

JoVE: Science Education
Thyroid Examination
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Overview

The thyroid gland is located in the neck anterior trachea between the cricoid cartilage (above) and the suprasternal notch (below) (**Figure 1**). It consists of a right and left lobe connected by an isthmus. The isthmus covers the second, third, and fourth tracheal rings, and the lobes curve posteriorly around the sides of the trachea and esophagus. The normal gland, weighing 10 – 25 g, is usually invisible on inspection and often difficult to palpate. A goiter is an enlarged thyroid from any cause. In addition to assessing its size, it is important to palpate the thyroid for its shape, mobility, consistency, and tenderness. A normal thyroid is soft, smooth, symmetrical, and non-tender, and it slides upward slightly when swallowing. Symmetrical enlargement of a soft, smooth thyroid suggests endemic hypothyroidism due to iodine deficiency or one of two prevalent autoimmune disorders: Graves' disease or Hashimoto's thyroiditis. Thyroid nodules are common and usually incidental; however, 10% turn out to be malignant. They may be single or multiple, and are most often firm and non-tender. A tender, symmetrical goiter typically indicates thyroiditis.

Thyroid disease rarely manifests as a palpable goiter in isolation. Thyroid hormones serve to maintain homeostasis primarily by stimulated cellular metabolism throughout the body. Hyperthyroidism, therefore, is associated with symptoms of increased metabolism: sweating, weight loss, anxiety, palpitations, loose stools, heat intolerance, irritability, fatigue, weakness, and menstrual irregularity. Physical exam findings may include tachycardia; warm, moist skin; lid lag; tremor; and rarely, an overlying bruit detectable on auscultation. Hypothyroidism tends to have the opposite manifestations: weakness, fatigue, cold intolerance, constipation, weight change, depression, menorrhagia, and hoarseness. Physical exam findings may include bradycardia, dry skin, and delayed return of deep tendon reflexes. It is important to note that goiters may be euthyroid (normal thyroid hormone levels), hyperthyroid, or hypothyroid. Headaches or visual disturbances may suggest a secondary thyroid disorder due to a pituitary adenoma.

Procedure and Representative Findings

1. Inspection.

1.1 Tip the patient's head slightly back, and carefully inspect the anterior neck. If visible, the thyroid appears between the cricoid cartilage and suprasternal notch. Check for symmetry, diffuse swelling, and obvious masses.

1.2 Have the patient swallow, and observe as the cricoid cartilage, thyroid cartilage, and thyroid gland move up and down.

2. Palpate.

Although the thyroid can be palpated from either anterior or posterior positions, the latter approach is traditional.

2.1 Ask the patient to slightly flex their neck to relax the sternomastoid muscles.

2.2 From behind the patient, reach around with both hands and use your fingers to identify the landmarks from top to bottom: mobile hyoid bone just beneath the mandible, thyroid cartilage with its superior notch, cricoid cartilage, tracheal rings, and suprasternal notch (**Figure 1**).

2.3 Place your index fingers just below the cricoid cartilage.

2.4 Ask the patient to swallow as before, and feel for the thyroid isthmus rising up under your finger pads. It is not always palpable. Feel for size, shape, and consistency, noting any nodules or tenderness.

2.5 Using the fingers of your right hand, gently move the trachea to the left and feel for the right lobe in the space between the trachea and sternomastoid muscle.

2.6 Similarly examine the left lobe.

2.7 If a goiter is detected, listen for a bruit by placing the stethoscope over the lateral lobes.

Summary

An enlarged thyroid gland, or goiter, is most often associated with normal thyroid gland function (euthyroid), but may be associated with hyper or hypothyroid conditions. Any thyroid abnormality found on physical examination, therefore, should prompt a careful evaluation for the systemic signs and symptoms associated with both high and low thyroid hormone levels. A normal thyroid can be difficult to palpate, particularly in patients with large necks. Its location, however, can be precisely determined by identifying the bony and cartilaginous landmarks nearby: cricoid cartilage above and the suprasternal notch below. In addition to an increase in size, the gland may show asymmetry, nodularity, or tenderness. Symmetrical goiters and thyroid nodules are not uncommon, and their detection should always prompt further investigation.

Figures and legends

Figure 1: Anatomy of the thyroid gland.

A drawing illustrating the location and anatomy of the thyroid gland with respect to the neck structures.

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