Journal of Population Therapeutics & Clinical Pharmacology

RESEARCH ARTICLE
DOI: 10.53555/7qq2kh30

VARIATIONS OF TRUNCUS THYROCERVICALIS

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INTRODUCTION:
Subclavian artery arises from arch of aorta ,supplies considerable region of thoracic wall, neck and brain throught its branches. The thyrocervical trunk arises from first part of subclavian artery. The branches of thyro cervical trunk are inferior thyroid artery, suprascapular artery and superficial cervical artery. Normally it arises from anterosuperior side of subclavian artery, proximal to medial border of scalenus anterior muscle. Thyrocervical trunk is called as Truncus thyrocervicalis in Latin. Henry Gray stated that thyrocervical trunk arises from first part and divides into Inferior thyroid artery, Superficial cervical and Suprascapular arteries. About a third of superficial cervical and dorsal scapular arteries arise in common from Thyrocervical trunk.
Inferior thyroid artery: It ascends in front of medial border of scalenus anterior and arches medially at the level of C7 vertebra. On reaching lower pole of thyroid gland, the artery divides into ascending and descending branches. The ascending branch anastomose with superior thyroid artery and supply parathyroid glands. Thyroid gland is highly vascular gland. it receives rich blood supply through superior and inferior thyroid artery. To keep morbidity minimum during thyroid surgery, surgeons should have exact knowledge of topographic anatomy and its variations.
Superficial cervical artery: It passes laterally and upward in front of phrenic nerve, scalenus anterior and appears in posterior triangle, in front of trunks of brachial plexus and levator scapulae. The artery descends beneath trapezius and anastomoses with superficial division of descending branch of occipital artery.
Suprascapular artery: The artery runs behind the clavicle, subclavius, and inferior belly of omohyoid and runs above Suprascapular ligament. On reaching dorsal surface of scapula, it forms scapular plexus by anastomosing with circumflex and dorsal scapular arteries. In about one third, dorsal scapular and superficial cervical take a common origin from Thyrocervical trunk in the name of Transverse cervical artery.

MATERIALS AND METHODS: Thirty embalmed cadavers was exposed on both sides using conventional dissection method to study the branching pattern of thyrocervcical trunk.

OBSERVATIONS: Branches of thyro-cervical trunk is three namely, inferior thyroid artery, transverse cervical artery (TCA), suprascapular artery. Three branching patterns on right side was present in 23/30 subclavian arteries. (**Table 1, Chart 1)**
One of the usual branch - suprascapular artery (SSA) is absent in 9/30 Thyrocervical trunk (TCT) (third branch was ascending cervical artery). In left side 22/30 Thyrocervical trunk are having three

branches, of these 22 Thyrocervical trunk, in four Thyrocervical trunk –suprascapular artery is absent (third branch was ascending cervical artery).
The next type was Thyrocervical trunk having two branches from common stem namely inferior thyroid artery and ascending cervical artery was seen in 6/30 on right side and 4/30 on left side. (Figure 1) Four branches of Thyrocervical trunk was found in 1/30 on right side and 2/30 on left side. Four branches found was Inferior Thyroid Artery, ascending cervical artery, Transverse cervical artery and Suprascapular artery.
Five branches of Thyrocervical trunk was found in 1/30 on left side. Five branches are namely inferior thyroid artery, ascending cervical artery, transverse cervical artery, Suprascapular artery, internal thoracic artery. No such number of branches were present in right side. (figure 2. 1 &2. 2)
In one Subclavian artery on left side Thyrocervical trunk is absent but the branches Inferior thyroid artery, arise as direct branch from Subclavian artery. (Figure 3) and blood supply to cervical and scapular region is given by a trunk cervico scapular trunk. Infundibular dilatation is seen in 1/30 thyrocervical trunk on left side which is having five branches.

