

Case Report

A rare case of anatomical variation of aberrant right common carotid and subclavian arteries: its clinical and surgical significance

Brajendra Baser, Praveen Surana, Shirin Ansari*, Pragya Sahu

Department of Otolaryngology, Sri Aurobindo Medical College and Post Graduate Institute, Indore, Madhya Pradesh, India

Received: 20 January 2026

Revised: 18 May 2026

Accepted: 01 July 2026

***Correspondence:**

Dr. Shirin Ansari,

E-mail: Shirinansari25@gmail.com

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Aberrant Right subclavian artery is not a very uncommon anatomical anomaly but its association with Aberrant Right common carotid artery is an extremely rare anomaly. We present a rare case of a 29-year-old female with aberrant right subclavian Artery with Aberrant Right common carotid artery running across the trachea undergoing Total Thyroidectomy. A 29-year-old female patient came with right-sided neck swelling and dysphagia for 15 years. Pre-operative work up revealed a malignant lesion of the thyroid with anomalous vascular supply which was removed via total thyroidectomy under general anesthesia with major vascular supply preservation. Successful and complete excision of the malignant thyroid swelling with neck dissection along with vascular & nervous supply preservation. Anatomical anomalies must be borne in mind prior to any procedures, especially to the neck. The presence of these anomalies may pose challenging situations during thyroidectomies and neck dissections. Thus, avoiding a catastrophic outcome in a straightforward procedure.

Keywords: Aberrant common carotid artery, Aberrant subclavian artery, Non-recurrent laryngeal nerve, Total thyroidectomy, Papillary carcinoma

INTRODUCTION

Aberrant right subclavian artery is not a very uncommon anatomical anomaly but its association with Aberrant right common carotid artery is an extremely rare anomaly. The Aortic arch (AA) is the main conduit of the left side of the heart, providing a blood supply to the head, neck, and upper limbs. As it travels through the thorax, the pattern in which it gives off the branches to supply these structures can vary. Although patients who have an AA variant are often asymptomatic, they compose a significant portion of the population of patients and pose a greater risk of hemorrhage and ischemia during surgery in the thorax.

Because of the possibility of encountering such variants, it is prudent for surgeons to consider potential variations in planning procedures, especially of an endovascular nature.² We report the first of its kind case of an Aberrant right subclavian artery with aberrant right common carotid artery running across the trachea in a patient undergoing total thyroidectomy. This study aims to demonstrate the importance of pre-operative work up to identify any vascular anomaly before surgery.

CASE REPORT

A 29-year-old female patient came with right-sided neck swelling and dysphagia for 15 years which was gradually

progressing in size for past one year. Dysphagia was also gradually progressive and more for solids than liquids.



Figure 1: Clinical images of neck.

On examination, a right-sided neck swelling of size approximately 3.0×2.5 cm, hard and fixed, moves with deglutition, multiple cervical lymph nodes palpable in right side, and largest one measuring approximately 3x2 cm at level III.

On direct laryngoscopy

Bilateral vocal cords were free and mobile (Figure1). The patient's thyroid profile was normal.

USG neck

Right lobe solid vascular and calcified mass of size 2.4×1.76×2.2 cm, volume 78 cc noted with extension up to the isthmus. Left lobe shows 5.7×4.4 cm nodule near upper pole with few calcified foci.

Multiple lymph nodes seen in lower neck above suprasternal notch in front of trachea. A large mass 2.7×2.2×1.9 cm in right side of neck just lateral to right thyroid lobe abutting the sternocleidomastoid muscle, metastatic LN.

FNAC

Suggestive of positive for malignancy (papillary carcinoma of thyroid). Bethesda category VI.

CECT neck

Figure 2 shows the contrast-enhanced computed tomography (CECT) scan of the neck.

Heterogeneously enhancing ill-defined soft tissue density mass lesion of size approx. 23×17×30 mm seen in right thyroid lobe involving isthmus without exophytic component and no significant mass effect. Lesion showing area of necrosis and calcification. Rest of the fat planes are grossly spared - papillary mitotic pathology.

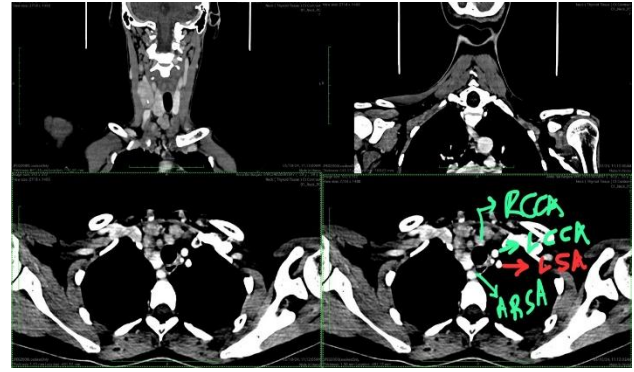


Figure 2: CECT neck images (RCCA- right common carotid artery, LCCA-left common carotid artery, LSA-left subclavian artery, ARSA-aberrant right subclavian artery).

