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Case Report

Agenesis of Isthmus of Thyroid Gland – A Cadaveric Study

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Key Words: isthmus, agenesis of thyroid isthmus, congenital absence of isthmus

Abstract: The thyroid gland is an endocrine gland, situated in the lower part of the front and sides of the neck. The gland consists of right and left lobes that are joined to each other by Isthmus lying anterior to the second, third and fourth tracheal rings. A number of morphological variations and developmental anomalies of the thyroid gland have been reported (Dixit D *et al*., 2009). In this study, an absence of the Isthmus of thyroid gland is observed. The incidences of agenesis of Isthmus, along with the developmental and clinical significance are discussed.

The thyroid gland, brownish red and highly vascular, placed anteriorly in the lower neck consist of right and left lobes connected by a narrow median Isthmus. The Isthmus of thyroid gland measures 1.25 cm transversely and vertically (Standring *et al*., 2005). Absence is quiet rare in humans. The incidence of agenesis of the thyroid isthmus has been reported to vary from 5 - 10 % by Pastor *et al*., (2006) and from 8-10% by Marshall (1895). The knowledge of various developmental anomalies of the gland and variation in vascular relations will help the surgeon in better planning of a safe surgery.

Case Report

During the routine dissection at SRM medical college, absence of isthmus of thyroid gland was noticed. The thyroid isthmus connects the lower parts of the lobes anterior to the tracheal cartilages. In the present study the isthmus is absent, only tracheal rings observed and along the lateral side conical shaped thyroid lobes observed. The superior thyroid artery branch of the external carotid artery runs downwards and reached the upper pole of the lobe and it divided into anterior and posterior branches. The anterior branch descends on the anterior border of the lobe and anastomosed with a branch from the inferior thyroid artery. There is no anastomosis of anterior branch of superior thyroid artery with its fellow of the opposite side. The posterior branch of superior thyroid artery anastomosed with the ascending branch of the inferior thyroid artery. The inferior thyroid vein lies on the tracheal rings in the place of thyroid isthmus; they formed a plexus and drained into the left brachiocephalic vein. Knowledge of this type of variations gives a surgeon to avoid major complications.

Discussion

Agenesis of the thyroid isthmus is the complete and congenital absence of the thyroid isthmus. During development, the thyroid gland appears as an epithelial proliferation in the floor of the pharynx between the tuberculum impar and the copula and a point later indicated by the foramen caecum. The thyroid descends in front of the pharyngeal gut as a bilobed diverticulum. During this migration, the thyroid remains connected to the tongue by a

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narrow canal, the thyroglossal duct, which disappears later, then descends in front of the hyoid bone and laryngeal cartilages and reaches its final position in front of the trachea in the seventh week. By then, it has acquired a small median isthmus and two lateral lobes (Sadler, 2010). Sometimes during this development only two lateral lobes are formed without median isthmus which results in agenesis of thyroid isthmus. The absence of the isthmus can be associated with dysorganogenesis (Schanarder and de oliveire, 2008). This agenesis may be because of high division of the thyroglossal duct giving rise to two independent thyroid lobes with absence of isthmus (Schanarder and de oliveire, 2008). Clinically the diagnosis of agenesis of the isthmus can be done with scintigraphy. The diagnosis can also be done with ultrasonography, computerized tomography (CT), Magnetic resonance imaging (MRI) (Sadler, 2010).

Fig. 1 Photograph showing absence of isthmus

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