

# Morphology and Histogenesis of Human Fetal and adult Thyroid Gland

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## ABSTRACT

In human beings thyroid gland is one of the most important endocrine gland. It is differentiated at early embryonic life and has important role in human development. Thyroid gland regulates metabolic rate, psychological development and somatic development. The ability of the human fetal thyroid gland to concentrate iodide and to synthesize thyroid hormones thus seems to be linked to the organization of follicles. Anomalies of thyroid gland like agenesis of are thymus can be diagnosed via CT, MRI and the results provides the ultrasound importance for the radiologists to prevent both maternal and fetal complications to avoid further invasive procedures.

**Key words:** Anomalies, Isthmus, Follicles

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## INTRODUCTION

Thyroid hormones are necessary for regulating the body metabolic rate, body temperature, calcium metabolism, somatic and circadian rhythm. The organogenesis of thyroid gland in human is often disturbed, leading to a variety of morphological variations such as hypoplasia, ectopy, agenesis etc. These anomalies may lead to various thyroid illnesses and clinical disorders [1-4]. Congenital hypothyroidism is the most common disorder of the endocrine system among new-borns. We intend to study the morphological changes of the thyroid gland at different gestational weeks in human foetuses and in adult and also to document the microscopic structure of thyroid gland at different gestational age groups and also in adult.

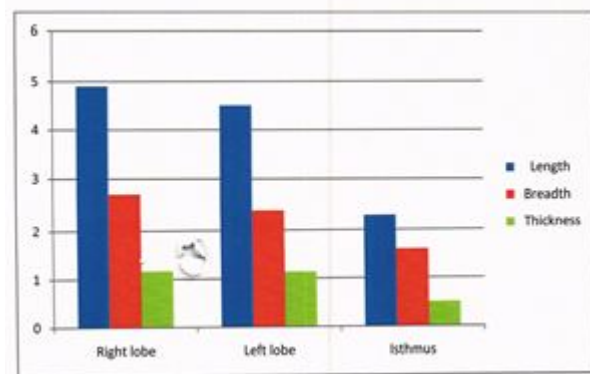
## METHODOLOGY

Thirty three human foetuses (16 males and 17 females) of different age groups ranging from 10 to 39th gestational week. Morphological parameters such as length, width and size were ascertained and also the histopathological studies were done on the collected samples.

## RESULTS

The morphological studies revealed that level of superior poles of thyroid lobe were located between the upper  $\frac{1}{2}$  and lower  $\frac{1}{2}$  of the thyroid cartilage in group 1 samples. Thyroid gland was found to be normal in position and dimensions in group 2 cases. In the group 3 category the

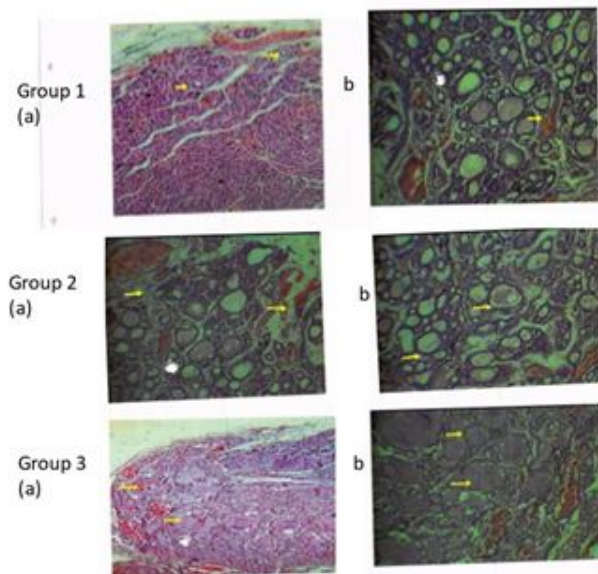
distance between superior poles of thyroid gland and the hyoid bone increases throughout the fetal period as depicted in Figure 1.



**Figure 1: Comparisons of dimensions of the lobes of thyroid gland and isthmus.**

The histopathological results explains that human fetal thyroid (12wks) showing ptheriperal differentiation of the follicles with increase vascularity in group 1 (a) and in group 2 samples it was seen that thick connective septa along with blood vessels invading the glands in 20weeks also increase in size of the follicles (Group 2A & 2B).

Matured thyroid follicle filled colloid and increased vascularity seen in 30 weeks also with densely stained colloid was seen in group 3 cases.



**Figure 2: Histological observations.**

### DISCUSSION AND CONCLUSION

The study of morphology and Histogenesis of human fetal thyroid gland gives us insight into the growth and differentiation of the gland and for better understanding of the developmental anomaly. Anomalies of thyroid gland like agenesis of isthmus can be diagnosed via CT, MRI and ultrasound [3-10]. Proper identification of vessels is very important in order to avoid major complications. Hence a thorough knowledge of the thyroid anatomy and its associated anatomical variations is very much essential, so these anomalies are not overlooked in the different diagnosis. This analysis could be of great importance for the radiologists to prevent both maternal and fetal complications to avoid further invasive procedures.

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