

THYROID, PARATHYROID, CALCIUM HOMEOSTASIS, AND BONE PHYSIOLOGY

THYROID

Surgical Anatomy and Embryology

The anlage of the thyroid gland first appears embryologically at 3 to 4 weeks of development as a thickening in the epithelium of the floor of the pharyngeal gut. This anlage subsequently enlarges and migrates caudally into the neck. The remanent of this descending anlage is the thyroglossal duct which normally obliterates by the end of the second month. Its point of origin remains as the foramen cecum at the base of the tongue. As the anlage descends it acquires cells from the ultimobranchial body which become parafollicular cells in the thyroid and ultimately secrete calcitonin.

Failure of the thyroid anlage to develop leads to the rare congenital absence of the thyroid gland which can produce cretinism. If the anlage is arrested in its course, an abnormal thyroid may develop wherever the arrest occurs. This may be at any point from the epithelium of the tongue to the normal location in the neck. Such thyroids are called lingual thyroids.

FIGURE 1

The thyroid gland in the adult weighs about 20 grams and is the largest of the endocrine organs. It consists of two lateral lobes connected by an isthmus and has the gross configuration of a butterfly. A third, parametal, lobe commonly exists near the midline. It is a remanent of cells from the lower part of the thyroglossal ducts.

Figure 1

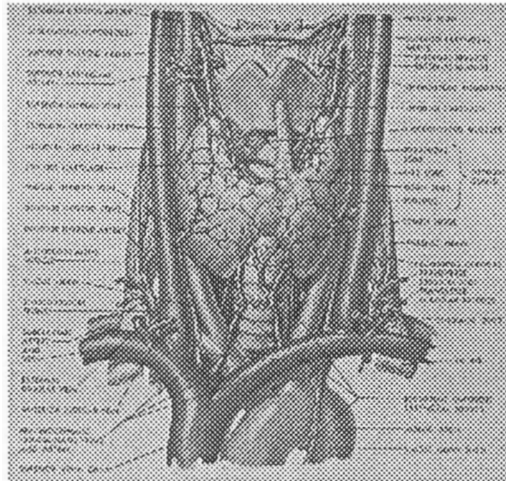


Figure 2
Thyroid Blood Flow

Normal 4-6 ml/G/min

20 G x 6 = 120 ml/min

Thyrotoxicosis - 1000 ml/min