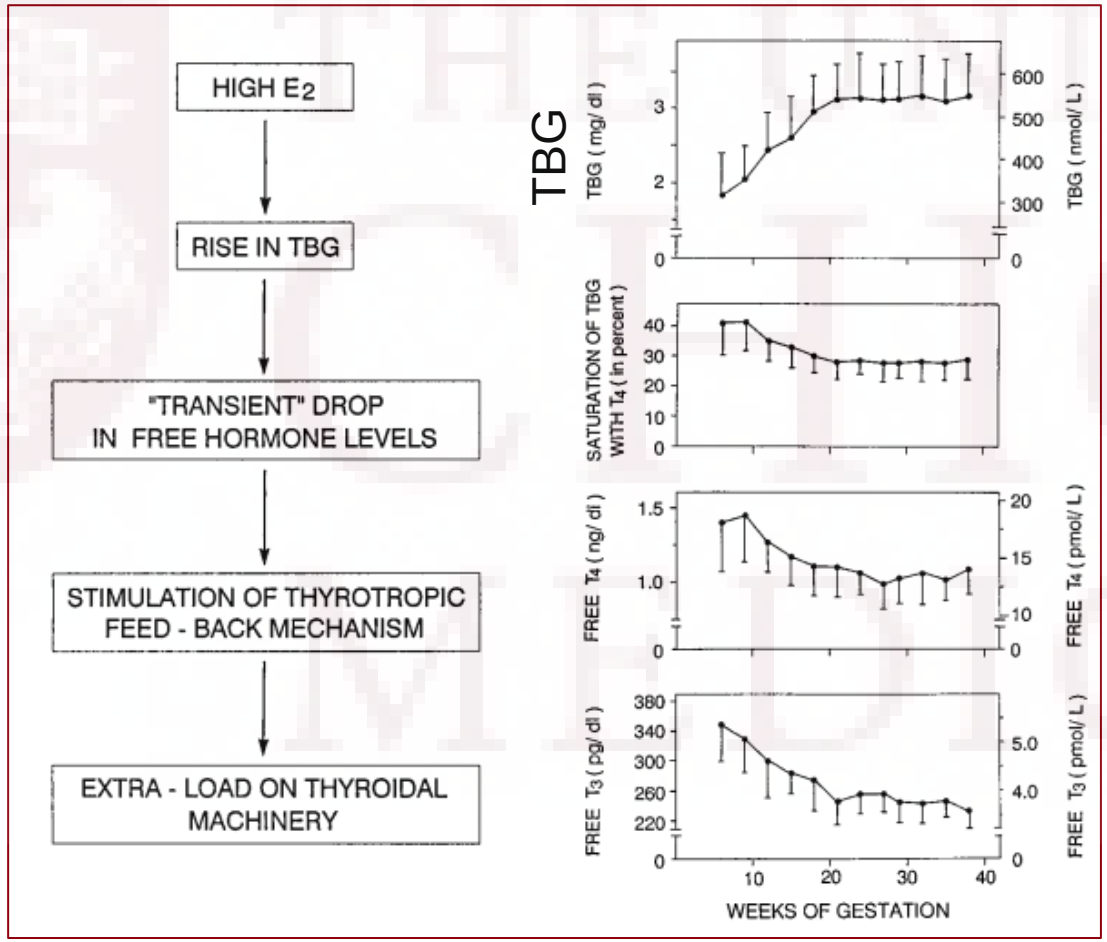
1. Patent hepatic vascularity with appropriate flow direction.
2. Increased resistive indicis of the hepatic arteries, nonspecific, likely related to parenchymal hepatic disease. Coarsening of the hepatic echotexture is seen with parenchymal disease but is nonspecific.
3. Gallbladder sludge.

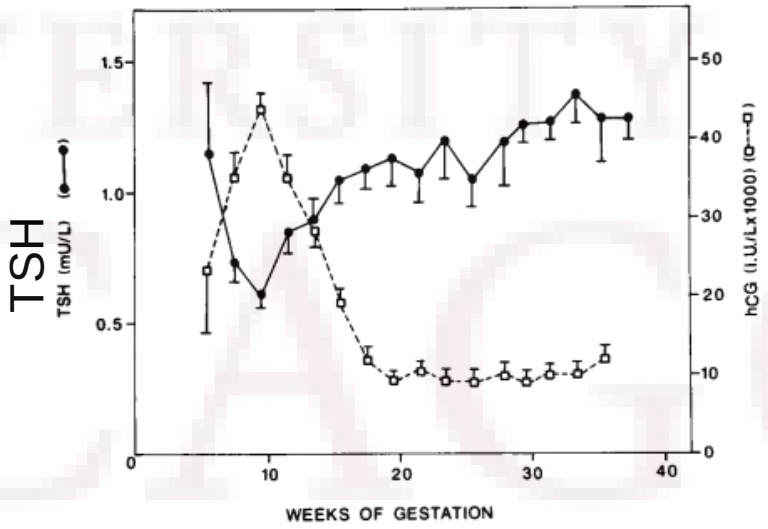
Transvaginal ultrasound

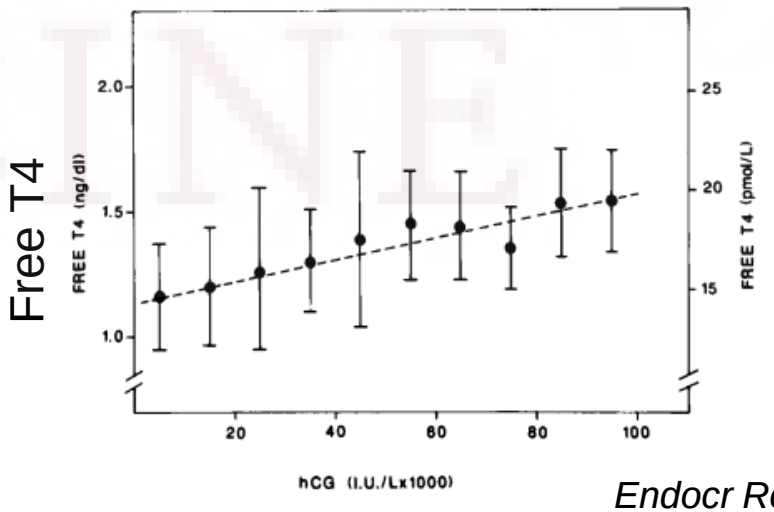
Transvaginal ultrasound at bedside performed to evaluate early pregnancy.
On today's evaluation, there is a live singleton intrauterine pregnancy with CRL measuring consistent with a gestational age 11w 0d with an EDC of 11/12/2020 based on today?s ultrasound.
Of note, the placenta appears larger than it should at 11 weeks gestation. In addition, it has some cystic areas that could represent low flow vascular spaces. The significance of these findings is unclear but could represent a partial mole or presence of a twin pregnancy consisting of molar tissue.
Fetal heart motion is demonstrated at a rate of 150 bpm.
Maternal ovaries are normal in size and appearance.
No free fluid is visualized in the cul- de- sac.

Thyroid function in pregnancy:

Before treating, we need to understand what is “normal.”
Which thyroid hormone values should be used for monitoring?







Endocr Rev. 1997;18(3):404.

