Rare Anomaly Of Aberrant Right Subclavian Artery Associated With Right Common Carotid Artery In The Pre Tracheal Position –A Case Report

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ABSTRACT

Congenital variations of the aortic arch and great vessels are often encountered in clinical practice. This is a case report of a 60 year old lady diagnosed with carcinoma thyroid and during the procedure, incidentally diagnosed to have right common carotid artery crossing the trachea anteriorly. Post operative computed tomographic angiographic study confirmed the common carotid artery in the pretracheal position and aberrant right subclavian artery (ARSA) was discovered. This is a rare anomaly of the common carotid artery and to be kept in mind during the procedures done in the pretracheal position and other associated anomalies are to be evaluated.

Keywords: Right Common Carotid Artery Anamoly, Pretracheal Position, Retroesophageal Subclavian Artery, Aberrant Origin

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Introduction:

With the increasing use of imaging studies, variant of the aortic arch has been identified more frequently. Congenital variations of the aortic arch and great vessels are often encountered in radiological practice. They may be symptomatic or asymptomatic and discovered incidentally on imaging.\(^1\) An aberrant origin of right subclavian artery is the most common aortic arch anomaly that occurs in approximately 0.5\%-1.8\% of the population.\(^2\)

An aberrant right subclavian artery (ARSA) is a rare vascular anomaly that is believed to induce feeding and swallowing difficulties in 20\% of the patients, caused by dorsal compression of the esophagus by the anomalous artery.\(^3\) ARSA may occur as a solitary developmental anomaly, or in association with other vascular anomalies such as coarctation of the aorta, diverticulum of Kommerell, or possibly complete interruption of the aortic arch.\(^4,5\) Very few case reports of right common carotid artery crossing the midline in the pretracheal position have been described in the literature.\(^6,7,8\) In this report we describe an unusual case in which the right common carotid artery crosses the trachea anteriorly in the lower anterior neck from left to right side and it is associated with aberrant right retro esophageal subclavian artery.

CASE REPORT:

A 60 year old lady was evaluated for thyroid swelling and diagnosed to have multicentric papillary carcinoma of thyroid in both the lobes largest of size 1.5 cm in the right lobe. After ultrasonic evaluation and confirmation of the malignancy diagnosis, she was planned for total thyroidectomy along with segmental resection of the internal jugular vein. The lower neck transverse skin crease incision was made and subplatysmal flaps were elevated. At the time of mobilization of the lower pole of the thyroid, there was pulsation felt in the pretracheal location in front of the 5\(^{th}\) and 6\(^{th}\) tracheal rings. The pre tracheal region was explored. There was a large caliber artery originating from the mediastinum, crossing the trachea in an oblique course, and reaching the right side and continued upwards as the common carotid artery. (Fig.1) There was no other common carotid vessel in the neck on detailed exploration. The trachea did not reveal any signs of a constriction. There were no significant branches to the thyroid or any structures in the neck and the common carotid artery divided itself into external and internal carotid artery in its usual site of division.

The thyroidectomy was performed with all necessary precautions and other possible variations which might have been present along with the observed anatomical variation. The recurrence laryngeal nerves were usual in their location. The neck was closed in layers and the post operative period was uneventful. The computed tomography angiographic imaging was performed post operatively and there was a right common carotid was following a tortuous course anterior to the trachea in the neck and there was a right aberrant subclavian artery in the retro-esophageal course. (Fig2,3) There was no anatomical variation in the intra cranial and extra cranial course of the carotid vessels. There was no abnormality with the venous anatomy in the neck up to the cardiac entry point.

DISCUSSION:

The right common carotid artery begins at the bifurcation of the innominate artery behind the sternoclavicular joint and is confined to the neck. The anomalies of the right common carotid artery may relate to its origin from the innominate artery or to its division. In 12\% of cases, the right common carotid artery may arise above the sternoclavicular joint.\(^7\) Most deviations from normal carotid anatomy relate to the level of the bifurcation, sequence of branches of the external carotid, or the degree of congenital atresia or stenosis of the vessel. Aberrant right subclavian artery is the result of an embryologic defect, and when they are aberrant; the artery comes off the aortic arch beyond the left subclavian artery and crosses...
the midline, most often dorsal to the esophagus (80%), but may also pass between the esophagus and the trachea (15%) or even anterior to the trachea (5%).


Fig 2: Ct Angiographic Reconstructive Images Showing The Aberrant Right Subclavian Artery And Anamalous Origin Or Right Subclavian Artery. 2a: Right Anterolateral View. 2b: Inferior View. 2c: Superior View. 2d: Anterior View.
The embryological basis of this phenomenon is complex to be understood. The cause of the ARSA can be due to regression of the right fourth aortic arc and subsequently the right seventh intersegmental artery (a precursor of the right subclavian artery) grows posterior to the esophagus to seek a connection with the descending aorta. Multiple theories are postulated for the same. The embryological basis of the common carotid course is not clear and extreme literature review has not shown any association with the development although one of the case report has postulated that the common carotid artery might have simply arose high on the aortic arch and migrated to the left when the descending aorta fused and rotated posterior to the left.

It is important to highlight the fact that despite being a rather uncommon anomaly, patients with ARSA should be carefully examined for coincident vascular defects and their possible complications, particularly in elderly patients.

CONCLUSION:
This study provides the important information on the anatomical variation which will be useful for the surgeons who operate on the anterior neck where the common carotid artery injury can have devastating consequences particularly in the emergency settings. The physicians need to be aware of the associated anomalies which can be associated with it.

REFERENCES:


