Neck Content
(Effective February 2007)
(1%-3%)

Anatomy
• located in the anterior neck at the level of
  the hyoid cartilage
• right lobe, left lobe, and isthmus.
• Each lobe → posterolaterally to the carotid
  artery and internal jugular vein and lateral
  to trachea.
• Lobes equal size - 5 to 6 cm in length and
  2 cm in the anteroposterior measurement

Blood supply
• Two superior thyroid arteries
  – from the external carotid arteries and
descend to the upper poles.
• Two inferior thyroid arteries
  – from the thyrocervical trunk of the subclavian
  artery and ascend to the lower poles.
Laboratory values

- With synthesis, storage, and secretion of thyroid hormones it
  - maintains normal body metabolism,
  - growth
  - development
Production of thyroid hormones occurs via iodine metabolism.

Laboratory values

- With synthesis, storage, and secretion of thyroid hormones it
  - maintains normal body metabolism,
  - growth
  - development
Production of thyroid hormones occurs via iodine metabolism.

Laboratory values

- Tests of Thyroid Function
- Nuclear medicine is used.
  - I123 uptake and scan
- It can measure T3 or T4 in the blood
Laboratory values

- With synthesis, storage, and secretion of thyroid hormones it
  - maintains normal body metabolism,
  - growth
  - development

Production of thyroid hormones occurs via iodine metabolism.

Technique

- longitudinal plane
  - Lateral, mid, and medial parts of each lobe are examined
- transverse plane
  - Superior, mid, and inferior portions of each gland are examined
- Transverse and longitudinal images of the isthmus

Muscles Ψ

- Strap muscles sternothyroid, sternohyoid, and omohyoid are also situated anterolateral to the thyroid gland.
- sternocleidomastoid is situated anterolateral to the thyroid gland.
- longus colli muscle is posterior and lateral to each thyroid lobe
  - appears as a hypoechoic triangular structure adjacent to the cervical vertebrae.
**Indications**

*(including clinical symptoms, clinical correlation and associated complications)*

- determine the nature of a nodule
- Single or multiple
- Solid or cystic
- Complex or calcified
- Unilateral
- Bilateral

---

**Nodular Thyroid Disease**

*Goiters*

Enlargement of the thyroid gland is termed *goiter*

- Types
  - Nodular hyperplasia
  - nontoxic simple
  - toxic multinodular goiter
  - adenomatous hyperplasia
- result of hyperplasia or neoplasia, or may be an inflammatory process.

---

**Nontoxic Simple Goiter**

- diffuse thyroid enlargement
- formed when gland is unable to provide an adequate supply of thyroid hormone.
- first stage, hyperplasia occurs;
- second stage, colloid involution occurs
- asymmetric and multinodular with hemorrhage and calcification
**Toxic Multinodular Goiter**

- most common forms of thyroid disease
- can be the end stage of diffuse nontoxic goiter.
- focal scarring, ischemia, necrosis, and cyst formation.
- adenomatous hyperplasia may demonstrate halos
- Calcifications and cystic areas may be present

---

**Graves’ Disease**

- related to an autoimmune disorder
- ↑ women > than 30
- characterized by thyrotoxicosis – frequent cause of hyperthyroidism.
- Clinical manifestations - hypermetabolism, diffuse toxic goiter, exophthalmos
- Thyrotoxic crisis, or thyroid storm
- Doppler shows increased vascularity.

---

**Thyroiditis**

- swelling and tenderness
- infection or related to autoimmune abnormalities.
- the gland appears enlarged and hypoechoic.
- may have an irregular surface.
• Hashimoto’s Thyroiditis
  – Chronic inflammation
  – form of autoimmune thyroiditis
  – sonographic examination- decreased and inhomogeneous echogenicity

• Hypothyroidism
  – hypometabolic state ↓ hormone secretion
  – lethargy, sluggish reactions, and a deep, husky voice.

### Benign Lesions

Thyroid Cysts
  – represent cystic degeneration of a follicular adenoma

Adenoma
  – complete fibrous encapsulation of a benign thyroid neoplasm
  – Imaging appearance vary widely

### Malignant Lesions

• Carcinoma is rare
• solitary nodule may be malignant in 10% to 25% of cases
• Calcifications are present in 50% to 80% of all types of thyroid carcinoma
Papillary Carcinoma

- Most common
- Metastatic cervical adenopathy occurs in 20% of patients
- usually a solitary mass
- irregular, firm, nodular enlargement

Malignant Lesions

- Follicular Carcinoma
- Medullary Carcinoma
- Anaplastic (Undifferentiated) Carcinoma
- Lymphoma
  - Non-Hodgkin's type

Anatomy of the Parathyroid Glands

- four small endocrine glands - important in the metabolism of calcium
- Two lie posterior superior poles
- Two lie posterior to the inferior pole.
- Enlarged glands - greater than 5 mm
  - decreased echo texture
  - appear as elongated masses between the posterior longus colli muscle and the anterior thyroid lobe.
Primary Hyperparathyroidism

- state of increased function
- Women 3x more like than men
- characterized by
  - hypercalcemia \( \Psi \) hypercalciuria, and low serum levels of phosphate.

Primary Hyperplasia

- Only one gland may enlarge
  - glands rarely > 1 cm in size.
- Adenoma
  - most common cause of primary hyperparathyroidism.
  - benign and < 3 cm.
  - encapsulated with discrete border
Infection

Abscess
– primarily fluid-filled to completely echogenic.
– Most common low-level echogenicity with rather irregular walls.
• Adenopathy
– Low-level echogenicity of well-circumscribed masses
– Follows specific chains

Lymph nodes
Benign and Malignant