NOTE ON THE ISTHUMUS AND ACCESSORY THYROID TISSUE OF POST-NATAL THYROID GLAND (0-90 days) IN ASSAM GOAT (CAPRA HIRCUS)

G. BAISHYA, S. AHMED and M. BHATTACHARYA
Department of Anatomy and Histology,
College of Veterinary Science, Assam Agricultural University,
Khanapara, Guwahati-781 022.

Roy et al., (1975) studied the histomorphology of isthmus and accessory thyroid tissue in goat. Studies on accessory thyroid tissue were reported by Sisson (1967) in goat, Sisson and Grossman (1970) in sheep, horse and dog, and Roy and Yadava (1975) in buffalo. However, very scanty information is available in the literature about biometry and age changes of isthmus particularly during post-natal life. The present study was undertaken with a view to detail out the changing pattern of isthmus and accessory thyroid tissue of kids during post-natal life ranging from zero to ninety days of age.

MATERIALS AND METHODS

Twelve apparently healthy Assam male goats aged from zero to ninety days were utilized in this study. All these animals were reared under identical managerial system. The animals were divided into four groups of three each with different phases of post-natal development viz. from birth to fifteen days, sixteen to thirty days, thirty one to sixty days, and sixty one to ninety days.

Isthmuses and accessory thyroid tissue were collected from the goats of different age groups after killing the animals by ether asphyxia. The transverse length and width of the isthmuses were measured. For studying the histological characteristics, the isthmuses and accessory thyroid tissue were fixed in 10% buffered neutral formalin and Helly's fluid, and processed for paraffin sectioning. Later, the paraffin sections (4 μm) were stained by Mayer's H. & E., Mallory's method for collagen, Hart's method for elastic fibers and Gomori's method for reticulum as per Luna (1968).

RESULTS AND DISCUSSION

The present study revealed that the thyroid gland consisted of two lateral lobes connected by a narrow isthmus in all the animals of different age groups (Fig. 1). Isthmus was not observed in all the thyroids of guinea pigs (Latimer, 1951) and goats (Roy et al., 1975). The location of isthmus in relation to ventral surface of tracheal rings varied in different species of animals (Getty, 1975). It has been observed that the location of isthmus in relation to tracheal rings
Fig. 1 Showing the location and outline of thyroid gland in relation to tracheal rings in a twenty six day-old kid.

Arrow marks isthmus

varied from fifth to ninth in different animals. Correlation in regard to location of isthmus on the tracheal rings with the advancing age could not be evolved as reported by Roy et al., (1975). Mean length of the isthmuses was 1.17, 1.23, 1.27 and 1.9 cm; and that of width 0.22, 0.11, 0.17 and 0.17 cm respectively for the four groups of animals according to advancing age. Information on this aspect of isthmus could not be found in available literature.

The accessory thyroid tissue attached to caudal end of the left lobe was found only in kid number ‘0’ (Fig. 2). Accessory thyroids were observed in goat (Sanson, 1967), sheep, horse, dog (Sisson and Grossman, 1970) and buffalo (Roy and Yadava, 1975). Roy et al., (1975) demonstrated the accessory thyroid tissue attached to the left lobe only in one out of fifteen goats, and almost similar finding was recorded in the present study.
Fig. 2  Showing the Accessory thyroid tissue (a) of two day-old kid.

Fig. 3  Microphotography of accessory thyroid tissue showing the relatively more reticular fibers in the capsule and trabeculae as compared to main thyroid gland. Gomori's method $\times 140$
The accessory tissue was found to be invested by a thin capsule. The capsule contained more collagenous fibers in comparison to those of septae and interfollicular connective tissue. Elastic fibers predominated in blood vessels. Reticular fibers were mainly distributed in interfollicular connective tissue, but found to be more in capsule and septae in comparison to main thyroid gland (Fig 3). Follicles of different developmental phases showed a definite pattern of distribution—smaller ones to the periphery while larger ones towards the centre. The lining epithelium was mostly simple cuboidal along with simple squamous epithelium. The follicles with acidophilic colloid were distributed centrally whereas few follicles with basophilic and mixed varieties were distributed at the periphery of the gland. Certain follicles lacked colloid.

The investing capsule of isthmus was thicker and branching of the same was not evident. Accumulation of large cells with lightly stained nuclei of variable shapes could be observed occasionally in the interfollicular connective tissue. Cellular outlines of these cells could not be ascertained. However, cellular cytoplasm was eosinophilic. These cells may be considered as the stem cells. Lining epithelium of certain follicle showed discontinuity. Vacuoles were mostly marked in the colloid. Also presence of degenerated cells in the colloid mass was observed mostly in the follicles distributed centrally. These variations of accessory thyroid tissue and isthmus of goat thyroid from the main glandular tissue in this study could not be found in the available literature. However Roy et al., (1978) could not find any structural difference between these tissues from main thyroid gland. Further, these workers indicated replacement of glandular characteristics of isthmus by fibrous tissues in aged animals. This replacement could not be seen in the present study probably due to its limitation within the younger animals.

**SUMMARY**

Isthmuses from twelve Assam goats of four different age groups ranging from zero to ninety days, and the accessory tissue were studied. The glandular isthmus connected the lateral lobes at or near their caudal extremities in all the animals, and was located opposite 5th to 9th tracheal rings. An increasing average length of isthmus with the advancing age was marked. Accessory thyroid tissue was recorded in only one two-day-old kid. The histology and histochemistry of the accessory thyroid tissue and isthmus is discussed.

**REFERENCES**


