



## UNILATERAL HIGHER BIFURCATION OF COMMON CAROTID ARTERY- A CASE REPORT

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Received: March 03, 2013; Accepted: March 11, 2013

**Abstract-** During routine dissection of 50 years male embalmed cadaver unilateral higher bifurcation of common carotid artery (CCA) was noticed on right side. On the other side the bifurcation of CCA was at normal point which was at the superior border of thyroid cartilage. The branching pattern of external carotid artery (ECA) maintained normal anatomy on both the sides. Variable bifurcation of CCA on two sides in same cadaver is clinically significant. Awareness of such higher bifurcation will lessen the complications during procedures like carotid angiography.

**Keywords-** Common carotid artery bifurcation, Carotid bifurcation, Internal carotid artery, External carotid artery, Superior border of thyroid cartilage

**Citation:** Sabnis A.S., Shaikh S.T. and More R.M. (2013) Unilateral Higher Bifurcation of Common Carotid Artery- a Case Report. Medical Case Reports, ISSN: 0976-8726 & E-ISSN: 0976-8734, Volume 4, Issue 1, pp.-42-43.

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### Introduction

CCA is a branch of brachiocephalic trunk on right side and arch of aorta on left side. It bifurcates into ECA and internal carotid artery (ICA). This division occurs at the superior border of thyroid cartilage, at the level of intervertebral disc of C3 and C4 cervical vertebra [1]. ECA gives number of branches to supply structures in the head, face and neck while ICA enters in the intracranial region without giving any branch in the neck region. Though the origin of ECA and ICA is same i.e. from CCA, the destination is different. So the point of bifurcation is of clinical significance to study any one artery separately.

Superior border of thyroid cartilage was the most stable anatomical landmark for predicting the CCA bifurcation [2]. Variations in this point of bifurcation have been documented. Hypoglossal nerve lies closer in relation to the CCA bifurcation especially when it bifurcates at higher level [3]. The point of bifurcation of CCA is very important during catheterization of carotid arteries, surgeries of head neck region to prevent vascular accidents.

### Case Report

During routine dissection of anterior triangle of neck of 50 years male embalmed cadaver unilateral higher bifurcation of common carotid artery (CCA) was noticed on right side. The point of bifurcation was 20 mm away from superior border of thyroid cartilage. Hypoglossal nerve was in close relation to the point of bifurcation. On the other side the bifurcation of CCA was at normal point which was at the superior border of thyroid cartilage. The branching pattern of external carotid artery (ECA) maintained normal anatomy on both the sides.

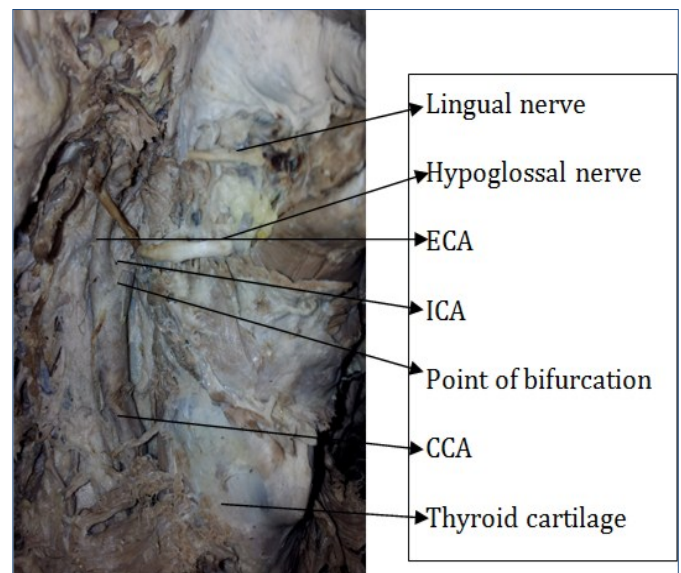


Fig. 1- shows higher bifurcation of CCA on right side

### Discussion

CCA is an important source of blood supply to head, face, neck and brain. Variations in point of bifurcation of CCA and the branching pattern of ECA given by CCA may not hamper the functioning of head, face and neck region but it increases the risk of inviting unwanted problems during procedures like carotid angiography. Surgical and radiological significance of knowing point of bifurcation creates interest and awareness to minimize vascular accidents.

Wide literature about variations in point of variations is available. Variations could be higher or lower in relation to the superior border of thyroid cartilage. The point of bifurcation could be present from hyoid bone above and intrathoracic level below. The frequency of CCA bifurcation at intervertebral disc between C3 and C4 is 22.5%, at C2 is 12.5% [4]. Bilateral higher bifurcation, 3.6 mm above superior border of thyroid cartilage was observed [5]. Carotid bifurcation at the level of hyoid bone in an almost equal proportion of cases as compared to normal level of bifurcation [6]. The bifurcation point of CCA was at the level of hyoid bone in 25% of cases [7, 8], 31.2% [9], 12.5% [10], 13% [11] and between thyroid cartilage and hyoid bone in 18.3% [7].

Change in the level of the bifurcation of CCA may not manifestate functioning but it will definitely misguide the approach to carotid artery during carotid angiography and create serious complications. Carotid endarterectomy is the main treatment for atherosclerotic plaques of the cervical internal carotid artery so with experience of variations one can avoid complications [12]. Radiologist, surgeons and anatomists use thyroid cartilage as external anatomical landmark for judging CCA bifurcation. Awareness of higher bifurcation is very important radiological and surgical point of view as hypoglossal nerve is in the close vicinity of it. To avoid complications related to injury to hypoglossal nerve and ECA or ICA during and after procedures like percutaneous carotid angiography, knowledge and awareness of higher bifurcation is of great importance.

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