ORIGINAL RESEARCH PAPER
VOLUME-6 | ISSUE-7 | JULY-2017 | ISSN No 2277 - 8179 | IF : 4.176 | IC Value : 78.46
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

PYRAMIDAL LOBE OF THYROID: A COMMON CONGENITAL ANOMALY

Anatomy

Dr Vijay Laxmi Associate Professor Department of Anatomy, Government Medical College, Amritsar, Punjab, India

Dr Kulbir Kaur Senior Resident Department of Anatomy, Government Medical College, Amritsar, Punjab, India - Corresponding Author

Dr Ravikant Sharma Professor & Head Department of Anatomy, Government Medical College, Amritsar, Punjab, India

ABSTRACT

Material and Method: The material for the study comprised of thirty properly embalmed adult human cadavers of either sex procured from the Department of Anatomy, Government Medical College, Amritsar.

Aim: The main aim of the study was to identify the variations in location, shape and size of pyramidal lobe. Knowledge of these variations is important for planning and conducting surgical procedures on the thyroid gland.

Results and Conclusion: The pyramidal lobe was present in 12(40%) cases. It was located on left side in 8(66.6%) cases, on right side in 2(16.7%) and median in 2(16.7%) cases. The pyramidal lobe was quadrangular in 9(75%) and triangular in 3(25%) cases. The mean length of the pyramidal lobe was 2.3cm ranging from minimum 1.0cm to maximum 4.6cm. Since the pyramidal lobe is a normal component of thyroid gland, of varying position and size, it should always be examined during thyroid surgery and mandatorily removed in total and subtotal thyroidectomies.

KEYWORDS:

Pyramidal lobe, Anatomy, Thyroid gland.

INTRODUCTION

Pyramidal lobe is a small conical process which may project upwards from the isthmus or from the adjacent part of the lateral lobes of thyroid gland towards the hyoid bone. It is occasionally detached from the gland or may be divided into two or more parts [1].It may be attached by connective tissue to the hyoid bone or the front of thyroid cartilage. The pyramidal lobe, if well developed receives a special branch from the superior thyroid arteries, usually the left. It may undergo hypertrophy as a result of various disorders, as does the rest of the gland, and may be readily palpable because of its superficial location. An enlargement of the pyramidal lobe may penetrate into the mediastinum as a retrosternal or plunging goiter. If interposed between the sternum and trachea, it may cause pressure over the trachea leading to suffocation [2].

MATERIALAND METHODS

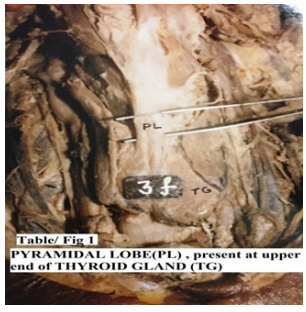
Thirty properly embalmed adult human cadavers of either sex from the Department of Anatomy, Government Medical College, Amritsar formed the material for the study. The cadavers were labeled 1-30 and with suffix 'M' for male and 'F' for female.

The incisions on the neck for exposure of thyroid gland were given as shown in Cunningham's Manual of Practical Anatomy by Romanes (2000)[3].

Morphometric measurements of the lobes & the isthmus of thyroid gland were taken by making planes with the help of two scales and distance between two planes so made was measured with the help of divider on graduated metric scale. Location and shape of pyramidal lobe was recorded. The length of pyramidal lobe was measured between two horizontal planes, one passing along the upper border of the isthmus or the apex of the lobe where it starts and other at the level where it ends.

OBSERVATIONS

The pyramidal lobe was present in 12(40%) cases. It was located on left side in 8(66.6%) cases, on right side in 2(16.7%) and median in 2(16.7%) cases. The pyramidal lobe was quadrangular in 9(75%) and triangular in 3(25%) cases. The mean length of the pyramidal lobe was 2.3cm ranging from minimum 1.0cm to maximum 4.6cm.