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Serum Human Chorionic Gonadotropin Concentrations Greater than 400,000 IU/L Are Invariably Associated with Suppressed Serum Thyrotropin Concentrations

Christina M. Lockwood,[1] David G. Grenache,[2,3] and Ann M. Gronowski[1]

TABLE 2. SERUM THYROTROPIN, FREE THYROXINE, AND HUMAN CHORIONIC GONADOTROPIN CONCENTRATIONS IN VARIOUS SUBGROUPS

Study group	*N*	*Median hCG (range) IU/L*	*Median FT_4 (range) ng/dL*	*Median TSH (range) μIU/mL*	*% with suppressed TSH (≤0.2 μIU/mL)*
All specimens	69	246,106 (200,302–1,459,892)	1.45 (0.91–4.19)	0.07 (0.01–8.15)	67% (46/69)
hCG 200,000–400,000 IU/L	59	239,398 (200,302–385,305)	1.14 (0.91–4.19)	0.08 (0.01–8.15)	61% (36/59)
hCG >400,000 IU/L	10	645,647 (407,674–1,459,892)	2.26 (1.32–3.25)	0.02 (0.01–0.20)	100% (10/10)
Gestational trophoblastic disease	16	423,542 (261,749–1,459,892)	1.97 (1.08–3.25)	0.02 (0.009–1.35)	88% (14/16)
Hyperemesis gravidarum	25	243,970 (205,798–470,816)	1.51 (1.08–4.19)	0.04 (0.019–2.09)	76% (19/25)
All other diagnoses	28	226,155 (200,302–313,408)	1.24 (0.91–1.99)	0.22 (0.009–8.15)	46% (13/28)

Nonpregnant reference intervals: TSH = 0.35–5.5 μIU/mL; FT_4 = 0.9–1.8 ng/dL.

Thyroid. 2009;19(8):863.

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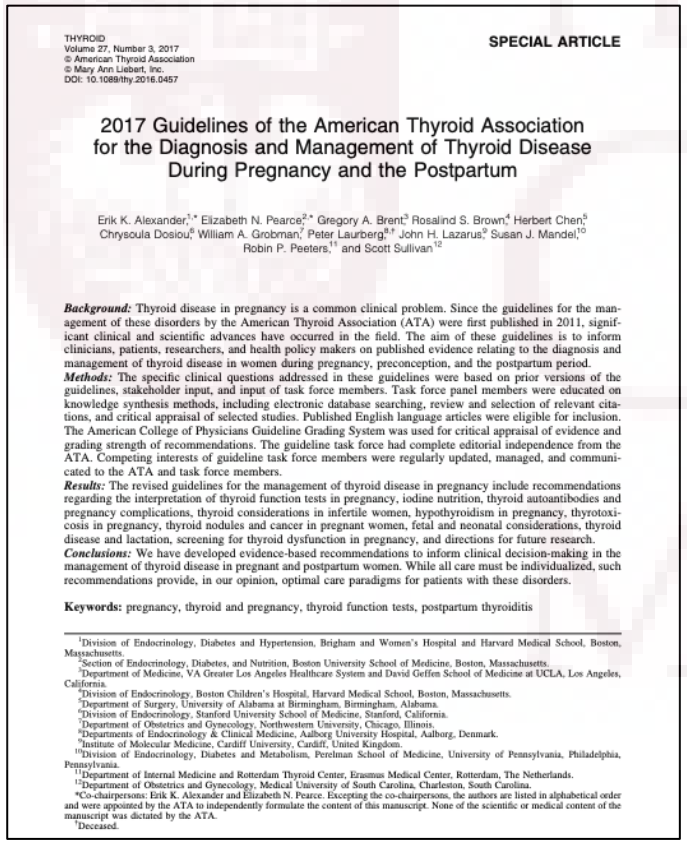

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SPECIAL ARTICLE

2017 Guidelines of the American Thyroid Association for the Diagnosis and Management of Thyroid Disease During Pregnancy and the Postpartum

Erik K. Alexander,[1,*] Elizabeth N. Pearce,[2,*] Gregory A. Brent,[3] Rosalind S. Brown,[4] Herbert Chen,[5] Chrysoula Dosiou,[6] William A. Grobman,[7] Peter Laurberg,[8,†] John H. Lazarus,[9] Susan J. Mandel,[10] Robin P. Peeters,[11] and Scott Sullivan[12]

Background: Thyroid disease in pregnancy is a common clinical problem. Since the guidelines for the management of these disorders by the American Thyroid Association (ATA) were first published in 2011, significant clinical and scientific advances have occurred in the field. The aim of these guidelines is to inform clinicians, patients, researchers, and health policy makers on published evidence relating to the diagnosis and management of thyroid disease in women during pregnancy, preconception, and the postpartum period.
Methods: The specific clinical questions addressed in these guidelines were based on prior versions of the guidelines, stakeholder input, and input of task force members. Task force panel members were educated on knowledge synthesis methods, including electronic database searching, review and selection of relevant citations, and critical appraisal of selected studies. Published English language articles were eligible for inclusion. The American College of Physicians Guideline Grading System was used for critical appraisal of evidence and grading strength of recommendations. The guideline task force had complete editorial independence from the ATA. Competing interests of guideline task force members were regularly updated, managed, and communicated to the ATA and task force members.
Results: The revised guidelines for the management of thyroid disease in pregnancy include recommendations regarding the interpretation of thyroid function tests in pregnancy, iodine nutrition, thyroid autoantibodies and pregnancy complications, thyroid considerations in infertile women, hypothyroidism in pregnancy, thyrotoxicosis in pregnancy, thyroid nodules and cancer in pregnant women, fetal and neonatal considerations, thyroid disease and lactation, screening for thyroid dysfunction in pregnancy, and directions for future research.
Conclusions: We have developed evidence-based recommendations to inform clinical decision-making in the management of thyroid disease in pregnant and postpartum women. While all care must be individualized, such recommendations provide, in our opinion, optimal care paradigms for patients with these disorders.

Keywords: pregnancy, thyroid and pregnancy, thyroid function tests, postpartum thyroiditis

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*Co-chairpersons: Erik K. Alexander and Elizabeth N. Pearce. Excepting the co-chairpersons, the authors are listed in alphabetical order and were appointed by the ATA to independently formulate the content of this manuscript. None of the scientific or medical content of the manuscript was dictated by the ATA.
†Deceased.

Question 3: What is the optimal method to assess serum T4 concentration during pregnancy?

■ **RECOMMENDATION 2**

The accuracy of serum FT4 measurement by the indirect analog immunoassays is influenced by pregnancy and also varies significantly by manufacturer. If measured in pregnant women, assay method-specific and trimester-specific pregnancy reference ranges should be applied.

Strong recommendation, moderate-quality evidence.

■ **RECOMMENDATION 3**

In lieu of measuring FT4, TT4 measurement (with a pregnancy-adjusted reference range) is a highly reliable means of estimating hormone concentration during the last part of pregnancy. Accurate estimation of the FT4 concentrations can also be done by calculating a FT4 index.

Strong recommendation, moderate-quality evidence.