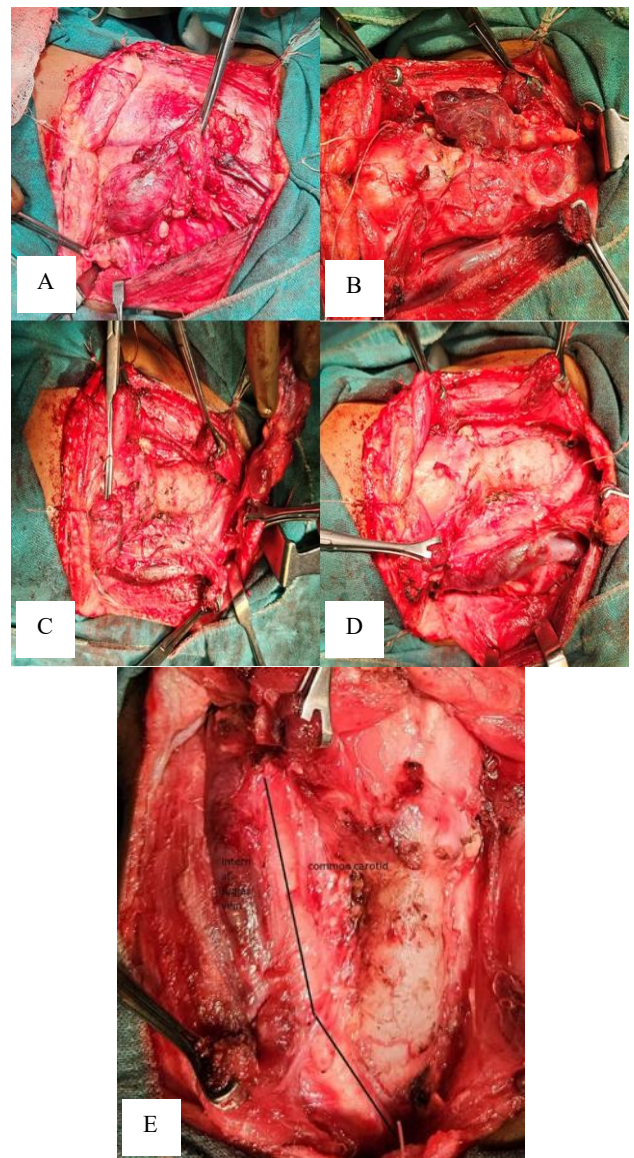


Figure 3 (A-E): Intra-operative images showing right common carotid artery crossing over the trachea and going towards left.

Multiple right supraclavicular, superior mediastinum, submandibular and cervical lymph nodes are seen, largest measuring approx. 30x20 mm, few of them showing punctate calcification-metastatic lymphadenopathy. Brachiocephalic trunk is absent.

Right common carotid is aberrant and arising directly from arch of aorta very close to the left common carotid. Right subclavian artery was also aberrant and passing through retro-oesophageal space between trachea and oesophagus.

Diagnosis

Papillary carcinoma of thyroid with metastatic lymphadenopathy Stage-1 (cT2N1M0) as per AJCC 8th edition.

Surgery

Patient underwent total thyroidectomy with Central compartment and right lateral compartment neck dissection under general anaesthesia.

Intra-operative findings

The intra-operative findings noted during the procedure are presented in Figure 3.

Right common carotid artery found to be coming from mediastinum along left side of trachea and then crossing it at the level of 7-8th tracheal rings and assuming normal course upward on right side. Right non-recurrent laryngeal nerve noted.

Histopathological examination

Figure 4 shows histopathological examination showing papillary formations within thyroid follicles, nuclear overcrowding and overlapping of tumour cells, nuclear grooving, characteristic orphan Annie eye nuclei, and metastatic tumour deposits in a lymph node, consistent with papillary thyroid carcinoma.

Histopathological examination of the specimen revealed papillary thyroid carcinoma involving both thyroid lobes and the isthmus.

Metastatic tumour deposits were identified in 9 of 10 lymph nodes from the central compartment and 4 of 17 lymph nodes from the right lateral compartment.

Based on the American Joint Committee on cancer (AJCC) 8th edition staging system, the pathological stage was classified as pT1bN1bMx.