Table 1: No of branches of Thyrocervical trunk

No of branches of TCT	Right	Left (out of 30, in one TCT is absent)
Two	6/30(21%)	4/30(13%)
Three	23/30(76%)	22/30(71%)
Four	1/30(3%)	2/30(6%)
Five	-	1/30(3%)

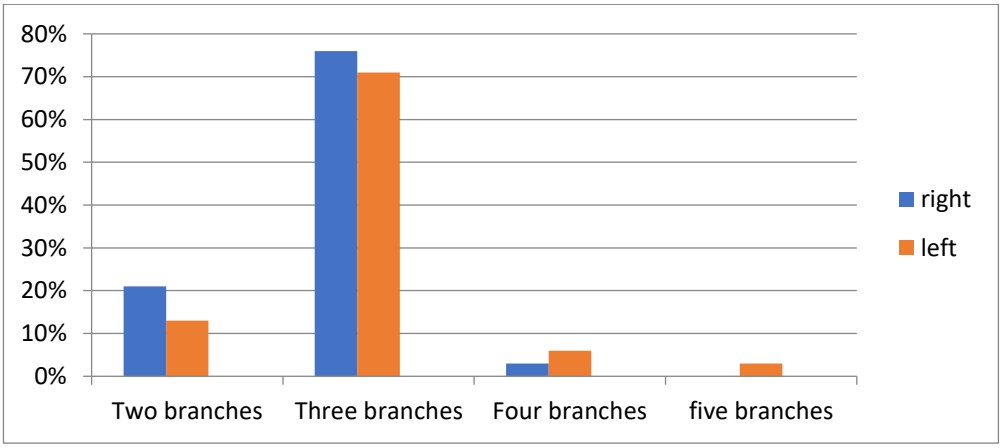


Chart 1: Percentage of branches of Thyrocervical trunk