Weeks 7 – 12:

- normal TSH 0.1 – 4
- total T4 ULN increased by 5%/week for 10 weeks

After week 16:

- TSH range gradually returns to normal
- Total T4 stabilizes at 50% greater than normal levels

Thyroid. 2017;27(3):315.

Causes of suppressed TSH and elevated T4 during pregnancy

causes unique to pregnancy

1. Normal physiology of pregnancy
   - hCG activity and increased TBG
2. Hyperemesis gravidarum
   - high hCG levels, more thyroid stimulating activity, mild T4 elevation, weeks duration at most
3. Gestational transient thyrotoxicosis
   - occurs at peak hCG, mild T4 elevation
4. Trophoblastic hyperthyroidism
   - previously found commonly, but earlier diagnosis of GTD has decreased incidence of the thyroid component
5. Familial gestational hyperthyroidism
   - TSH receptor mutation leads to increased sensitivity to hCG

causes not unique to pregnancy

1. Graves' Disease
2. Toxic multinodular goiter/toxic nodule
3. Hyperthyroid phase of thyroiditis
4. Exogenous thyroid hormone intake (prescription medication and supplements)

6. (post-partum thyroiditis)

Brief Report

Familial Gestational Hyperthyroidism Caused by a Mutant Thyrotropin Receptor Hypersensitive to Human Chorionic Gonadotropin

Patrice Rodien, M.D., Ph.D., Catherine Brémont, M.D., Marie-Laure Raffin Sanson, M.D., Jasmine Parma, Ph.D., Jacqueline Van Sande, Ph.D., Sabine Costagliola, Ph.D., Jean-Pierre Luton, M.D., Gilbert Vassart, M.D., Ph.D., and Laurence Duprez, M.D., Ph.D.

recurrent gestational hyperthyroidism and normal serum chorionic gonadotropin concentrations. Both women were heterozygous for a missense mutation in the extracellular domain of the thyrotropin receptor. The mutant receptor was more sensitive than the wild-type receptor to chorionic gonadotropin, thus accounting for the occurrence of hyperthyroidism despite the presence of normal chorionic gonadotropin concentrations.

SOME degree of stimulation of the thyroid gland by human chorionic gonadotropin is common during early pregnancy.[1-3] When serum chorionic gonadotropin concentrations are abnormally high — for example, in women with molar pregnancies — overt hyperthyroidism may ensue. The pathophysiologic mechanism is believed to be promiscuous stimulation of the thyrotropin receptor by the excess chorionic gonadotropin.[4,5] The explanation for this stimulation is the close structural relations between chorionic gonadotropin and thyrotropin and between their receptors.[6]

Hyperemesis gravidarum is characterized by excessive vomiting in early pregnancy, leading to the loss of 5 percent or more of body weight.[4] It is usually self-limited and therefore of little clinical consequence.[5,7] Some women with the disorder have high serum thyroid hormone concentrations, and a few have sufficient clinical manifestations of hyperthyroidism to warrant short-term treatment with antithyroid drugs.[8,9] Many but not all women with hyperemesis gravidarum and hyperthyroidism have high serum chorionic gonadotropin concentrations, raising the possibility that other factors contribute to the hyperthyroidism.[3,8,9]

We describe a woman and her mother who had

From the Institut de Recherche Interdisciplinaire (P.R., J.P., J.V., S.C., G.V., L.D.) and Service de Génétique Médicale (J.P., G.V.), Faculté de Médecine, Université Libre de Bruxelles, Brussels, Belgium; the Service d'Endocrinologie Maladies Métaboliques, Hôpital Cochin, Paris (P.R., C.B., J.-P.L.); and the Centre National pour la Recherche Scientifique, Unité Propre de Recherche 1524, Paris (M.-L.R.S.). Address reprint requests to Dr. Vassart at IRIBHN, Campus Erasme, 808 Route de Lennik, B-1070 Brussels, Belgium.

Case Report

The proband was a 27-year-old woman who was 10 weeks' pregnant when referred for the evaluation and treatment of hyperthyroidism. This was her third pregnancy, the first and second having resulted in early miscarriage accompanied by severe nausea and vomiting. She again reported severe nausea and vomiting and had recently lost 5 kg in weight. Physical examination revealed persistent tachycardia (heart rate, 120 beats per minute), excessive sweating, and tremor of the hands. There was a small, diffuse goiter and no ophthalmopathy. Laboratory studies revealed the following values: serum thyrotropin concentration, <0.07 μU per milliliter (normal, 0.2 to 6); serum free thyroxine concentration, 4.7 ng per deciliter (60 pmol per liter; normal, 0.8 to 1.9 ng per deciliter [11 to 24 pmol per liter]); and serum triiodothyronine concentration, 605 ng per deciliter (9.77 nmol per liter; normal, 65 to 170 ng per deciliter [1.05 to 2.75 nmol per liter]). No antibodies to thyroid peroxidase or the thyrotropin receptor were detected in serum.

The patient was treated with 450 mg of propylthiouracil per day for eight weeks, and the dose was then tapered to 150 mg per day. Her condition improved rapidly, and she remained clinically and biochemically euthyroid for the rest of her pregnancy. She delivered a normal girl at 38 weeks of gestation, at which time the propylthiouracil was discontinued. The patient did not return for a follow-up examination post partum.

Eighteen months later, after seven weeks of amenorrhea, she was referred for a recurrence of hyperthyroidism associated with hyper-

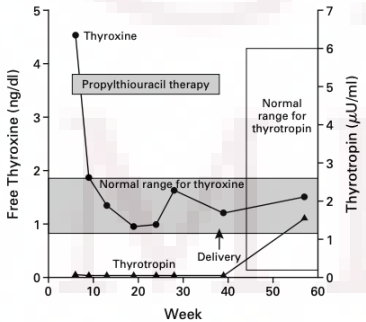


Figure 1. Serum Free Thyroxine and Thyrotropin Concentrations during the Index Patient's Fourth Pregnancy.

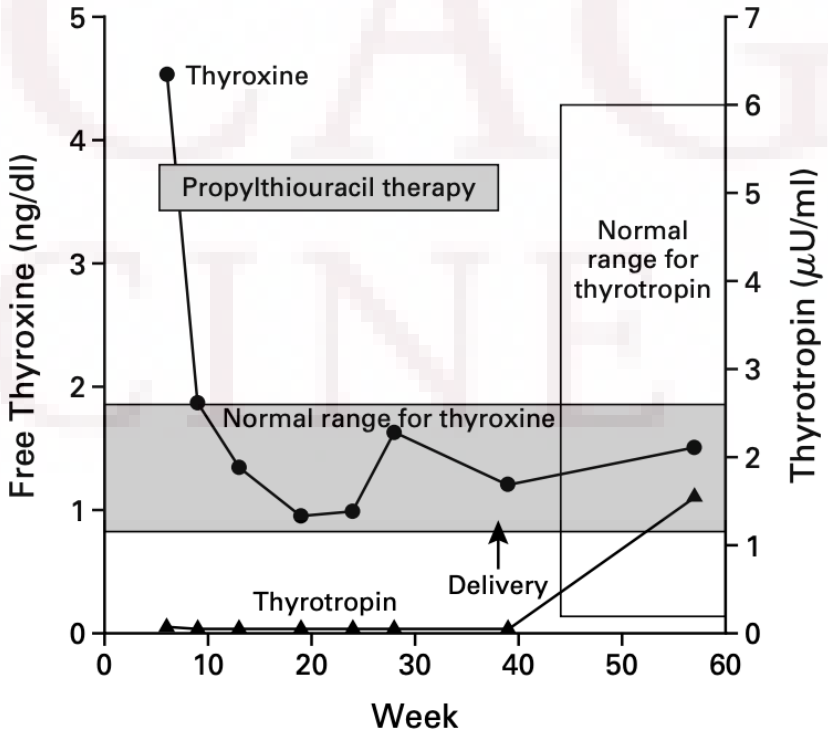
To convert values for serum free thyroxine to picomoles per liter, multiply by 12.9.

