

A Pulsatile Cervical Mass Revealing a High Riding Brachiocephalic Artery: A Case Report

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Abstract

Case Report

Anterior neck swellings are a common indication for cervical ultrasound in every radiology department. However, pulsatile masses in this region are relatively rare. This 62-years-old lady presented with anterior neck swelling for more than ten years which became more pulsatile recently due to hypertension. Ultrasound was first performed revealing a vascular cervical mass and a CT angiography made the diagnosis of cervical brachiocephalic artery. Right sided pulsatile cervical mass should make every clinician think of this diagnosis to avoid any interventional procedures that could be fatal for the patient.

Keywords: Pulsatile, cervical mass, brachiocephalic artery, ultrasound, CT scans, angiography.

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INTRODUCTION

The most frequent etiologies of anterior neck swelling are enlarged thyroid gland or hypertrophy of lymph nodes; vascular causes such as high riding brachiocephalic artery are not very common. Although carotid artery anomalies were observed and reported in about 1.2 percent of cases, there is still little information available regarding the prevalence of aberrant innominate arteries [2, 3] even if some authors revealed that it can be encountered in 0.3% of cases². Normally the brachiocephalic artery originates from the aorta and bifurcates to common carotid artery and right subclavian artery in the level of the right sternoclavicular articulation [1].

This aberrant bifurcation can cause multiples symptoms such as dyspnea and dysphagia and can be very annoying because of its pulsatility which was the case for our patient. Every clinician must think of this diagnosis because of the difficult repercussions if wrongly treated as a thyroid or lymph node.

PATIENT AND OBSERVATION

A 64 years old woman, with underlying hypertension on amlodipine 5 mg and no previous history of vascular anomaly or surgery, complained of

anterior neck pulsatile swelling for more than ten years which increased in volume and pulsatility recently. She had no signs and symptoms of hyperthyroidism or any constitutional symptoms. On clinical examination, there was a pulsatile anterior neck soft swelling (Figure 1), we made a thyroid examination with the hands of the examiner in the two lobes revealing no ascension after deglutition which excluded the possibility of a thyroid mass. The presence of a pulsatile anterior neck mass leads to suspicion of vascular anomalies like arteriovenous fistula, aneurysms, pseudoaneurysms, and carotid body tumors.

The patient was then addressed to our radiology department for a cervical ultrasound which revealed an arterial mass (figure 2) using color and pulsed Doppler. The sizes of both thyroid lobes were normal, as determined by ultrasound and Doppler. The right subclavian or brachiocephalic artery, which is situated directly below the right thyroid lobe, is the most likely vascular source of the neck swelling.

We performed then a contrast-enhanced computed tomography (CECT) for additional analysis (figures 3 and 4). The right brachiocephalic artery rose along the anterior portion of the trachea beyond the right sternoclavicular joint, according to the CECT

scan, which revealed the neck swelling. The right common carotid and subclavian arteries branches emerged from it just inferior to the superiorly displaced right thyroid lobe once it reached the level of C7-T1 (Figure 3).



Figure 1: Anterior neck pulsatile mass

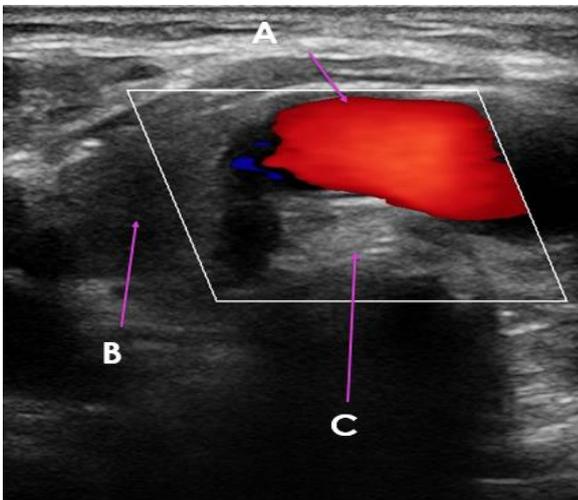


Figure 2: Cervical doppler ultrasound revealing a cervical brachiocephalic artery, (A) Brachiocephalic artery (B) right thyroid lobe (C) trachea and thyroid isthmus

