



Branching Pattern of Thyrocervical Trunk-Fetal Study

KEYWORDS

Thyrocervical trunk, Branching pattern, neurovascular structures, Subclavian artery. SCA-Subclavian artery. TCT-Thyrocervical trunk. IT-Inferior thyroid artery. SC-Superficial cervical. DS-Dorsal scapular. SS-Supra scapular artery. AC-Ascending cervical artery

Dr.V.Lokanayaki

M.B.B.S, D.O, M.S, Associate Professor, Institute of Anatomy, Madras Medical College, Chennai-3
New no:28, B2 Elegant House, Neelakandan Street, Choolaimedu, Chennai- 94

Dr.Sudha seshaiyyan

M.S, Director & Professor, Institute of Anatomy
Madras medical college, Chennai-3

ABSTRACT *Branching Pattern Of Thyrocervical Trunk – Fetal study*

Lokanayaki.V. Sudha Seshaiyyan

Madras Medical college

Chennai-3

Aims&Objectives; Since the subclavian artery and its branches are involved in so many clinical instances, the study of Thyrocervical Trunk a branch of Subclavian artery, its origin, its branches its variation in Fetuses is selected for analysis

Materials&Methods; In Ten fetusus of unknown sex between 32—36 weeks gestation subclavian artery was exposed using conventional dissection method.and the origin &branching pattern of Thyrocervical trunk on both sides was studied. **Results&Conclusion;**The number of branches varied from two to four,in both sides in fetus. Of this in one specimen on right side two inferior thyroid artery arising from a common stem was noticed.As so many neurovascular structures are closely related to thyrocervical trunk•branches this study will be useful clinically **Branching Pattern Of Thyrocervical Trunk – Fetal study**

Lokanayaki.V. Sudha Seshaiyyan

Madras Medical college

Chennai-3

Aims&Objectives; Since the subclavian artery and its branches are involved in so many clinical instances, the study of Thyrocervical Trunk a branch of Subclavian artery, its origin, its branches its variation in Fetuses is selected for analysis **Materials&Methods;** In Ten fetusus of unknown sex between 32—36 weeks gestation subclavian artery was exposed using conventional dissection method.and the origin &branching pattern of Thyrocervical trunk on both sides was studied. **Results&Conclusion;**The number of branches varied from two to four,in both sides in fetus. Of this in one specimen on right side two inferior thyroid artery arising from a common stem was noticed.As so many neurovascular structures are closely related to thyrocervical trunk•branches this study will be useful clinically

INTRODUCTION

THYROCERVICAL TRUNK (THYROID AXIS)

According to Henry W.Gray¹ thyrocervical trunk arises from the front of the subclavian Artery's first part near the medial border of scalenus anterior divides almost at once into the inferior thyroid, superficial cervical and suprascapular arteries.

About a third of the superficial cervical and dorsal scapular arteries arise in common from the thyrocervical trunk as a transverse cervical artery with a superficial (Superficial cervical artery) and a deep branch (dorsal scapular artery).

MATERIALS AND METHODS

In Ten embalmed dead fetusus of unknown sex between 32—36 weeks

Subclavian artery was exposed on both sides using conventional dissection method and the branching pattern of Thyrocervical trunk was studied

RESULTS

Origin of Thyrocervical Trunk

Right side

From first part of Subclavian in 7/10 ,

From second part in 3/10 cases,in that cases subclavian artery passed in front of Scalenus Anterior muscle

Left- From first part of SCA in all the ten specimens

Branching pattern of Thyrocervical Trunk

Right side:

Three branches-IT,TC,SS -8/10 (80%)(fig-1)

Two branches-1.IT& a common stem dividing into Transverse cervical and Suprascapular(fig-2)

2.Two Inferior Thyroid artery arising from a common stem and a Common stem dividing into Transverse cervical &

Suprascapular artery(fig-3) So totally in 2/10(20%), cases.



3 Branches-IT,TC,SS (fig-1)



2 Branches- From RT TCT,Inferior thyroid,common stem dividing into Transverse cervical&Suprascapular(fig-2)

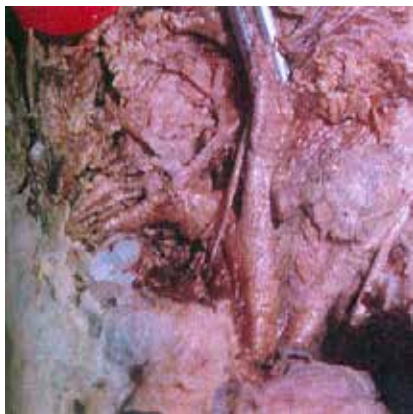


Fig-3
Two Inferior Thyroid artery arising from a common stem and aCommon stem dividing into Transverse cervical & Suprascapular artery(fig-3)