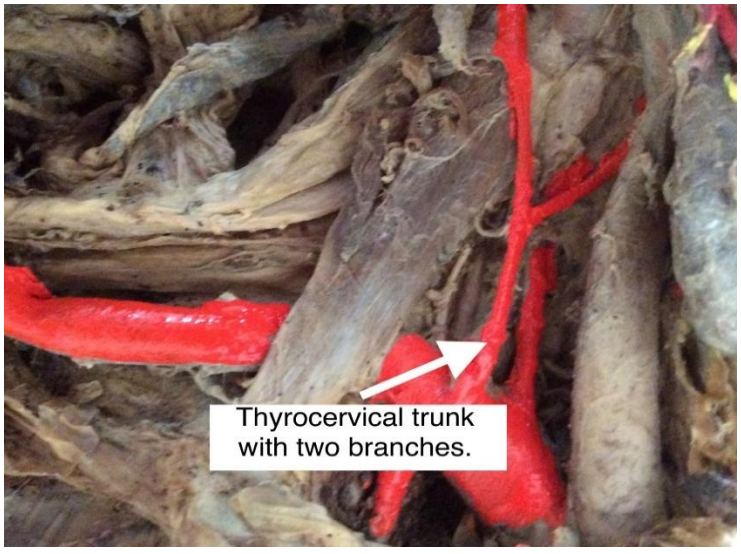


Figure 1: Thyro cervical trunk with two branches

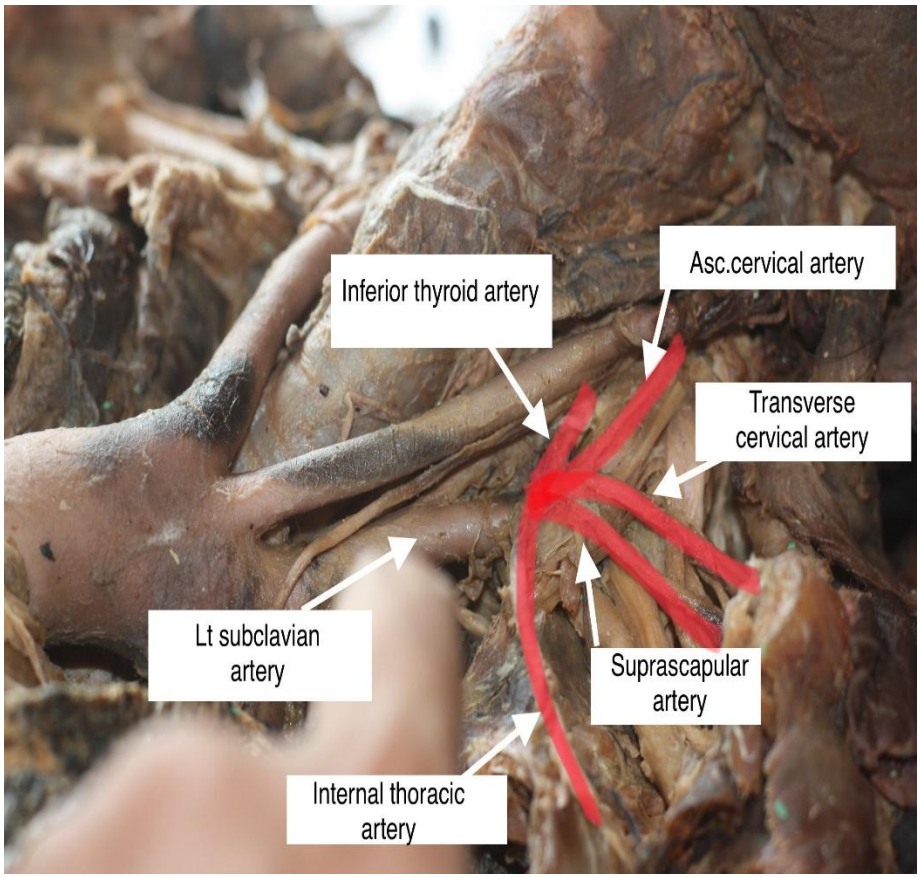
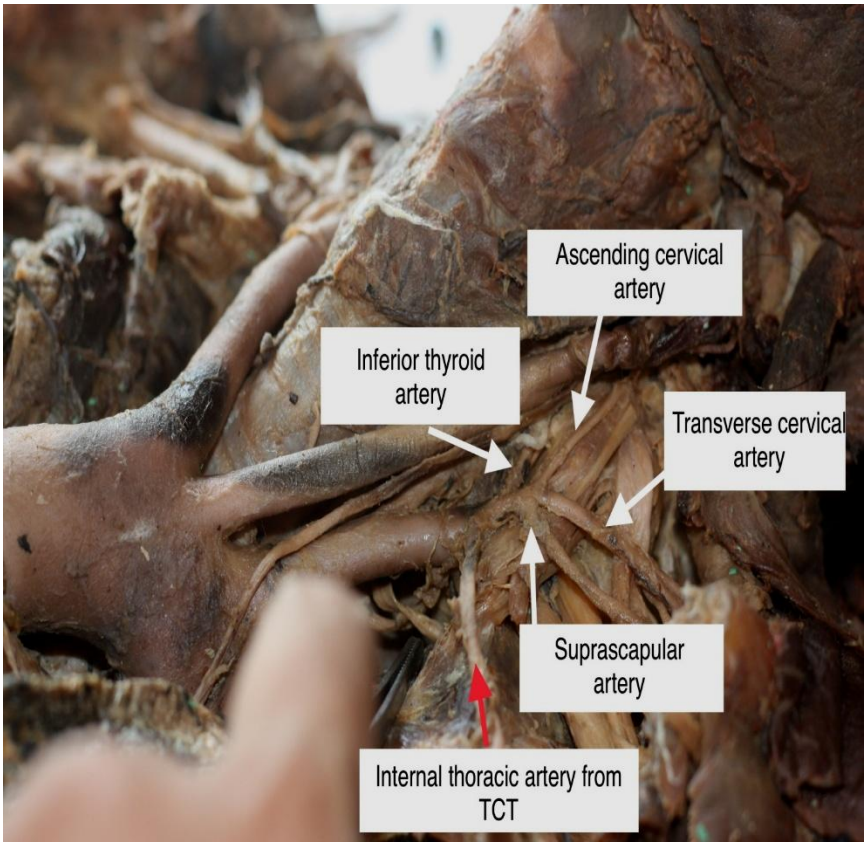


Figure 2. 1: Thyrocervical trunk with five branches



Thyro-cervical trunk:

