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Unilateral Higher Level Bifurcation of Common Carotid Arteries- Anatomical Variation

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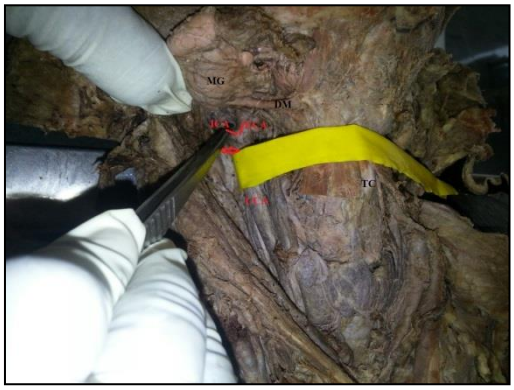
Abstract: During routine dissection for the medical undergraduates in the department of anatomy at ESIC Medical College & PGIMSR, Chennai, INDIA, we have observed higher level bifurcation of right common carotid artery in one male cadaver whereas the left common carotid artery bifurcating at normal level. The unilateral and higher level of bifurcation of the common carotid arteries are very rare cases and such rare case knowledge will be useful to the clinicians and surgeons while planning neck surgeries.
Keywords: bifurcation, carotid artery, higher

INTRODUCTION

On the right and left sides with respect to their origins common carotid arteries are different. Right common carotid artery arises from the brachiocephalic artery and it passes behind the sternoclavicular joint, whereas left common carotid artery originating directly from the arch of the aorta in the superior mediastinum [1].The common carotid artery ascends, diverging laterally from behind the sternoclavicular joint to the level of the upper border of the thyroid cartilage of the larynx (C3-4 junction), where it divides into external and internal carotid arteries [2, 3]. The bifurcation of Common carotid artery is most commonly located at the upper level of thyroid cartilage, but bifurcation may occur as high as C1 or as low as T4 [4, 5]. In the present case report we have observed unilateral high level bifurcation of the right common carotid artery which gives better knowledge in understanding the levels of bifurcation and their clinical importance.

CASE REPORT

During routine dissections for the medical undergraduates in anatomy department at ESIC Medical College & PGIMSR, Chennai, INDIA, we have observed high level bifurcation and its branches of right common carotid artery whereas the bifurcation and its branches on the left side are normal in male adult cadaver. We have dissected the entire course of both the common carotid arteries in the neck up to the level greater horn of the hyoid bone. Usually the bifurcation of the common carotid artery into internal and external carotid arteries at the level of the thyroid cartilage, but in our case the bifurcation is higher level and unilateral, whereas left common carotid artery bifurcating into internal and external carotid arteries at normal level [Figure-1].



Fig–1: Higher level bifurcation of right common carotid artery above the level of thyroid cartilage and its branches *(CCA: common carotid artery; ICA; internal carotid artery; ECA: External carotid artery; TC: thyroid cartilage)*

DISCUSSION

Right and left common carotid arteries ascend in the neck and bifurcate at the level of upper border of thyroid cartilage [1].Rarely there may be variations in the branching level and an anomalous branch [6]. Ito et al. researched the height of bifurcation of the common carotid artery on cadaver dissection [7]. In case of high bifurcation, the embolic material could extend into the common carotid artery instead of the external carotid artery with subsequent stroke [8]. A high common carotid is at a higher risk of impingement by intra articular screws during procedures on cervical vertebrae [9]. Smith and Larsen reported that the left carotid bifurcation to be higher than the right in 50% of the cases and the right bifurcation higher than left in 22% of the cases [10]. The presence of high CCA bifurcation should caution surgeons that the hypoglossal nerve is more vulnerable and that the superior thyroid artery may arise from the CCA [11]. The higher level bifurcation of right common carotid artery incidence is rare and less common in right side and also relatively closer to the hypoglossal nerve and other structures; hence our case is in agreement with previous literature and also gives better knowledge to the surgeons before planning surgeries in the neck region [9−11].

CONCLUSION

The anatomical knowledge of right and left common carotid arteries and their levels of bifurcation is essential to reduce the complication rates of operating procedures in neck region

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