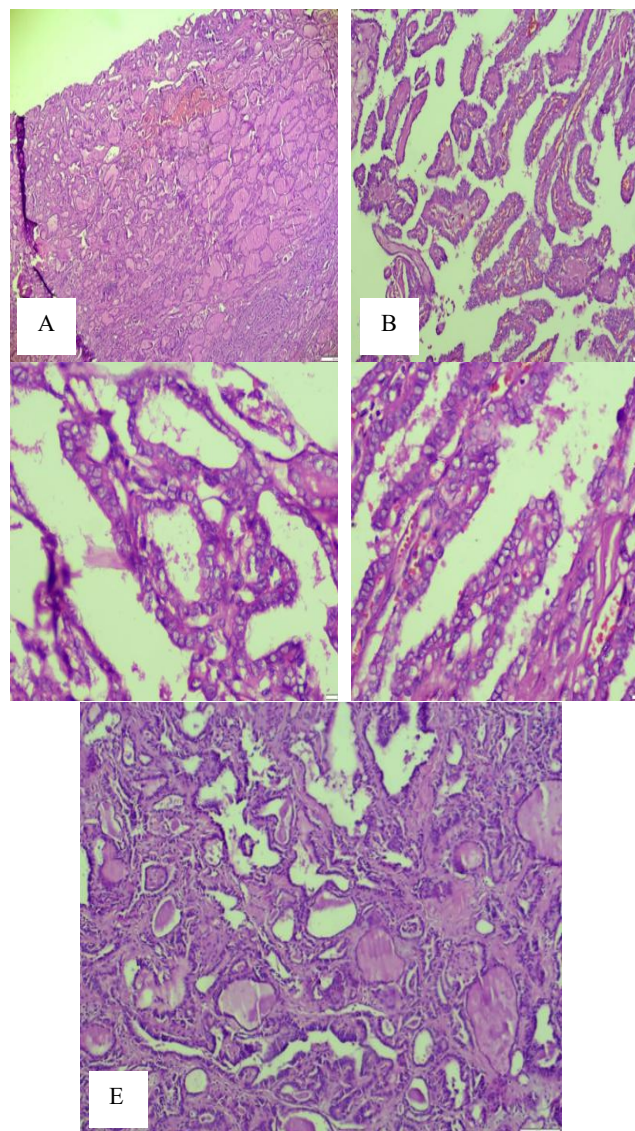


Figure 4 (A-E): Papilla formation; thyroid follicle with papillary formation; nuclear overcrowding and overlapping tumour cells; nuclear grooving with crowding orphan Annie eye cells; tumour metastatic lymph node.

DISCUSSION

The embryology of the great vessels should be appreciated to understand these anomalies. The development of the aorta takes place during the 3rd week of gestation. The embryo develops 6 pairs of aortic arches along with a primitive ventral and dorsal segment. These segments are continuous with the 1st aortic arch. In a systematic review and meta-analysis by Popieluszko et al seven types of aortic arch variations were identified.¹ Conoyer et al described in a case report of a right common carotid crossing the midline of trachea which was found during cadaveric dissection.² On further dissection, abnormality of the aortic arch branches was found. The right common carotid arises directly from the arch, followed by the left common carotid and left

subclavian artery. Another case by Shankar et al found a brachiocephalic trunk arising from the arch of aorta along the left margin of trachea.³ Also, the brachiocephalic trunk gave rise to the subclavian and common carotid over the 4th and 6th tracheal rings. The right common carotid artery then crossed the trachea over the 4th tracheal ring. Prior et al reported an aberrant common carotid artery encountered during free jejunal graft repair of oesophagus stricture in the neck.⁴ On the right side, common carotid artery was found to cross the midline to the other side of the neck and created difficulties for both with the procedure and future management.

CONCLUSION

Anatomical anomalies must be borne in mind prior to any procedures especially to the neck. The presence of these anomalies may pose challenging situations during thyroidectomies and neck dissections. Thus, avoiding a catastrophic outcome in a straightforward procedure.

ACKNOWLEDGEMENTS

The authors extend immense gratitude towards the institute.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: Not required

REFERENCES

1. Popieluszko P, Henry BM, Sanna B, Hsieh WC, Saganiak K, Pękala PA, et al. A systematic review and meta-analysis of variations in branching patterns of the adult aortic arch. J Vasc Surg. 2018;68(1):298-306.
2. Conoyer BM, Varvares MA, Cooper MH. Right common carotid artery crossing the midline neck anterior to the trachea: a cadaver case report. Head Neck. 2008;30(9):1253-6.
3. Shankar N, Raveendranath V, Ravindranath R, Manjunath KY. Anatomical variations associated with the carotid arterial system in the neck. Eur j anat. 2008;12(3):175-8.
4. Prior MJ, Johnson IJ, Jones K, Sharp JF. Aberrant common carotid artery encountered during free jejunal graft repair of oesophageal stricture. J Laryngol Otol. 1997;111(8):772-4.

Cite this article as: Baser B, Surana P, Ansari S, Sahu P. A rare case of anatomical variation of aberrant right common carotid and subclavian arteries: its clinical and surgical significance. Int J Otorhinolaryngol Head Neck Surg 2026;12:701-4.