Fig2. 2: Internal Thoracic artery from thyrocervical trunk TCT

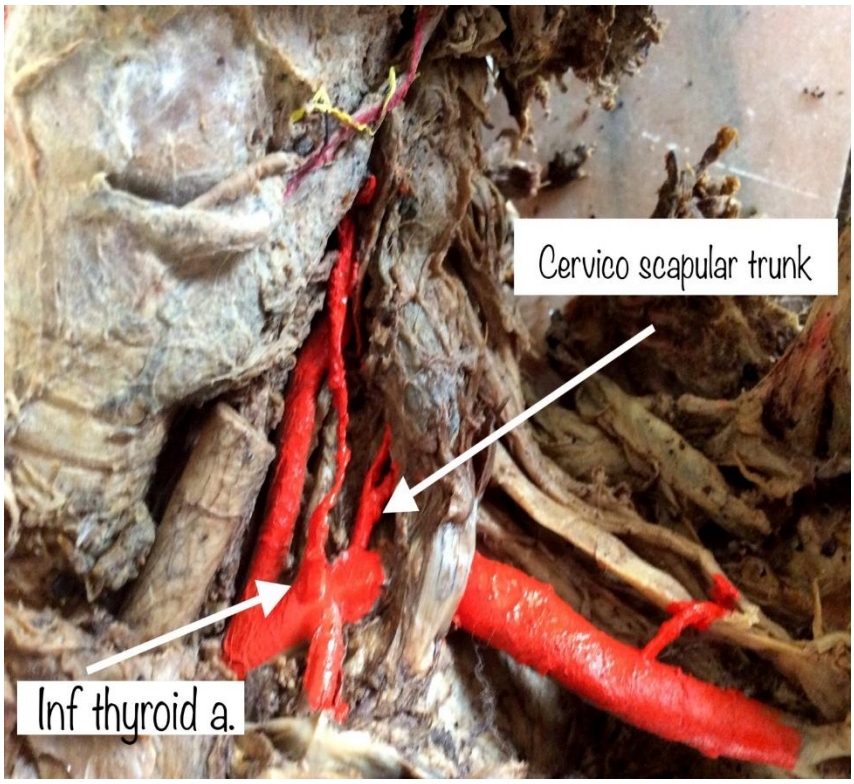


Figure 3: Inferior Thyroid artery from Subclavian artery, Thyrocervical trunk absent.

Inferior thyroid artery:
Inferior thyroid artery in all the 30 subclavian arteries right and left arise from first part of subclavian artery. Inferior thyroid artery arises from Thyrocervical trunk in all 30 arteries on right side. In left side 29 inferior thyroid arteries from Thyrocervical trunk, one directly from Subclavian artery. (**Figure 3, Table 2**)

Table 2: Origin of inferior thyroid artery

Origin of inferior thyroid artery	TCT	Other source
Right	30	-
Left	29(97%)	1 Directly from first part of SCA (3%)

TRANSVERSE CERVICAL ARTERY
Transverse cervical artery one of the branches of Thyrocervical trunk. Transverse cervical artery one of the branches of Thyrocervical trunk in 24 arteries on right side, absent in six arteries. **(Table 3).** In left side Transverse cervical artery is present in Thyrocervical trunk of subclavian arteries in 25 arteries, absent in five Thyrocervical trunk.

TABLE 3 Presence /absence of Transverse cervical artery

TCA	Right	Left
Present	24(80%)	25(83%)
Absent	6(20%)	5(17%)

SUPRASCAPULAR ARTERY
Suprascapular artery is one of the branches of Thyrocervical trunk, from first part of Subclavian arteries in 18 Thyrocervical trunk on the right side. Nine Suprascapular artery also arise from third part of Subclavian artery. (**Figure 4, Table 4)** In one Subclavian artery, Suprascapular artery is absent, but it is seen in first part of axillary artery in right side **.** On the left side 21 Suprascapular artery is

from Thyrocervical trunk. 4 Suprascapular artery arise from third part of Subclavian artery, five Suprascapular artery was seen to be originating from first part of axillary artery.

TABLE4 Origin of Suprascapular artery

Suprascapular artery	Right	Left	Percentage
First part	18(60%)	21(70%)	65
Third part	9(30%)	4(13. 3%)	21. 6