The case of a woman and her mother who both had recurrent gestational hyperthyroidism despite normal serum β-hCG levels.

A 27 year old woman presented for evaluation and treatment of hyperthyroidism at 10 weeks gestation. Two prior pregnancies were characterized by severe nausea/vomiting and both resulted in miscarriage.

The patient was found to have a TSH of < 0.1 and a FT4 of 4.7 ng/dL. Anti-TPO and TrAB were negative. There was no evidence of ophthalmopathy.

The patient was treated with PTU for the duration of her pregnancy and did well, with thyroid function normalizing off therapy after pregnancy.



N Engl J Med 1998; 339:1823-1826

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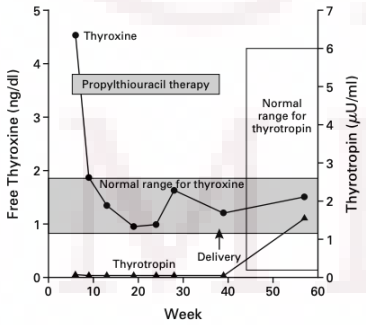

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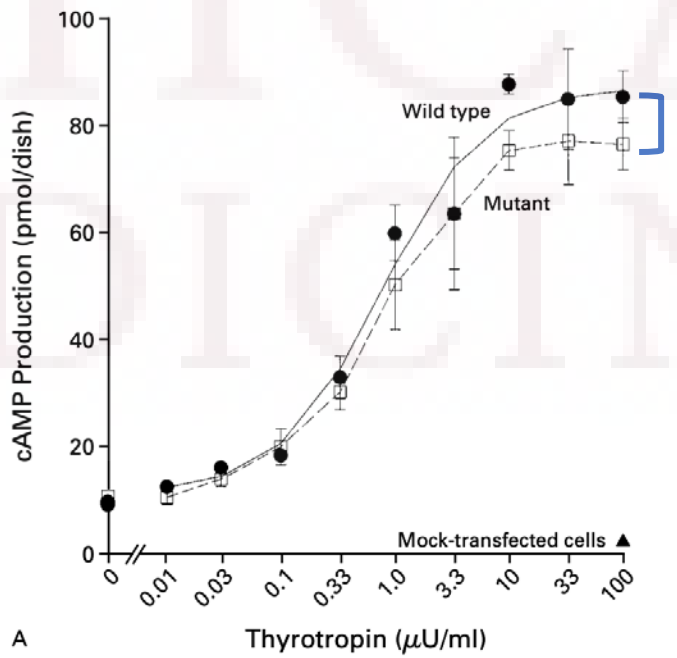
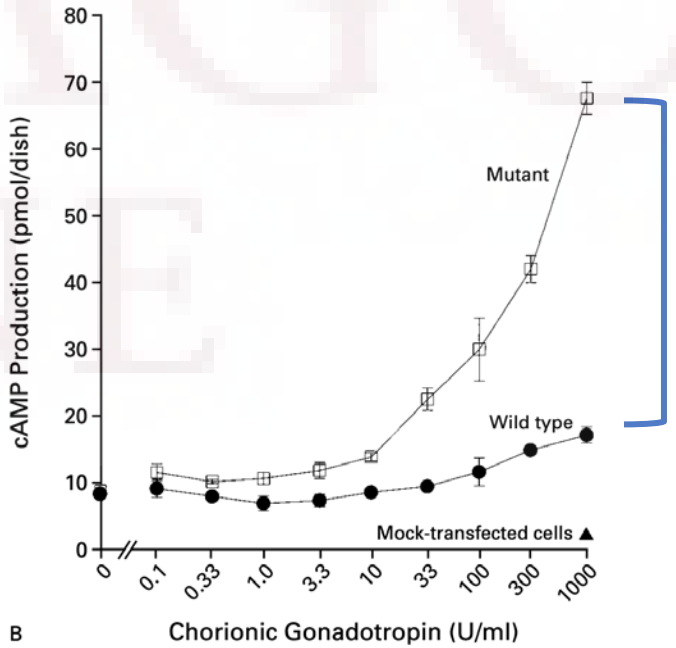
18 months later, the patient presented with 7 weeks of amenorrhea and found to be hyperthyroid again with a hCG level within the normal level at the time of gestation. She was again started on PTU.

After investigation, it was found that the patient's mother described a very similar history of nausea, vomiting and miscarriage before a term pregnancy in which she was treated with carbimazole.

Direct PCR sequencing isolated a K183R (arginine for lysine) located in the middle of the N-terminal domain of the TSH receptor in both mother and daughter.

cAMP production in response to TSH and hCG in the wildtype and mutant TSH receptor-transfected cells is shown below:





N Engl J Med 1998; 339:1823-1826

Yes, this sample is in progress. Results are expected by 6/8.

Alie

Alie Corirossi, MS
Laboratory Genetic Counselor
The University of Chicago
5841 S. Maryland Ave. | Rm. O-510 , MC0077 | Chicago, IL 60637
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dnatesting.uchicago.edu | @UChicagoGenes

On 4/29/20, 10:57 AM, "Ettleson, Matthew [UCM]" <Matthew.Ettleson@uchospitals.edu> w

[redacted]

On 4/29/20, 10:54 AM, "Magnante, Alexandra [HGD]" <magnante@bsd.uchicago.edu> wr

Hi Matt,

Could you please provide me with the patient's name and DOB?

Thanks,
Alie

Alie Corirossi, MS
Laboratory Genetic Counselor

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Treatment of hyperthyroidism in pregnancy

Clinical analysis of 65 cases of hyperemesis gravidarum with gestational transient thyrotoxicosis

Shuiya Sun[1,2], Xia Qiu[1] and Jiaqiang Zhou[1]

[1]*Department of Endocrinology, Sir Run Run Shaw Hospital, Zhejiang University School of Medicine, Hangzhou, and*
[2]*Jiaxing Maternity and Child Health Care Hospital, Jiaxing, Zhejiang, China*

Table 4 Course of TSH, FT3 and FT4 in patients with hyperemesis gravidarum and subclinical or clinical GTT

	TSH (mIU/L)	FT3 (pmol/L)	FT4 (pmol/L)
Hyperemesis gravidarum and subclinical GTT ($n = 8$)			
At admission	0.08 (0.01–0.19)	4.19 (3.49–5.51)	14.78 (11.06–19.21)
One month later	0.20 (0.02–0.31)	4.20 (3.32–5.67)	15.28 (11.05–18.31)
Two months later	1.04 (0.35–3.79)	4.65 (3.09–5.93)	15.15 (10.05–19.17)
Hyperemesis gravidarum and clinical GTT ($n = 26$)			
At admission	0.01 (0–0.14)	5.95 (3.7–10.98)	26.49 (19.28–46.43)
One month later	0.02 (0–0.32)	5.92 (4.05–10.94)	21.85 (10.55–43.78)
Two months later	0.83 (0.25–2.46)	5.29 (3.64–6.02)	15.76 (9.63–20.36)

FT3, free T3; FT4, free T4; GTT, gestational transient thyrotoxicosis; TSH, thyroid-stimulating hormone.