Left side

4 Branches:
IT,AC,TC,SS 1/10 (10%)(fig-4)



fig-4 4 Branches from Left TCT-IT,AC,TC,SS

3 Branches:8/10(80%)
IT,TC,SS in 5 specimens(Fig-5)



fig-5 3 Branches- Common stem into IT,TC,SS
IT,SC,common stem dividing into Dorsal scapular & Suprascapular in 3 specimen(fig-6)



3 Branches from Left TCT- IT,SC,Common stem dividing into DS&SS(fig-6)

2 Branches;



IT,SS 1/10(10%)LEFT TCT-2 BRANCHES-IT,SS(Fig-7)

BRANCHING PATTERN OF THYROCERVICAL TRUNK IN FETUSES

Side	N	No. of Branches									
		4		3		3		2		1	
		IT, AC, TC, SS		IT, TC, SS		IT, SC, SS/DS		IT,COMMON STEM INTO TC,SS		IT	
		N	%	N	%	N	%	N	%	N	%
Right	10	0	0	8	80	0	0	2	20	0	0
Left	10	1	10	5	50	3	30	1	10	0	0
Total	20	1	5	13	65	3	15	3	15	0	0

DISCUSSION

According to Henry W.Gray's¹ Textbook of Anatomy the Thyrocervical Trunk which arise from first part of subclavian

Artery usually divides into inferior thyroid, superficial cervical and suprascapular arteries. In one third of cases the superficial cervical and dorsal scapular artery arise in common from TCT as Transverse cervical artery. Branching pattern of thyrocervical trunk was compared with

J.J. Long (1891)² study, Daseler & Anson (1959) Study, Mathur, Shamer Singh and Singh (1974), study **J.J. Long & A. Thomson 1891**³ studied the formation of Thyroid axis. Thomson 1891 found the typical pattern of branching of thyrocervical trunk was found to occur in 29 percent of 544 bodies in a British Series. The inferior thyroid artery is the most constant branch in its origin from thyrocervical trunk yet it has been missing in 6 percent of cases. Either the supra scapular or transverse cervical artery or both may arise directly from subclavian artery. Also these arteries may arise by a common stem either from thyrocervical trunk or subclavian artery directly or one branch may arise from thyrocervical and other may arise from subclavian.

J.J. Long 1891³ found 4 primary modes in which branches of thyroid axis were distributed. These variation are tended to be same on both sides of body. Of these inferior thyroid arose from the axis with only one exception. The suprascapular artery was also found to be very constant branch of thyroid axis there being only 4 exceptions, vide groups 4 variation. The Dorsal Scapular artery in 42 cases of 75 arose from the third part of out subclavian artery. In 22 instances as separate trunk 20 being conjoined with superficial cervical artery as transverse cervical artery. Branches from thyrocervical Trunk

Variation 1 : 3 branches: Inferior thyroid, Transverse Cervical, Suprascapular Artery

J.J. Long : 44% (33/75).

In present fetal study 80% (8/10) on right side, 50% (5/10) on left

Variation 2 : 3 branches : Inferior thyroid, Superficial Cervical, Suprascapular Artery

J.J. Long : 29.3% (22/75)

In present study, 3 branches inferior thyroid, superficial cervical, suprascapular and dorsal scapular arose together from Thyrocervical trunk on left side in 30% (3/10), on right side no such pattern was found.

Variation 3 : 2 branches : Inferior thyroid and Suprascapular Artery

J.J. Long : 28% (21/75)

In present Study , on right side, inferior thyroid and a common stem dividing into transverse cervical & suprascapular in 20

%(2/10) cases on right side, inferior thyroid and suprascapular as two branches in 10% (1/10)

Variation 4 : 1 branch: Inferior thyroid only

J.J. Long : 5.3% (4/75)

No such pattern found in present study.

Author	Variation in Percentage			
	1	2	3	4
J.J. Long (1891)	44	29.3	28	5.3
Present Study)				
Fetuses	80		15	0

Bean R.B. 1905⁵ made a composite study of the subclavian artery in man and classified the branches of the subclavian artery on the basis of variation occurring in the derivation of branches of the thyrocervical trunk.

Gould 1909 reported a case having branches from thyroid axis from the first part as Inferior thyroid, transverse cervical and Dorsal scapular from 3rd part

De Garis C.F. 1924¹ described the patterns of branching of subclavian artery in white and negro stocks. Both De Garis and Adachi 1928 found that Dorsal scapular artery arose from transverse cervical artery of the thyrocervical trunk, in approximately one half of their series; in the other 50% of their material the dorsal Scapular artery arose from 3rd part.

