Normal thyroid follicles

1. TRH
2. TSH
3. Thyroid growth
4. Hormone synthesis

Lab Tests

Thyroid Lab Tests

T4

TSH
Euthyroidism (Normal)

Primary Hyperthyroidism

Secondary Hyperthyroidism

Primary Hypothyroidism

Secondary Hypothyroidism

Hyperthyroidism
A hypermetabolic state caused by increased thyroid hormone.
Hyperthyroidism Signs and Symptoms

General: weight loss, heat intolerance
Cardiac: rapid pulse, arrhythmias
Neuromuscular: tremor, emotional lability
Skin: warm, moist
Gastrointestinal: diarrhea
Eye: lid lag
Thyroid storm: extreme, dangerous symptoms

Introduction

Hyperthyroidism

Hypothyroidism

A hypometabolic state caused by increased thyroid hormone.

Hypothyroidism Signs and Symptoms

General: fatigue, weight gain, cold intolerance
Cardiac: slow pulse, impaired contraction
Nervous: delayed reflexes, lethargy
Skin: rough, dry, cool
Gastrointestinal: reduced appetite, constipation
Myxedema: deepened voice, “edema”
Myxedema coma: deteriorating mental status
Introduction
Hyperthyroidism
Hypothyroidism
Non-neoplastic diseases

Most common cause of hypothyroidism in the US!
Autoimmune destruction of gland
Diagnostic autoantibodies:
- Anti-thyroglobulin antibody
- Anti-thyroid peroxidase antibody

Hashimoto Thyroiditis

Mrs. Potatohead

Hashimoto thyroiditis: Hürthle cells
DeQuervain Thyroiditis

- Big, sore thyroid
- Recent URI
- Immune cross-reaction with thyroid follicles
- Self-limiting

DeQuervain Thyroiditis
Looks scary
Really harmless
Goes away by itself

Silent Thyroiditis

- Post-partum or middle age.
- Painless, slightly enlarged thyroid.

Silent thyroiditis: lymphoid infiltrate
Reidel Thyroiditis

- Rare!
- Rock-hard neck mass
- Hypothyroidism
- Tracheal compression

Fibrosing Thyroiditis

Woody

Introduction
Hyperthyroidism
Hypothyroidism
Non-neoplastic diseases
- Thyroiditis
- Graves disease

Graves Disease

- Most common cause of hyperthyroidism in the US!
- Classic triad: hyperthyroidism, ophthalmopathy, dermopathy
- Autoimmune stimulation of thyroid
- Diagnostic autoantibody: anti-TSH receptor antibody (stimulates growth)
Introduction
Hyperthyroidism
Hypothyroidism
Non-neoplastic diseases
• Thyroiditis
• Graves disease
• Goiter

Goiter

• “Goiter” = big thyroid gland
• You can see a goiter in Graves disease and in some cases of thyroiditis.
• You can also see a goiter in patients who aren’t making enough T₄.
How you get a goiter from $\downarrow T_4$ synthesis

- no iodine
- enzyme defects
- unknown reasons

Over time, goiters enlarge and become nodular.

- Trauma
- Hyperplasia
- Involution

Introduction
- Hyperthyroidism
- Hypothyroidism
- Non-neoplastic diseases
- Neoplastic diseases
  - Benign
  - Malignant

Introduction
- Hyperthyroidism
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Most neoplasms present as nodules.
- Nodules are common!
- Most are benign.
- Thyroid carcinoma is uncommon.

Thyroid neoplasms

Incidence of thyroid carcinoma vs. adenoma

Thyroid adenoma
- Common!
- Most patients are euthyroid
- Some are hyperthyroid

Thyroid fine needle aspiration

Adenoma
Thyroid adenoma

Treatment: take it out!
Q. Why, if it’s benign?
A. Because thyroid adenomas can look exactly like follicular thyroid carcinoma!

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Incidence of Different Types of Thyroid Carcinoma

- papillary (80%)
- follicular (10%)
- anaplastic (<5%)
- medullary (5%)

Papillary Thyroid Carcinoma

- Most common thyroid malignancy
- Excellent prognosis (>95% 10y survival)
- “Orphan Annie” tumor

Papillary thyroid carcinoma

Papillary carcinoma: Orphan Annie nuclei
Papillary carcinoma: psammoma body

Papillary Carcinoma: The Little Orphan Annie Tumor
- Often affects younger women
- Tends to stay around for years without getting any bigger
- Is usually well-behaved; seldom kills people
- Has nuclei that resemble Orphan Annie’s eyes
- Has psammoma bodies (from the Greek *psammos*, or sand) - Annie’s dog is named Sandy

Follicular Thyroid Carcinoma
- Second most common type
- Young patient with small, minimally invasive tumor: 95% 10y survival
- Prognosis worsens with increasing age, tumor size, and invasiveness

Follicular thyroid carcinoma: vascular invasion

Medullary Thyroid Carcinoma
- Rare
- Endocrine tumor (of C cells)
- Confined to thyroid: 90% 10y survival
- Distant mets: 20% 10y survival

Medullary thyroid carcinoma
Anaplastic Thyroid Carcinoma

- Rarest type
- Bulky, fast-growing, invasive neck mass
- Usually metastatic at diagnosis
- Very bad prognosis (<10% 5y survival)

Anaplastic thyroid carcinoma