Thyroid function normalized by the second trimester without antithyroid treatment. There was no association found between gestational transient thyrotoxicosis and pregnancy outcomes.

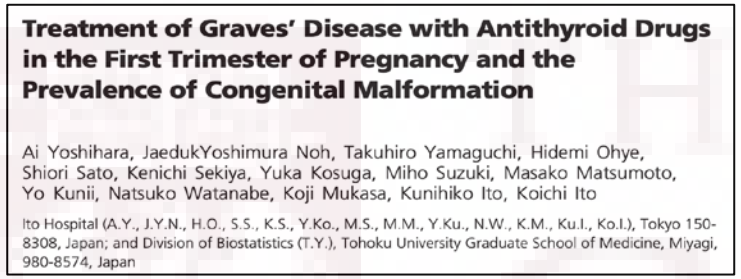
Generally, antithyroid therapy is not recommended in typical cases of transient thyrotoxicosis.

J. Obstet. Gynaecol. Res. Vol. 40: 1567-1572.

Treatment of hyperthyroidism in pregnancy

use of antithyroid drugs and fetal malformations: an update

Japan 2012



Treatment of Graves' Disease with Antithyroid Drugs in the First Trimester of Pregnancy and the Prevalence of Congenital Malformation

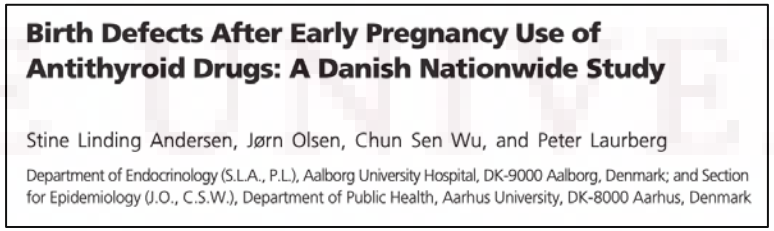
Ai Yoshihara, JaedukYoshimura Noh, Takuhiro Yamaguchi, Hidemi Ohye, Shiori Sato, Kenichi Sekiya, Yuka Kosuga, Miho Suzuki, Masako Matsumoto, Yo Kunii, Natsuko Watanabe, Koji Mukasa, Kunihiko Ito, Koichi Ito

Ito Hospital (A.Y., J.Y.N., H.O., S.S., K.S., Y.Ko., M.S., M.M., Y.Ku., N.W., K.M., Ku.I., Ko.I.), Tokyo 150-8308, Japan; and Division of Biostatistics (T.Y.), Tohoku University Graduate School of Medicine, Miyagi, 980-8574, Japan

Prevalence of birth defects:
MMI: 4.1% (p = 0.002)
PTU: 1.9%
non-exposed: 2.1%

MMI was associated with VSD and aplasia cutis and omphalocele
PTU was associated with congenital heart defects

Denmark 2014



Birth Defects After Early Pregnancy Use of Antithyroid Drugs: A Danish Nationwide Study

Stine Linding Andersen, Jørn Olsen, Chun Sen Wu, and Peter Laurberg

Department of Endocrinology (S.L.A., P.L.), Aalborg University Hospital, DK-9000 Aalborg, Denmark; and Section for Epidemiology (J.O., C.S.W.), Department of Public Health, Aarhus University, DK-8000 Aarhus, Denmark

Prevalence of birth defects:
MMI: 9.1%
PTU: 8.0%
non-exposed: 5.7% (p <0.001)

MMI was associated with MSK, skin, and digestive defects
PTU was urinary defects, face and neck defects

Birth defects were associated use of MMI and PTU and shift between the medications in early pregnancy.

Sweden 2017

Birth defects after use of antithyroid drugs in early pregnancy: a Swedish nationwide study

Stine Linding Andersen[1,2], Stefan Lönn[3], Peter Vestergaard[1,4] and Ove Törring[5,6]

[1]Departments of Endocrinology and [2]Clinical Biochemistry, Aalborg University Hospital, Aalborg, Denmark, [3]Department of Research and Development, Region Halland, Halmstad, Sweden, [4]Department of Clinical Medicine, Aalborg University, Aalborg, Denmark, [5]Department of Clinical Research and Education, Södersjukhuset, Karolinska Institutet, Stockholm, Sweden, and [6]Division of Endocrinology, Department of Internal Medicine, Södersjukhuset, Stockholm, Sweden

Correspondence should be addressed to S L Andersen
Email

Cumulative incidence of birth defects:
MMI: 6.8% (NS)
PTU: 6.4% (NS)
non-exposed: 8.0% (NS)

MMI was associated with septal heart defects
PTU was associated with ear and urinary defects

J Clin Endocrinol Metab, July 2012, 97(7):2396-2403.

J Clin Endocrinol Metab, Nov 2013, 98(11):4373-4381.

Eur J Endocrinol. 2017 Oct;177(4):369-378.

Treatment of hyperthyroidism in pregnancy

use of antithyroid drugs and fetal malformations: an update

South Korea 2018

Annals of Internal Medicine ORIGINAL RESEARCH

Antithyroid Drugs and Congenital Malformations

A Nationwide Korean Cohort Study

Gi Hyeon Seo, MD*; Tae Hyuk Kim, MD, PhD*; and Jae Hoon Chung, MD, PhD

Increased prevalence of birth defects:
MMI: 17.05/1000 live births
PTU: 8.81/1000 live births
MMI + PTU: 16.53/1000 live births

Higher doses of **MMI** were associated with increased likelihood of birth defects.

Switching between PTU and MMI during the first trimester (and up to 3 months prior to pregnancy) did not alter the overall risk of birth defect.

Is it reasonable to switch patients to PTU prior to initiation of efforts to conceive, i.e should PTU be started before birth control is stopped?

Ann Intern Med. 2018 Mar 20;168(6):405-413.

Table 8. Advantages and Disadvantages of Therapeutic Options for Women with Graves' Disease Seeking Future Pregnancy

Therapy	*Advantages*	*Disadvantages*
Antithyroid drugs	Effective treatment to euthyroid state within 1–2 months	Medication adverse effects (mild 5%–8%; severe 0.2%)
	Often induces gradual remission of autoimmunity (decreasing antibody titers)	Birth defects associated with use during pregnancy (MMI 3%–4%; PTU 2%–3% though less severe)
	Easily discontinued or modified. Treatment easy to take. Relatively inexpensive	Relapse after drug withdrawal likely in 50%–70%
Radioactive iodine	Easy oral administration	Repeat therapy at times necessary
	Reduction in goiter size	Rising antibody titers following treatment may contribute to worsening orbitopathy or fetal risk
	Future relapse of hyperthyroidism very rare	Lifelong need of levothyroxine therapy following ablation
Thyroidectomy	Definitive therapy of hyperthyroidism. Stable euthyroid state easily achieved on replacement levothyroxine therapy	Life-long need for levothyroxine supplementation
	Post surgery, gradual remission of autoimmunity occurs	Surgical complications occur in 2%–5%
	Goiter disappears	Healing and recovery from surgery Permanent neck scar

MMI, methimazole; PTU, propylthiouracil.