Table/ Fig 1
PYRAMIDAL LOBE(PL) , present at upper end of THYROID GLAND (TG)

DISCUSSION

In the present study, the pyramidal lobe was found to be present in 12(40%) cases. The incidence of presence of pyramidal lobe as compared with previous workers is shown below:

Table/ Fig 2. PREVALENCE OF THE PYRAMIDAL LOBE IN THE LITERATURE

Author	Frequency (%)	Examination method	Examination year
Marshall[4]	43	On cadavers	1895
Sobotta[5]	45	On cadavers	1915
Hollinshead[6]	43	On cadavers	1954
Anson	40	Unknown	1966
Gardner[7]	40	On cadavers	1966
Hunt[8]	41	Surgical	1968
Blumberg[9]	60 – 65	Surgical	1981
Kitagawa[10]	48.6	On cadavers	1993
Foster[11]	80	Unknown	1995
Henry[12]	30	Unknown	1997
Present study	**40**	**On cadavers**	**2002**
Filho[13]	50.7	Surgical	2004
Harjeet[14]	28.9	On cadavers	2004
Braun[15]	55	On cadavers	2007
Sturniolo[16]	25.5	Surgical	2008
Geraci[17]	12	Surgical	2008

The findings of the present study are in accordance with the findings of Marshall (1895). Sobotta (1915), Hollinshead (1954), Anson (1966). Gardner (1966) and Hunt et al (1968) [4,5,6,7,8].

In the present study, the pyramidal lobe was found to be located on the left side in 8(66.6%) cases, on the right side in 2(16.7%) and was median in 2(16.7%) cases. Huber (1936),Romanes(1964), Anson (1966), Hunt et al (1968) and Healey & Seybold (1969) have also reported that the pyramidal lobe is most commonly present on the left side.

In the present study, the shape of the pyramidal lobe was found to be quadrangular in 9(75%) cases and triangular in 3(25%) cases. No comparable reference regarding shape is available in the accessible literature.

In the present study the mean length of the pyramidal lobe was found to be 2.3cm ranging from minimum of 1.0cm to maximum of 4.6cm. Fowler and Hanson (1929) have reported the length of the isthmus as varying between a small nipple to 5cm.

ONTOGENY

From an embryological point of view, thyroid tissue appears on the 24th day at the limit between the first and second brachial arch [18]

It appears initially as a thickening of the endodermic plaque at the floor of the pharyngeal rudiment and constitutes progressively a sac or thyroid diverticulum; initially loose, the diverticulum hardens progressively while the thyroid gradually migrates through the neck to reach its final position. During this passage, the thyroid remains closely adherent to the tongue through the thyroglossal duct. By the end of the seventh week of pregnancy, the thyroid has reached its position and adopted its adult form, losing its connection with the tongue, through duct degeneration, starting generally from its middle third, although the origin of thyroid primodium persists in the form of the foramen caecum of the tongue. During its descent, a portion of the thyroid tissue may persist along the axis of the thyroglossal duct or even continue the descent to the bottom. These residues are the basis of several thyroid abnormalities such as ectopic thyroid, lingual thyroid, cysts or fistulae of thyroglossal duct. The pyramidal lobe is the lower portion of the thyroglossal duct and can be adherent to the hyoid bone by fibrous or muscular cords [19,20].

CONCLUSION AND SUMMARY

Pyramidal lobe is an accessory structure of thyroid. It may vary in shape and position as well as appearance and size. Its direction is upwards in the midline or slightly to the left or right, depending on the position of origin on the upper border of isthmus. It may be attached to thyroid cartilage, by fibrous tissue. The origin can be on upper border of isthmus medial border of lateral lobes or the upper poles. Most of authors claim that the most frequent position (40-60%) of the pyramidal lobe origin is the left side of the isthmus or the left lobe of thyroid gland. These statements agree with data from our study, where the pyramidal lobe arose from left side in 66.6% cases. Since presence of pyramidal lobe is considered as normal component of thyroid gland so it should always be examined during surgery & mandatorily removed in total and subtotal thyroidectomies .

