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**Specialty :** Thyroid

**Lecture Title :** Ultrasound Anatomy of the Neck: Thyroid and Parathyroid

**PT\_No. :** LD02-S1

A comprehensive understanding of thyroid and central neck anatomy is essential for accurate imaging interpretation, safe intervention, and surgical planning. The thyroid gland has an H- or U-shaped configuration, composed of two lateral lobes connected by an isthmus. The isthmus is typically located anterior to the first to third tracheal rings, with the superior margin corresponding to the oblique line of the thyroid cartilage and the inferior margin at the level of the fourth to fifth tracheal rings. The gland normally weighs 15–35 g, with size variations depending on age, sex, and physiologic conditions such as pregnancy.

The thyroid is located in the infrahyoid neck and is surrounded by important anatomical structures. Anteriorly, it is covered by the strap muscles, while laterally it is bordered by the carotid sheath containing the common carotid artery, internal jugular vein, and vagus nerve. Posteriorly, the trachea and esophagus are present, with the recurrent laryngeal nerve (RLN) coursing along the tracheoesophageal groove. The longus colli muscle and cervical vertebrae are located posteriorly, and the scalene muscles and brachial plexus are positioned laterally. On ultrasonography, the thyroid gland demonstrates homogeneous echogenicity higher than adjacent muscles and is delineated by a thin echogenic capsule. Anatomical variations are common and clinically relevant. The pyramidal lobe, a remnant of the thyroglossal duct, is present in a substantial proportion of individuals and may become more prominent in diffuse thyroid disease. The Zuckerkandl tubercle, a posterior projection of normal thyroid tissue, serves as an important surgical landmark but may mimic a thyroid nodule or parathyroid lesion on imaging.

The thyroid gland receives arterial supply from the superior thyroid artery (branch of the external carotid artery) and the inferior thyroid artery (branch of the thyrocervical trunk). A thyroid ima artery may be present in a minority of cases. The RLN, a branch of the vagus nerve, ascends along the tracheoesophageal groove and innervates most intrinsic laryngeal muscles. Its anatomical course is variable, and rare variants such as the non-recurrent laryngeal nerve may be associated with vascular anomalies. In addition, the middle cervical sympathetic ganglion, located anterior to the longus colli muscle, may mimic a lymph node on imaging and should be recognized to avoid misinterpretation and procedural complications. Lymphatic drainage differs according to the location within the thyroid. The upper portions drain to the superior deep cervical and prelaryngeal lymph nodes, whereas the lower portions drain to the pretracheal, paratracheal, inferior deep cervical, and superior mediastinal lymph nodes.

The normal parathyroid glands are small, ovoid structures typically located along the posterior aspect of the thyroid gland. Superior parathyroid glands are relatively constant in position, usually near the tracheoesophageal groove, whereas inferior glands show more variable locations, ranging from the lower thyroid pole to the thymic tissue.