Thyroid. 2017;27(3):315.

Patient follow up:

TSH-receptor mutation: pending
Chorionic villus sampling: completed, normal FISH results
Patient referred to Access Health (UC OON)

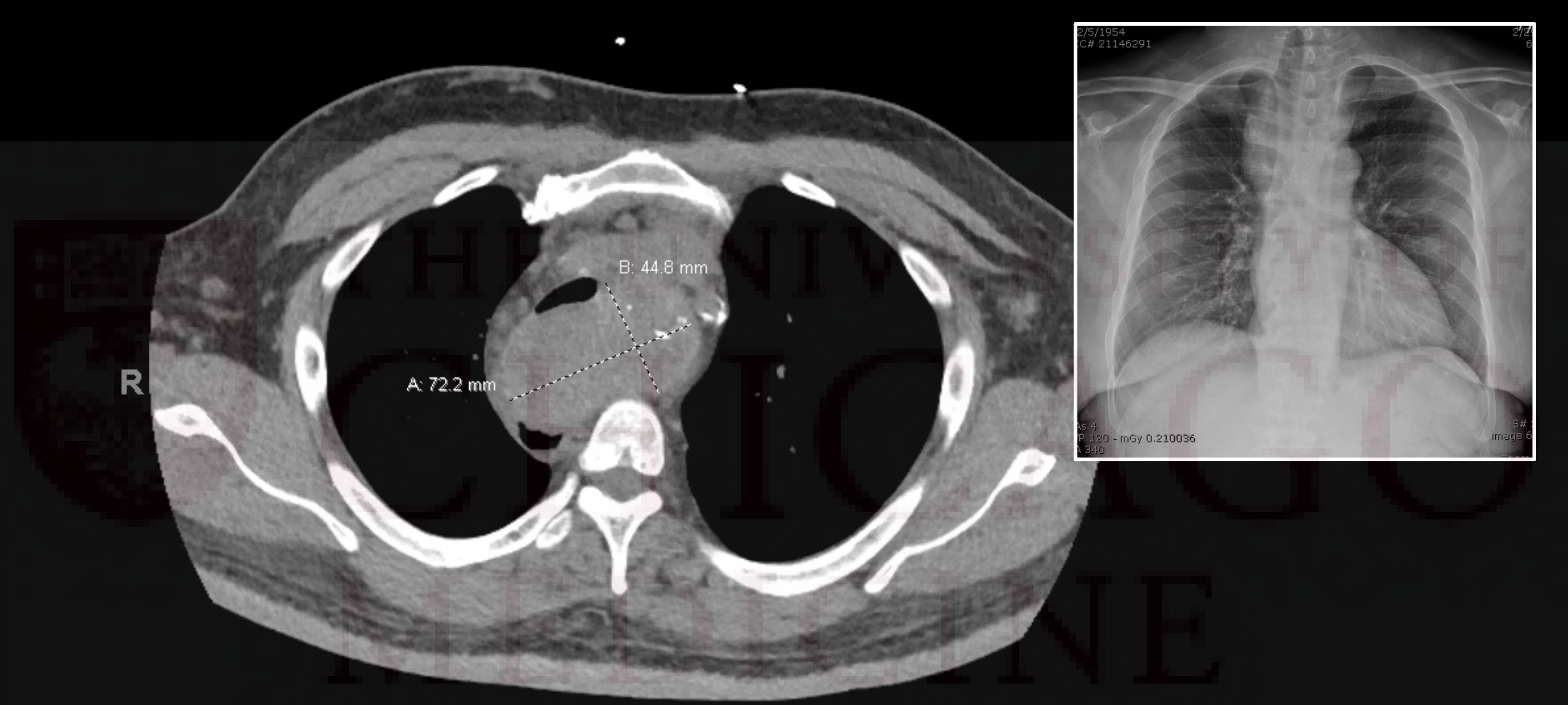
Bonus case:

A 66 year old man with mediastinal mass and abnormal thyroid function tests

A 66 year old patient presented with a chief complaint of dysphagia. In addition of a history of COPD, hypertension, diabetes and ESRD on dialysis, he had a history of hyperthyroidism of unclear etiology but reported a history of hemi-thyroidectomy (1997).

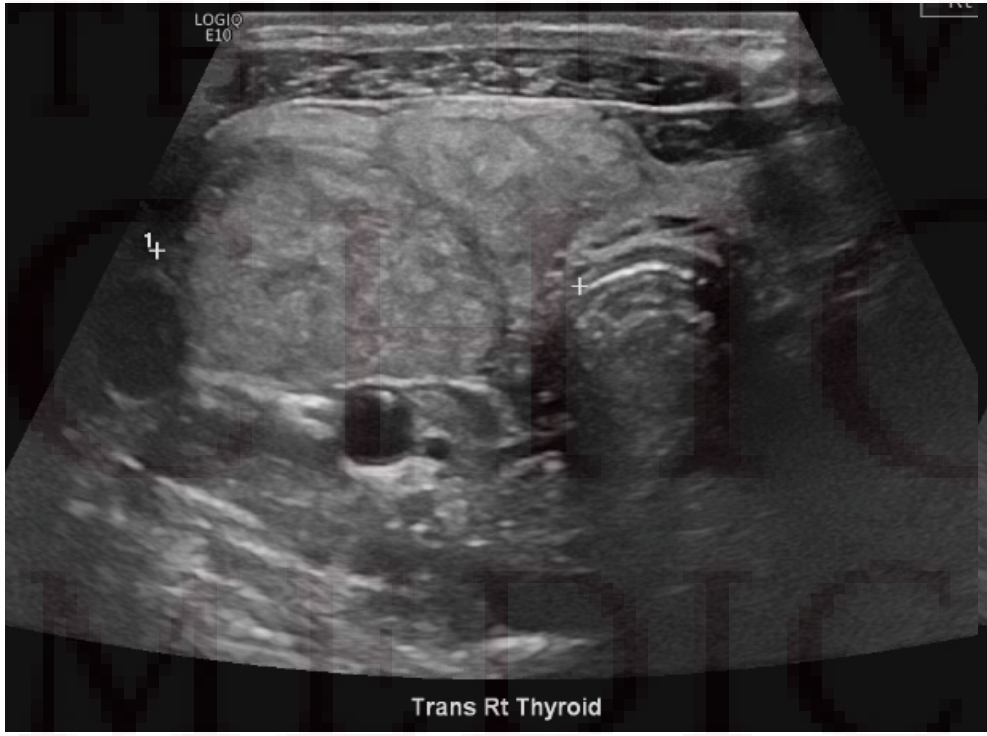
Due to the presentation of dysphagia, he underwent CT imaging of his chest.

Due to his unclear history of thyroid disease, he had thyroid function testing.



