

## DEXTRITY AND THYROID DOMINANCE

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### Abstract

Sonography may reveal the dominance of dexterity during the second trimester of intrauterine pregnancy [9]. According to research, the right thyroid lobe typically dominates the left. Using CT and isotope scans, the author observed that thyroid lobes predominated in the 1970s and 1980s. He noticed that left-handed people have a dominant left thyroid lobe, while right-handed people have a larger dominant right thyroid lobe. We are unable to evaluate this trait because ambidextrousness is uncommon by birth. We conducted research to determine the cause of the thyroid lobes' dominance and dexterity.

Keywords: Ambidextrous, Thyroid Lobes, Dominance, and Dexterity

### Introduction

The thyroid gland is a vital component of the endocrine system, weighing between 15 and 20 grams. The term "thyroid" is derived from the Greek word "thyreodis," meaning large oblong shield, combined with "Khondros," which signifies a resemblance. This nomenclature is attributed to the Greek shield's design, which featured a notch for the chin, paralleling the appearance of the thyroid cartilage in the neck, historically referred to as "thyreoid cartilage" (with the "e" later omitted). Initially termed the "laryngeal gland," it was reclassified as the "thyroid gland" by Thomas Wharton in 1646. Anatomically, the thyroid gland is situated in the anterior neck, extending from the C5 to T1 vertebrae. It is an endocrine gland composed of two lobes connected by an isthmus, positioned posterior to the sternohyoid and sternothyroid muscles, encircling the cricoid cartilage and the superior tracheal rings. It is located inferior to the laryngeal thyroid cartilage and resides within the visceral compartment of the neck, alongside the trachea, esophagus, and pharynx, all encased by pretracheal fascia. The glandular capsule consists of both internal and external thyroid folium. During embryonic development, the thyroid gland originates in the floor of the primitive pharynx, near the base of the tongue, and subsequently descends to its definitive anatomical location. In 1500 AD, Andreas Vesalius provided the first anatomical description and illustration of the thyroid gland, while Leonardo da Vinci was the first to recognize and depict it in the same year. Characterized by a brownish-red hue, the thyroid is highly vascularized. Additionally, nerves essential for vocal quality traverse behind and laterally to the gland. The thyroid is responsible for the secretion of various hormones, collectively known as thyroid hormones, with thyroxine, or T4, being the primary hormone. These hormones exert influence throughout the body, affecting metabolism, growth and development, as well as regulating body temperature. Sufficient levels of thyroid hormone are particularly critical for brain development during infancy and childhood. Notably, the thyroid gland is the first endocrine gland to form, emerging around the 24th day of gestation.

### Functions:

The primitive pharynx and the neural crest. The lateral thyroid, which is in its early form, arises from neural crest cells, whereas the median thyroid, which constitutes the majority of the gland, originates from the primitive pharynx. The formation of the thyroid gland occurs through the proliferation of endodermal epithelial cells located on the median surface of the developing pharyngeal floor. This developmental site is situated between two significant structures, the tuberculum impar and the copula, and is referred to as the foramen cecum. Regarding the blood and nerve supply to the thyroid gland: The thyroid receives its arterial blood supply from the superior thyroid artery, a branch of the external carotid artery, and the inferior thyroid artery, which branches from the thyrocervical trunk. Occasionally, an anatomical variant known as the thyroid ima artery may also contribute, with its origin varying. The superior thyroid artery divides into anterior and posterior branches that supply the gland, while the inferior thyroid artery bifurcates into superior and inferior branches. These arteries converge behind the outer portions of the thyroid lobes. Venous drainage is facilitated by the superior and middle thyroid veins, which empty into the internal jugular vein, as well as by the inferior thyroid veins. The inferior thyroid veins arise from a network of veins and drain into the left and right brachiocephalic veins. Both the arterial and venous systems create a plexus between the two layers of the thyroid gland's capsule. Functions: Thyroid hormones exert influence on nearly every cell within the body. They serve to elevate the basal metabolic rate, impact protein synthesis, assist in the regulation of long bone growth in conjunction with growth hormone, and enhance the body's responsiveness to catecholamines, such as adrenaline, through permissiveness. These hormones are crucial for the proper development and differentiation of all human cells. Additionally, they regulate the metabolism of proteins, fats, and carbohydrates, thereby influencing how human cells utilize energetic compounds.