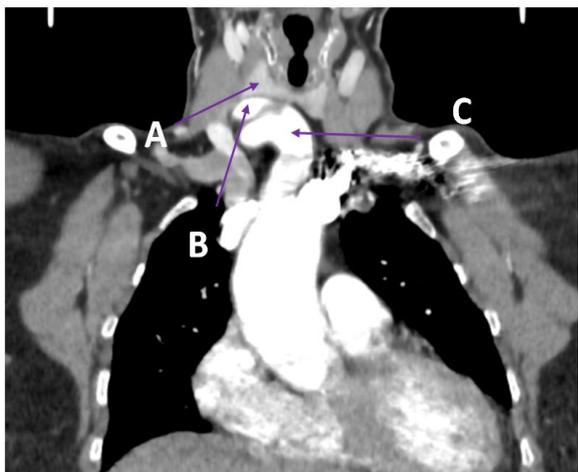


Figure 3: Coronal CT-angiography of aorta and supra-aortic vessels, (A) Thyroid (B) Common carotid artery (C) brachiocephalic artery



Figure 4: Sagittal CT-angiography of aorta and supra-aortic vessels, (A) Cervical brachiocephalic artery



Figure 5: 3D reconstruction of a CT-angiography of aorta and supra-aortic vessels, (A) Cervical brachiocephalic artery

DISCUSSION

The innominate artery, or brachiocephalic trunk, is the first and largest branch originating from the aortic arch, it bifurcates to two branches the right common carotid artery and the right subclavian artery [1]. A high-riding artery can be encountered in 0.3% of cases [2]. It is thought to be due to the persistence of a proximal segment of the right fourth aortic arch [1].

Prior until now, researchers assessed high lying innominate arteries using tracheal rings. These were thought to be high-lying innominate arteries until some researchers discovered the innominate artery at the level of the first, second, third, fourth, and fifth tracheal rings. They were distinguished by the presence of an innominate artery in the cervical trachea's anterior wall, which presented a danger for surgery or led to difficulties afterward [4].

It is challenging to accurately assess the pre-operative surgical risks using tracheal rings. In practical practice, each patient's neck may be different lengths. In clinical practice, we currently use the suprasternal notch, which is significantly simpler to manage⁴. Furthermore, Cai *et al.*, [4] demonstrated that the suprasternal notch offered a trustworthy anatomical

reference in clinical and radiological imaging that was independent of the patient's posture. All participants in this study who were larger than the suprasternal notch (64.8 percent, n 175/270) had a high position BCT created. The prevalence of BCTs above the suprasternal recess was reported to be 26.4 percent (n = 219/829), while the proportion of BCTs with a height more than 2 cm was reported to be 2.2 percent (n = 18/829).

Computed tomography, magnetic resonance imaging, and angiography are among the imaging modalities that can be requested for additional assessment. Even yet, traditional angiography is the most precise method. However it has been replaced by CT angiography and MRI angiography being less invasive. A cautious approach is advocated in cases of verified aberrant or variant of vascular that are asymptomatic, given the potentially disastrous surgical results [5].

Since there is no universally accepted approach to treating this condition, each patient should receive individualized care, and the benefits of surgery must be weighed against the dangers of potential follow-up neurological issues and major bleeding complications [5-7].

CONCLUSION

In the case of a pulsatile anterior neck swelling, we should think about a high riding brachiocephalic trunk as a possible differential diagnosis.

In this clinical presentation, an ultrasound scan is still a primary and crucial diagnostic tool for making the vascular nature diagnosis. Followed then by a CT angiography or MRI angiography if the CT is contraindicated despite being uncommon, this variety is

important since neck surgery could result in a deadly hemorrhage if it is performed.

It is crucial to be aware of variations in a vessel's origin and course that arise from the aortic arch since failing to do so could result in unintended surgical consequences.

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