Impression: retrotracheal mass with sheetlike calcifications. 7.2 x 4.5 cm. Appearance is similar to prior imaging. Mild compression of the esophagus and tracheal deviation are seen.

TSH 0.01
Free T4: 1.32
Total T4: 7.9
Free T3: 212
Total T3: 68
Tg Ab: neg
TPO Ab: neg



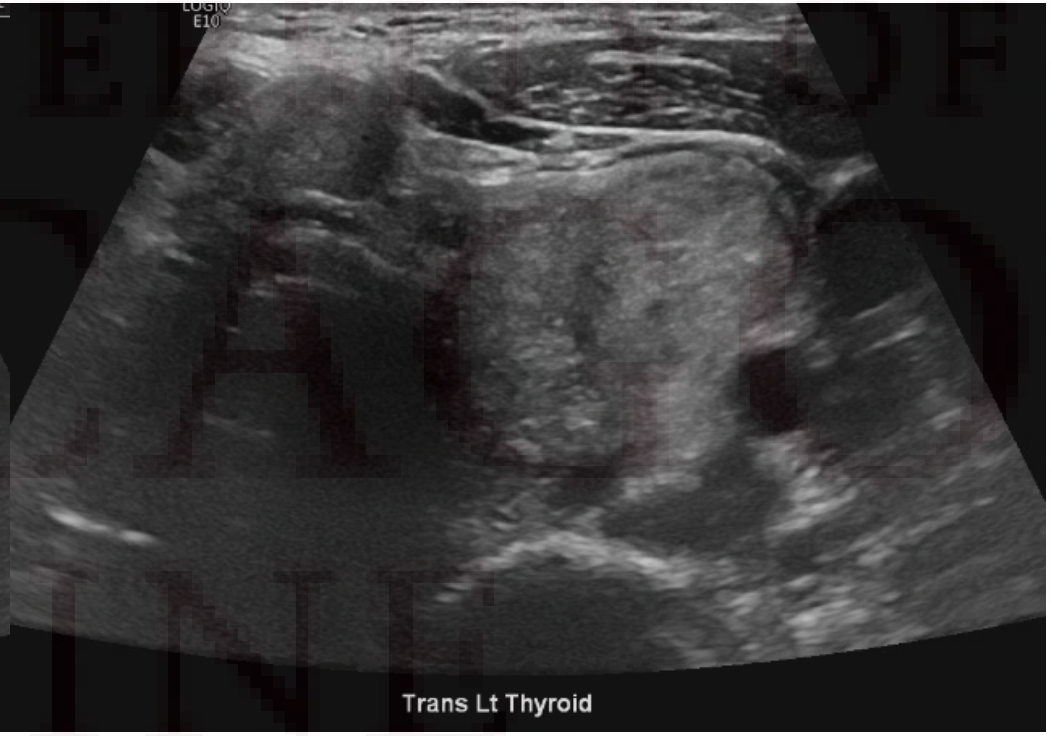


TABLE 10. SUBCLINICAL HYPERTHYROIDISM: WHEN TO TREAT

Factor	*TSH (<0.1 mU/L)*	*TSH (0.1–0.4 mU/L)*[a]
Age >65 years	Yes	Consider treating
Age <65 years with comorbidities		
Heart disease	Yes	Consider treating
Osteoporosis	Yes	Consider treating
Menopausal, not on estrogens or bisphosphonates	Yes	Consider treating
Hyperthyroid symptoms	Yes	Consider treating
Age <65 years, asymptomatic	Consider treating	Observe

[a]Where 0.4 mU/L is the lower limit of the normal range.

Plan:

Treatment in this case for subacute hyperthyroidism is not urgent, but would be recommended. No treatment at this time given swallowing difficulty, but when he is able to take enteral medications we recommend starting methimazole 5mg daily.

Eventually, as an outpatient, thyroid uptake and scan can be done to further determine etiology of hyperthyroidism.

Thyroid. 2016;26(10):1343.

pathology

May, 2020

EBUS/FNA

Diagnosis
Needle Aspiration - Mediastinal Mass:

Benign appearing thyroid follicular cells

Note: The specimen consists of follicular cell groups of variable size. PAX-8 and TTF-1 (thyroid markers) immunostains are positive in the target cells (controls are appropriate). The cell morphology and stain profile support the above diagnosis.

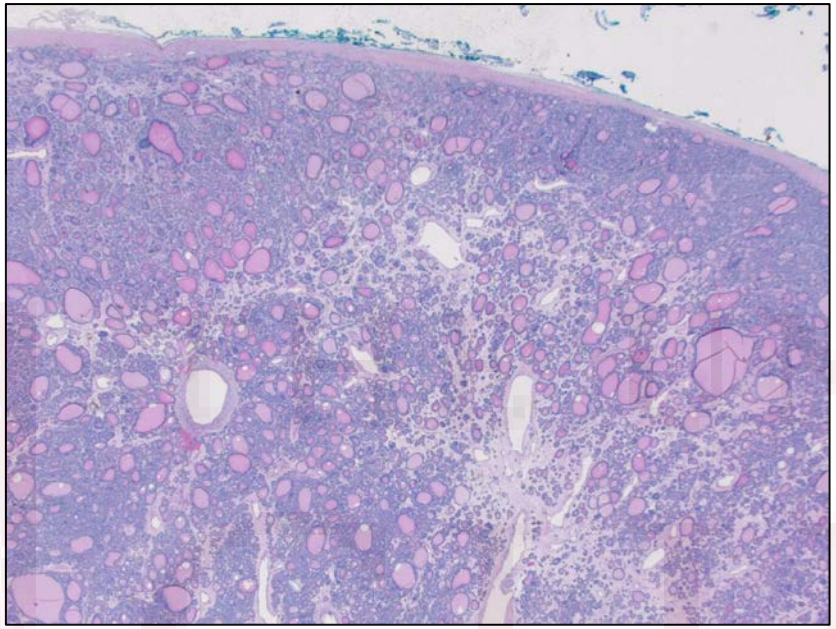
R thoracotomy/mass excision

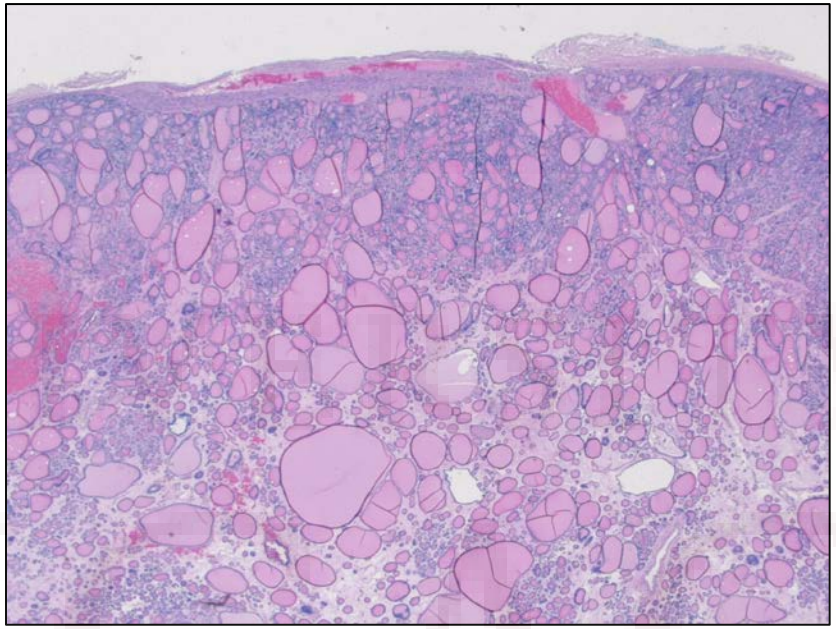
FINAL PATHOLOGIC DIAGNOSIS
A. Portion of 5th rib; excision:
- Lamellar bone and hematopoietic marrow.