REFERENCES

1. Williams P L, Bannister LH, Berry M M, Collins P, Dyson M, Dussek JE and Ferguson MWJ: Gray's anatomy: In endocrine system, Ed. Dyson M, 38th Edn, Churchill Livingston, New York, 1995, pp 1515,1516,1535,1882, 1891, 1892, 1895,1897, 176.
2. Anson B J and Maddock W G: Callender's Surgical Anatomy. In : Anterior Regions of the Neck- Thyroid Region Eds. WB Saunders Company, Philadelphia, London, 1952, pp. 189-90 Gardner WU. The endocrine glands and unclassified organs. In: Anson BJ, ed.
3. Romanes GJ: Cunningham's manual of practical anatomy, 15th Ed., Vol. III, Head and Neck and Brain. In: The deep dissections of the neck. Oxford, New York, Tokyo, oxford University Press, 2000, pp. 64-68.
4. Marshall CF. Variations in the form of the thyroid gland in man. J Anat Physiol 1895;29:234-239.
5. Sobotta J. Anatomie der Schilddruese. In: Bardeleben's Handbuch der Anatomie des Menschen (in German). Jena: Verlag von Gustav Fischer, 1915:165-183.
6. Hollinshead W H: Anatomy for surgeons. The Head and Neck, Vol. I, 3rd Edn., A Hoeber- Harper book, 1954. Pp. 517-636.
7. Gardner WU. The endocrine glands and unclassified organs. In: Anson BJ, ed. Morris' Human Anatomy. 12th ed. London: McGraw-Hill, 1966:1547
8. Hunt PS, Poole M, Reeve TS. A reappraisal of the surgical anatomy of the thyroid and parathyroid glands. Brit J Surg 1968;55: 63-66.
9. Blumberg NA. Observations on the pyramidal lobe of the thyroid gland. S Afr Med J 1981;59:949-950.
10. Kitagawa W. Arterial supply of the thyroid gland in the human fetuses (in Japanese with English abstract). Nippon Ika Daigaku Zasshi 1993;60:140-155.
11. Foster RS. Thyroid Gland. In: Davis JH, Sheldon GF, eds. Surgery - A Problem Solving Approach, Vol 2. 2nd ed. St Louis: Mosby, 1995:2184.
12. Henry JF. Surgical Anatomy and Embryology of the Thyroid and Parathyroid Glands and Recurrent and External Laryngeal Nerves. In: Clark OH, Duh QY, eds. Textbook of Endocrine Surgery. 1st ed. Philadelphia: Saunders, 1997:8-14.
13. Filho VJ, Moyses RA, Moyses NA, Ferraz AR. Pyramidal lobe of the thyroid: intraoperative anatomic study. Rev Bras Cir 2004;33:35-37.
14. Harjeet A, Shani D, Jit I, Aggarwal AK. Shape, measurements and weight of the thyroid gland in northwest Indians. Surg Radiol Anat 2004;26:91-95.
15. Braun EM, Windisch G, Wolf G, Hausleitner L, Anderhuber F. The pyramidal lobe: clinical anatomy and its importance in thyroid surgery. Surg Radiol Anat 2007;29:21-27.
16. Sturniolo G, Bonanno L, Gagliano E, et al. The thyroid pyramidal lobe: frequency, morphological features and related diseases. Chir Ital 2008;60:41-46.
17. Geraci G, Pisello F, Li Volsi F, Modica G, Sciumè C. The importance of pyramidal lobe in thyroid surgery. G Chir 2008;29:479-482.
18. Braun, E.M., Windisch, G., Wolf, G., Hausleitner, L. and Anderhuber, F. (2007) The Pyramidal Lobe: Clinical Anatomy and Its Importance in Thyroid Surgery. Surgical and Radiologic Anatomy, 29, 21-27.
19. http://dx.doi.org/10.1007/s00276-006-0165-1 Moore, K.L. and Persaud, T.V.N. (1993) The Developing Human. Clinically Oriented Embryology. WB Saunders Company, Philadelphia, 200-203.
20. Starck, D. (1965) Embryologie. Ein Lehrbuch auf allgemeinbiologischer Grundlage. Thieme, Stuttgart, 456-458.]