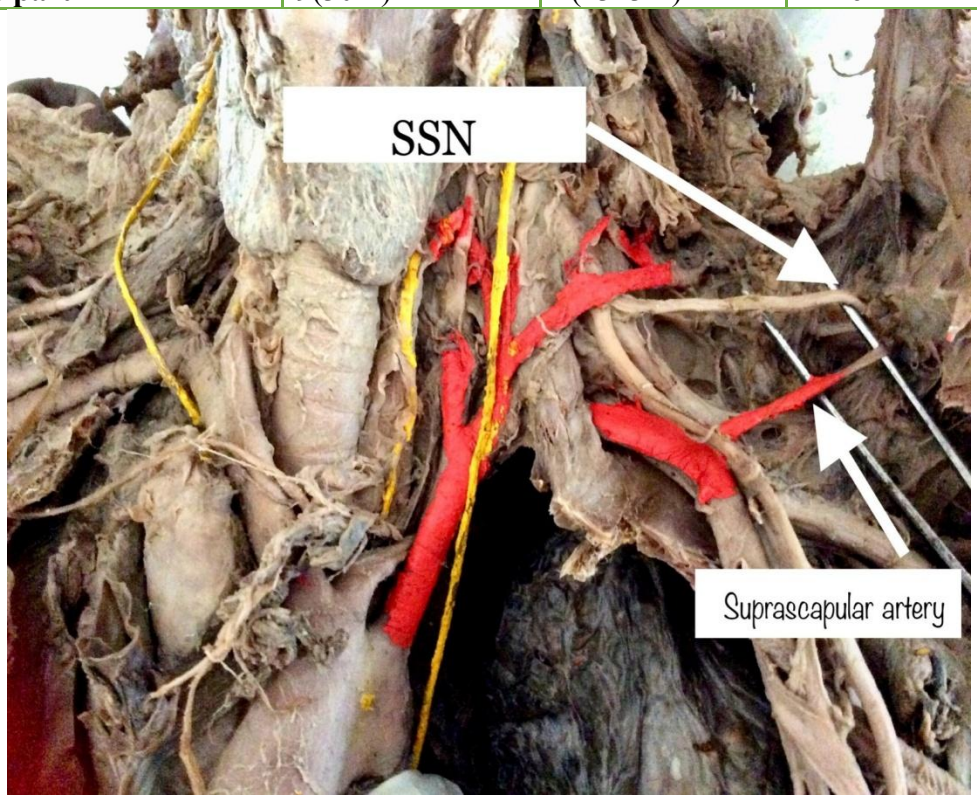


Figure 4: Supra Scapular artery from third part of Subclavian artery (SSN-Supra Scapular Nerve)

DISCUSSION:

Thyrocervical trunk:

In the study done by **Loganayagi et al**[1] the incidence percentage of 3 branches of first pattern is 61. 5%, in the same study two branch pattern is seen in 5%, Thyrocervical trunk absent in 5%. In the study by **Toyaharu**[2] **two** branching pattern is seen in 11. 1%.

Five branch patterns were reported in a case study by **Mariana Branatuszowa**. [3]In the study done by **Lopez** [4]three branch pattern is seen in 40%, four branching patterns were seen in 14. 5%. two branch pattern seen in 50%, absence of TCT in 9%.

The study done by Lopez[4] states that two branching patterns is more whereas Dasler Anson[5] stated that 3 branching patterns is more.

In the current study three branches of Thyrocervical trunk was seen in 56. 6%. The next pattern was Thyrocervical trunk having two branches are seen in 16. 6%. In one of the two branching pattern ,inferior thyroid artery arise directly from subclavian artery and cervico scapular trunk arise separately. Four branches of Thyrocervical trunk was also seen one on the right and two on the left. The percentage of incidence is 5%.

Five branches of Thyrocervical trunk was seen in one TCT on the left. (1. 6%). In one (1. 6%) of the Subclavian artery on the left side Thyrocervical trunk is absent, branches arise directly.

This current study correlates well with the study of **Loganayaki**[1] in three branching patterns. In two branching patterns the present study correlates well with the study by **Toyaaharu**[2] **(Chart 2)**

Of all the branches inferior thyroid artery from thyrocervical trunk is the least to show the variability in its origin.