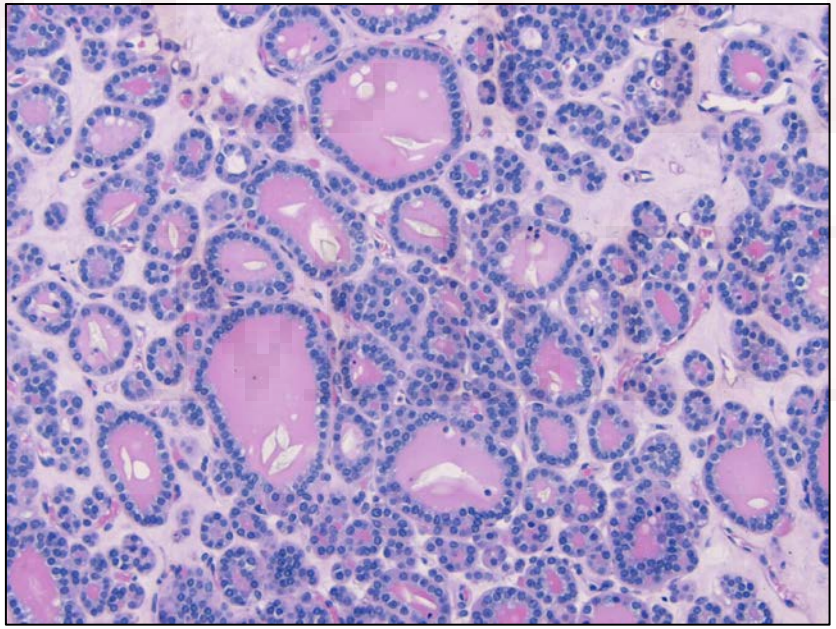
B. Mediastinal mass; resection (130.5 g):
- Microfollicular thyroid lesion (10 cm) with focal calcification and stromal degenerative change, see comment.

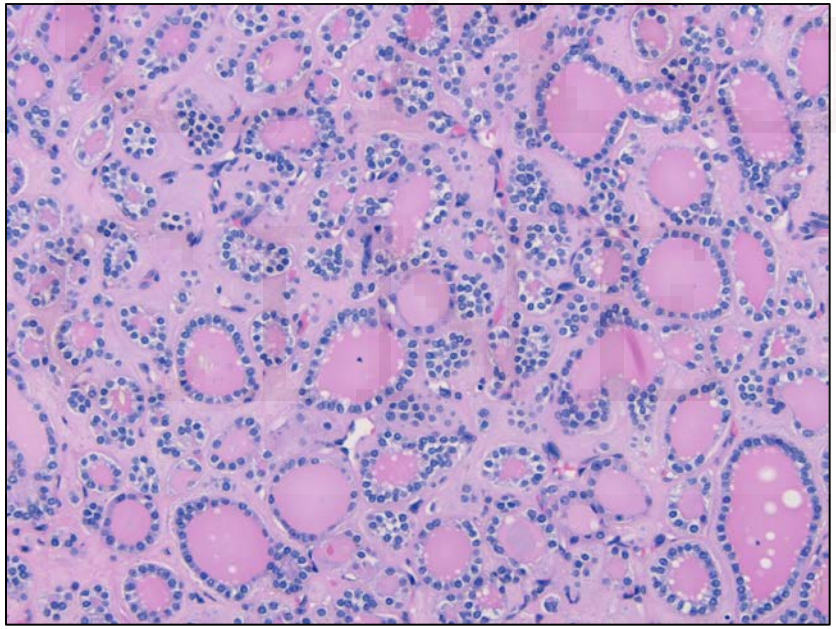
Comment
The mediastinal mass consists entirely of thyroid tissue with a predominantly microfollicular growth pattern. The lesion is well-circumscribed with a focal thin fibrous capsule. There is no evidence of papillary hyperplasia, inflammation, intralesional fibrosis, solid growth, increased mitoses, or overt invasion of adjacent soft tissue. The features raise the possibility of Graves disease / hyperplasia versus a bland follicular neoplasm. There is no definite evidence of malignancy.

No note in imaging or operative report identified a connection between the mediastinal mass and cervical thyroid tissue.









Courtesy of Dr. Nicole Cipriani

Posterior Mediastinal Ectopic Thyroid: An Unusual Cause for Dysphagia

Recep Demirhan, MD, Burak Onan, MD, Kursad Oz, MD, Sevinc Hallac Keser, MD, Aylin Ege Gul, MD, and Ismihan Selen Onan, MD

Departments of Thoracic Surgery and Pathology, Dr Lutfi Kirdar Kartal Education and Research Hospital, and Department of Cardiovascular Surgery, Istanbul Bilim University, Istanbul, Turkey

Posterior mediastinum is an atypical localization for the occurrence of ectopic thyroid. We present a case of a 62-year-old man who was admitted to the emergency department with atypical chest pain and dysphagia. The patient was diagnosed as having a true posterior mediastinal ectopic thyroid, which caused esophageal compression. The tumor was completely resected through a sternotomy, with favorable outcome and relief of symptoms.

(Ann Thorac Surg 2009;88:656–9)

Ectopic thyroid may develop anywhere from the foramen cecum to the lower neck due to abnormal migration of the thyroid tissue. True primary ectopic thyroid tumors are encountered in less than 1% of all goiters [1], but the incidence of posterior mediastinal localization is not clear. Although different types of pathologies, including neurogenic, lymphatic, mesenchymal, pleural, osteal, and esophageal tumors can be diagnosed in the posterior mediastinum, ectopic thyroid is still considered a diagnostic possibility. The tumor, if of considerable size, may cause obstructive symptoms related to tracheal, esophageal, or venous compression. We

Accepted for publication Feb 2, 2009.

Ectopic thyroid tissue in the mediastinum is rare. Most present as an extension of tissue from the cervical thyroid.

← In this case, a 62 y/o man presented with dysphagia and atypical chest pain of 3 months duration. CT imaging confirmed the presence of a mediastinal mass compressing the esophagus. No extension to the cervical region was seen. Notably, the patient had a mildly elevated TSH with normal T4 and T3 levels. The lesion was removed via sternotomy and thyroid tissue was confirmed on pathology.

← Discussion:

True primary ectopic goiters make up less than 1% of all goiters.

Some patients after thyroid surgery are found to have a significant intrathoracic component, although these tend to be in the anterior or middle mediastinum.

Ectopic thyroid mass as a cause of dysphagia is very rare.

Ann Thorac Surg. 2009;88(2):656-9.