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Origin of Brachiocephalic Trunk And Left Common Carotid Artery As A Single Trunk: A Rare Variation

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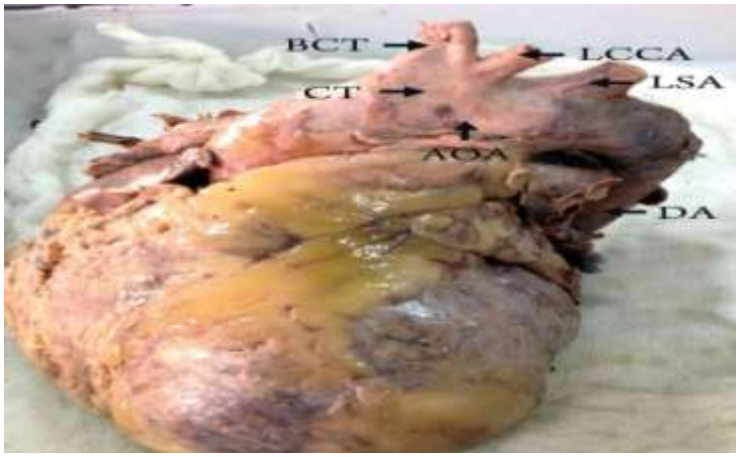
Abstract: *Brachiocephalic trunk, left common carotid artery and left subclavian artery are usually arise from arch of aorta, from right to left direction. Ascending aorta continue as arch of aorta, then it became descending aorta. Arch of aorta and its branches shows many variations. Knowledge of anatomical variation helps to prevent the iatrogenic complication. In the present case study, brachiocephalic trunk and left common carotid artery arise as single common trunk instead of separate branches. Variation is found during the routine dissection. Left subclavian artery is a separate branch. Knowledge of these variation can be great help to surgeons in reducing the chances of intraoperative and postoperative complication.*

Keywords: *Brachiocephalic trunk, Left common carotid artery, Arch of aorta, Common trunk*

I. Introduction

The arch of aorta is continuous from ascending aorta and continuous as descending aorta. The arch of aorta gives brachiocephalic trunk, left common carotid artery and left subclavian artery from convex surface of arch.They are separated from each other by varyingdistance. Variation in origin of above branches have been reported earlier. Knowledge of variation of branches of the arch of aorta is important in various surgical procedures. Identification of anatomical variation including arterial variation related to structures in neck having great importance for planning surgical procedure. Knowledge of such variation of branches of arch of aorta may be important for academic and clinical purposes. The anomalies of branches of arch of aorta are due to variation in fusion process and absorption of aortic arches into aortic sac. The number and origin of branches arising from aortic arch depend on such process.



BCT- Brachiocephalic trunk, LCCA –Left common carotid artery, CT – Common trunk, LSA –Left subclavian artery, AOA –Arch of aorta, DA – Descending aorta

II. Case Report

During the routinedissection of thoracic region of 65yrs. old male cadaver in department of anatomy, IGGMC, Nagpur unusual origin and branching pattern of arch of aorta was observed. Origin of brachiocephalic trunk and left common carotid artery as a single trunk from proximal part of arch of aorta on right side of midline. After division of common trunk, it gives the brachiocephalic trunk and left common carotid artery, where they follow normal course. The diameter of common trunk is about 2.1 cm and length is 1.7 cm. The left subclavian artery is a separate branch arising from arch of aorta and follows the normal course in the body. The position of Ascending aorta, Arch of aorta and Descending aorta was normal in body.

III. Discussion

High localisation of brachiocephalic trunk and left common carotid artery across the trachea increase the risk of injury to these vessels in invasive thoracic procedures. Most probable cause of abnormality is disproportionate elongation and increased diameter during embryonic life.

The common trunk of brachiocephalic trunk and left common carotid artery and left subclavian artery are branches of arch of aorta. Several variations of origin of above arteries have been reported earlier. These variations are important in various surgical procedures of thoracic region.

In the present case, we report that Brachiocephalic trunk and left common carotid artery arise from aortic arch as a single trunk. The Ascending aorta arise from base of the left ventricle behind the left sternal margin opposite 3rd left costal cartilage. Position of Arch of aorta is behind the lower part of sternal manubrium. It starts behind the right border of sternum at the level of 2nd right costal cartilage and extend dorsally to the left to reach the spine of 4th thoracic vertebra.

The distance between origins of branches of arch of aorta varies because of anatomical variation. The inner diameter of single trunk is about 2.1 cm. The level of bifurcation of common trunk is about 1.7 cm from its origin.

Anson (1963) stated presence of left common carotid artery arising from initial portion of brachiocephalic trunk in 0.2% cases because of transformation of embryonic aortic arch system into adult arterial pattern.

The common trunk of brachiocephalic trunk and left common carotid artery was observed by M.L. Nelson & Spark et al (2001). They studied 143 specimen in which they observed single trunk in 0.5% of arch of aorta.

Satyapal et al. (2003) concluded that brachiocephalic trunk and left common carotid artery arising as single trunk in 3.4% in his study.

Maskowitz& Topaz (2003) studied about congenital cardiovascular defect and found single trunk of brachiocephalic trunk and left common carotid artery in 3.2% of 1480 specimen.

S.R. Nayak et al (2006), while studying on embryological basis of organisation of aortic arch found common trunk of brachiocephalic trunk and left common carotid artery in 4.8% of cases.

Natsis K I et al, in his study on aortic arch angiography on 633 patients, observed common trunk in 15% cases. The length of the common trunk varies in each patient.

Sanjeev Kumar also observed similar variations in 3.3% specimen and categorised it as type 3 pattern.

Single common trunk of brachiocephalic trunk and left common carotid artery originating from arch of aorta and was found to be branching into its respective branches. This was found rare in literature and present case is now reporting it.

IV. Conclusion

The present case provide information of rare occurrence of formation of single trunk of brachiocephalic trunk and left common carotid artery. This variation is significant for interventional radiological procedures.

Branching pattern of arch of aorta is highly variable. The knowledge of origin and branching pattern of branches of aorta is essential in enhancing precision and decreasing morbidity related to surgical and interventional procedure. Lack of experience with possible variations could lead to fatal, so iatrogenic injury can be avoided with knowledge of anatomical variations.

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