Daselar E.H and B.J. Anson 1959 found no thyro cervical trunk in 17% of sides its place usually being taken by inferior thyroid artery. In his 770 specimens branching pattern of thyrocervical as 3 branches namely inferior thyroid, superficial cervical, suprascapular is seen in 46.75% of cases.

In the study done by Mathur, Shamer Singh and Singh (1974), Thyrocervical trunk was found to arise from 1st part in 98.0% of cases and from 2nd part in 1.9% of cases. Branching pattern into inferior thyroid, superficial cervical, suprascapular was seen in 50.3% of cases.

Origin of Thyrocervical Trunk in present study

Right side-From first part of Subclavian in 7/10 ,

From second part in 3/10 cases, in that cases subclavian artery passed in front of Scalenus Anterior muscle

Left- From first part of SCA in all the ten specimens

Tokafuj T.Soto Y 1991 STUDIED the branches of subclavian artery in Japanese adults in 72 Japanese adults i.e in 144, Subclavian arteries. The most **common type of transverse cervical artery which formed from common trunk consisting of superficial and deep branch was observed with the highest incidence 61.8%.**

Yucel AH 1999⁹ observed a variation in a singular cadaver in which thyrocervical trunk was absent on right side. The two branches which normally originate from the thyrocervical trunk had a different origin the transverse cervical artery arose directly from the subclavian artery and suprascapular artery from the internal mammary artery thereby providing a short route for posterior scapular anastomosis.

Read and trotter 1941¹ found that transverse cervical artery arose from thyro cervical trunk 70.8%, from Dorsal scapular in 28.9% of cases.

RESULT & CONCLUSION

Right; From first part of Subclavian in 7/10 , from second part in 3/10 cases, in that cases subclavian artery passed in front of Scalenus Anterior muscle

Left ; From first part of SCA in all specimens.

Branching pattern of TCA

Right side:

Three branches-IT,TC,SS -8/10(80%) of cases

Left side; Three branches-IT,TC,SC-5/10(50%) of cases.

Knowledge about origin, and any accessory branches of INFERIOR THYROID ARTERY will be definitely helpful to surgeons while performing thyroid surgeries. Orthopaedic surgeons while removing the cervical rib care should be taken to avoid damage to subclavian artery and its branches like transverse cervical artery. So that they can prevent undue postoperative haemorrhage. The Plastic surgeons while they are undertaking Head and neck reconstructive surgeries they have to take trapezius (Musculo cutaneous) flap which is supplied by dorsal scapular artery and at that time they must be aware of the origin and variant pattern of the above said Dorsal scapular artery so that rejection of the graft will not take place in the post operative period. Like this way, in each and every branch of medicine especially surgery a thorough Anatomical knowledge about the subclavian artery and its branches will be of immense value.

In this aspect my study regarding the Branches of Thyrocervical Trunk one of the branch of subclavian artery on both sides, will be of definite use to the respective operating surgeons

References

1. Henry W. Gray Text book of Anatomy, Branches of Subclavian Artery, (38th edition), 1530-1536.
2. Long, J.J. (1891) Formation of the thyroid axis. Transactions - Royal Academy of Medicine in Ireland 9 : 483 - 484.
3. Bean R.B. A Composite study of the Subclavian Artery, in man. Am. J. Anat., 1905, 4 : 303 - 328
4. Gould, E.L.P. (1909). A case of abnormal right subclavian artery". Journ. Anat. and Phys. XLIII 324
5. Degaris, C. 1924, Patterns of branching of the subclavian artery in white and Negro stocks. Am. J. Phys. Anthropol. 7 : 95 - 107.
6. Daseler, E.H. and Anson, B.J. (1959) Surgical Anatomy of the subclavian artery and its branches. Surg. Gynaec. and Obst. 108, 149 - 174.
7. M.M.Mathur, Shamer Singh and S.P. Singh, (1974) The Patterns of Branching of the Subclavian Artery J.Anat.Soc.India 23,no.1, 11-18.
8. Takafuji T, Sato Y. Okajimas folia Anat Jpn 1991 Aug;68 : 171-185.
9. Yucel AH, Kizilkanat E, Ozdemir Co. The variations of the subclavian artery and its branches (1999). Okajimas Folia Anat Jpn. 1999, Dec.76(5) : 255 - 261.
10. Read, W.T. and Trotter, Mildread, (1941). Am. J. Phys. Anthropol. 28 : 239, cited by Hollinshead in Anatomy for surgeons. Vol.I, P.471. vide supra.