### Materials and Methods

We conducted an analysis of 532 thyroid scintigraphy studies. Upon reviewing these 532 thyroid scintigram images, the authors noted the predominance of the thyroid lobes in terms of anatomy, physiology, and pathology. The gland's size, both in weight and volume, was assessed, revealing that the right lobe is larger than the left, a fact already documented in textbooks. This raises the question of why the right lobe exhibits dominance over the left. In our analysis of these 532 scans, we explored whether the dominance of either lobe is established during intrauterine life, as evidenced by the hand preference observed in fetuses, who often favor either the right or left hand. This trait appears to be hereditary. We included several cases of left-handed individuals, whose thyroid scintigraphy indicated a corresponding dominance of the left lobe.

### Results:

**Table 1:**

Sl. No.:	Details	Male (No. of cases)	Female (No. of cases)
1	Total Number of cases Taken for study	20.3 %	79.7 %
2	Left lobe dominance	15 %	7.3 %
3	Right lobe dominance	84.2 %	89.6 %
4	Unequivocal		13
4	Cold nodule	20	30
5	Hot nodule	4	3
6	Non-functioning thyroid lobes (Left)	-	5
7	Non – functioning thyroid lobes (right)	-	2
8	Less uptake	1	-

9	Thyroidectomy	-	1
10	Hemithyroidectomy	-	1
11	Hashimotos Syndrome		1
12	Faintly Visualized	2	1 (Right lobe)
13	Mass lesions on left thyroid lobe	1	-
14	Mass lesions on right thyroid lobe	1	-
15	Midline Thyroid	1	

Table No.1: shows the scintigraphic analysis of the thyroid gland based on the uptake in 532 cases totally

Figure 1 & 2: Scintigraphy of normal thyroid shows the dominance of the thyroid lobes respective to the dexterity.