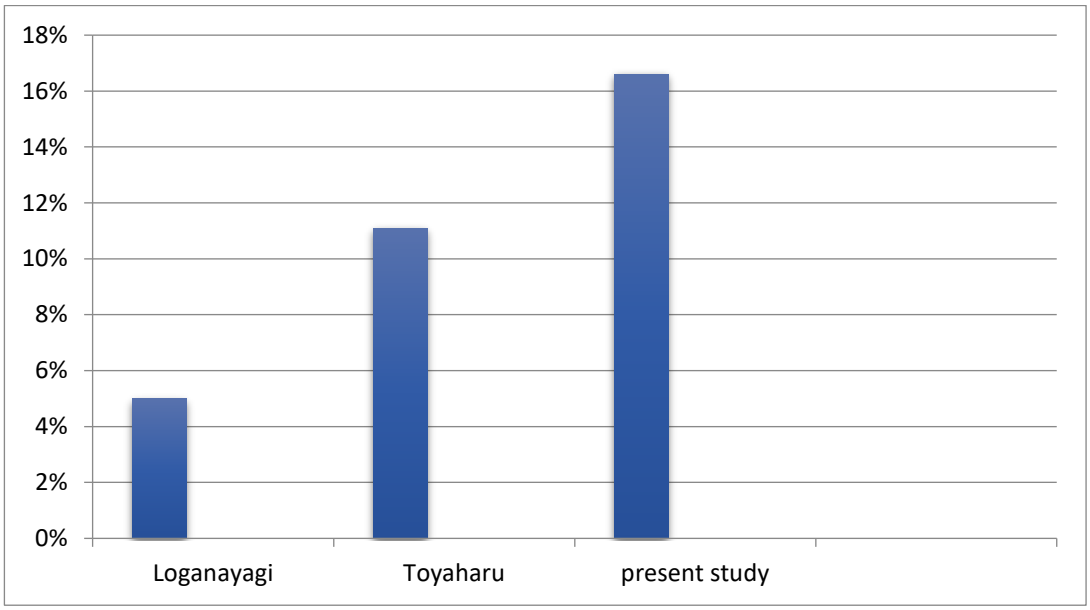


Chart 2: Comparative study of Thyrocervical trunk having two branches.

Inferior Thyroid Artery: Inferior thyroid artery is one of the branches of Thyrocervical trunk. In the study by **Elissa**[6] found that thyrocervical trunk is absent but the branches, inferior thyroid artery arise directly from subclavian artery of this type.
In the study done by **Loganaygi**[1]Inferior thyroid artery as a direct branch of subclavian artery in 5%. Similar to the above study, in the current study Inferior thyroid artery arise as a direct branch in 1. 6%.
Inferior thyroid artery is one of the important source of blood supply to thyroid gland. Knowledge about origin and any accessory branches of INFERIOR THYROID ARTERY will be definitely helpful to surgeons while performing thyroid surgeries.

TRANSVERSE CERVICAL ARTERY
In the study done by **DONALD HEULKE** [7]it is found that Transverse cervical artery from Thyrocervical trunk is seen in 77. 5%, and in the study by **THOMSON**[8] Transverse cervical artery from Thyrocervical trunk is seen in 86. 9%.
The study done by **Loganayaki et al**[1] found to Transverse cervical artery from Thyrocervical trunk in in 59%.
In the **present study** Transverse cervical artery from Thyrocervical trunk is seen in 81%.

SUPRASCAPULAR ARTERY
In the study done by **N Naidoo**[9] et al on variations of subclavian axillary Arterial tree found that suprascapular artery from Thyrocervical trunk is found from first part of Subclavian artery in 53%, from third part of Subclavian artery in 19%.
In the study done by **Dasler Anson**[10] Daselor, E. H. and Anson, B. J. (1959): Surgical anatomy of the subclavian artery and its branches. Surgery Gynaecology and Obstetrics 108: 149-174.
found that suprascapular artery from first part in 81. 5%, suprascapular artery from third part of Subclavian artery in 13. 15% and branching of suprascapular artery from Axillary artery is rare.
In the current study suprascapular artery from Thyrocervical trunk is 65%, from third part of Subclavian artery is 26%. The current study correlates with study done by **Naidooetal**[9]

Conclusion:

Thyrocervical trunk is present in all subclavian arteries except one on the left. As inferior thyroid artery is one of the important source of blood supply to the thyroid gland and related to recurrent laryngeal nerve . So variations in origin of inferior thyroid artery will be helpful to surgeons. Transverse cervical artery ,it is used in head and neck reconstruction surgery. For the flap reconstruction surgery ,Transverse cervical artery is used as a recipient vessel. During cervical rib operations orthopaedic surgeons should take care to avoid damage to subclavian artery and its branch Transverse Cervical artery. Suprascapular artery irrigates tendinous cuff of shoulder joint. sothe study of variations of suprascapular artery will help in management of disesases from cervical and shoulder region. Internal thoracic artery is the branch from first part of subclavian artery.

It is obvious that Internal thoracic artery from Thyrocervical trunk may complicate surgical grafting procedure. Internal thoracic artery is great conduit for myocardial revascularisation and its variations in origin will be helpful for cardiothoracic surgeons.

In this study Thyrocervical trunk showed variations in its branches, comparison and analysis of results with previous literature showed that Thyrocervical trunk has variations subject to its branches. This information will aid anatomists, vascular surgeons and Head and neck surgeons.

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