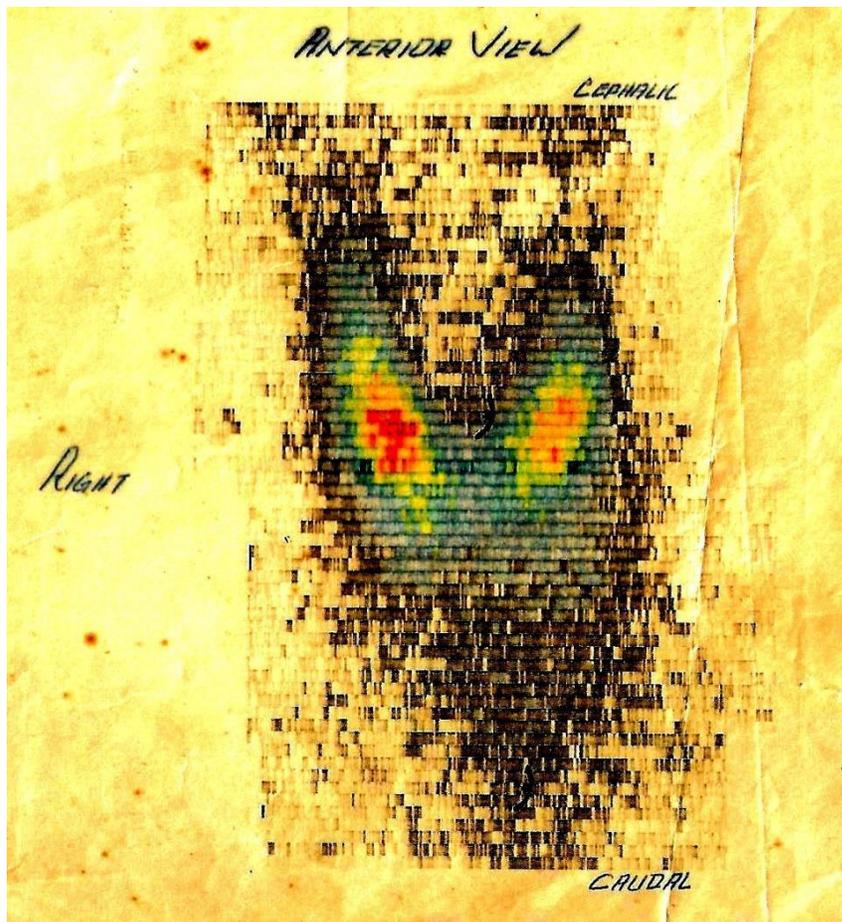


Figure.1

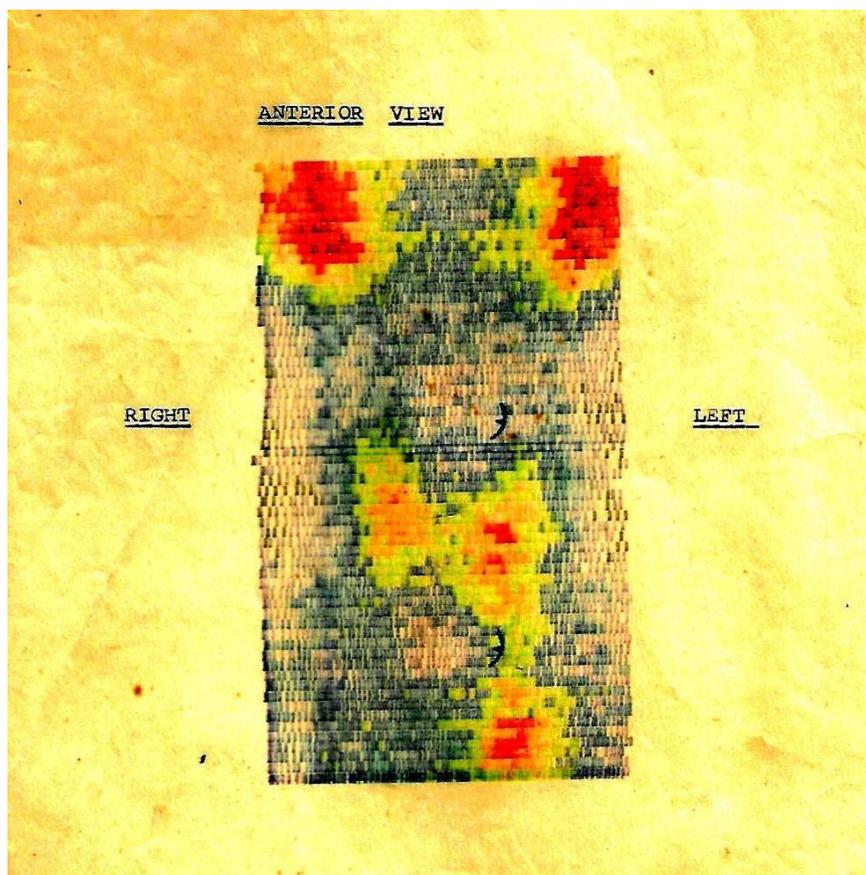


Figure.2

This observation prompted further investigation into the vascular supply of the region, specifically the brachiocephalic blood supply. We examined the dominance of this vascular supply through MR angiography in both groups. Additionally, we found that the dominant lobe exhibited a higher uptake of isotopes, as measured by count. We also referenced studies conducted by other research groups that have addressed similar issues. They employed sonology as their primary tool and reported findings of left lobe dominance. In light of this, we aimed to replicate their study using sonographic techniques, positioning patients on their right and left sides. Our findings revealed discrepancies, leading us to conclude that scintigraphy, along with contrast CT and MR angiography, are the most effective tools for this type of analysis.

### Conclusion:

The findings indicate that, contrary to textbook descriptions, the dimensions of the thyroid lobes were greater on the sides corresponding to the individuals' dominant hand. It can also be inferred that this may be attributed to increased blood supply on those particular sides. Further research will be conducted on all paired organs in relation to their respective dexterity.

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