PHILIPS

Ultrasound

Clinical case study

Assessment of carotid body tumor using the eL18-4 transducer with MicroFlow Imaging

eL18-4 PureWave linear array transducer

Category
Carotid Assessment

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Overview

Carotid body tumors, or carotid paragangliomas, are relatively rare neuroendocrine tumors located within the carotid body – the chemoreceptor located in the adventitia of the bifurcation of the common carotid artery. Although they can be bilateral, they are normally solitary, benign and slow growing. They typically remain asymptomatic until they are large enough to cause compressive symptoms on surrounding vessels or the vagus and hypoglossal nerve. Diagnosis may be incidental although patients occasionally present with a painless lump in level II of the neck.

Patient history

A 76-year-old woman with a complex history of rectal cancer, including previous abdominoperineal resection and short bowel syndrome requiring total parenteral nutrition, attended for a contrast-enhanced CT neck and thorax to assess venous anatomy in order to optimize central line access.

In addition to mapping the upper limb and inferior neck vasculature, CT revealed an incidental hyperenhancing lesion in the right carotid body, suspicious for carotid body tumor, though a differential diagnosis of carotid artery aneurysm was considered (Figure 1).

An ultrasound scan was arranged to further interrogate the findings.

Protocol

A focused scan was performed using a Philips EPIQ ultrasound system equipped with an eL18-4 PureWave linear transducer.

An experienced vascular technologist performed the ultrasound with the patient lying supine. The examination utilized B-mode imaging of the carotid bifurcation with true trapezoid functionality. Color Doppler and MicroFlow Imaging (MFI) were also performed to assess intra-lesional vascularity.

The Philips eL18-4 PureWave linear array transducer is our first high-performance transducer featuring ultra-broadband PureWave crystal technology with multi-row array configuration, allowing for fine-elevation focusing capability.

Figure 1 CT image demonstrating the possible presence of carotid body tumor (yellow arrow).

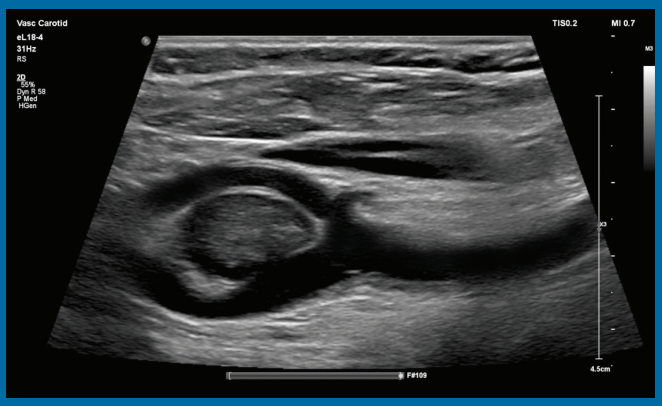

Figure 2 Trapezoid image of carotid body tumor demonstrating its relationship to the surrounding vessels seen with the eL18-4 transducer.

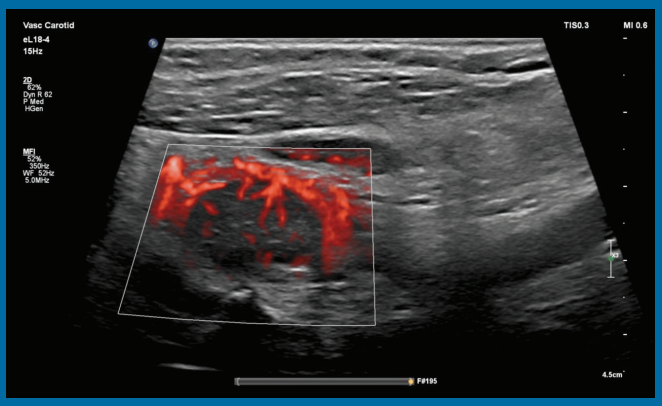

Figure 3 Carotid body tumor with MFI, demonstrating the vascular spaces within the tumor and excluding bland thrombus using eL18-4 transducer.

Findings

Ultrasound imaging revealed a 1.2 cm x 1.0 cm x 1.8 cm well-demarcated lesion at the carotid bifurcation, located between the ICA and ECA, containing both solid and slightly hypoechoic components – a cluster of findings which are most in keeping with carotid body tumor. There was a mild degree of divergence of the internal and external carotid arteries as a result of the tumor location. High resolution imaging obtained with the eL18-4 transducer depicts in fine detail the tumor capsule and its relationship to the arterial walls (Figure 2). This greatly aids tumor characterization and classification by confirming that there is no extracapsular spread, specifically detailing that the lesion neither invades nor encapsulates the arterial walls.

Color Doppler imaging and MFI confirm the presence of vascularity within the lesion (Figure 3). These techniques also exclude the possibility of a thrombosed arterial saccular aneurysm

Conclusion

Ultrasound demonstrates a solid, hypoechoic, well-defined tumor within the carotid sheath, splaying the ICA and ECA and containing vascular spaces. This is a classic presentation for carotid body tumor,[1] and the use of the advanced ultrasound technology described confidently confirms the suspected diagnosis, reliably defining the detailed anatomy required for characterization while excluding the alternative possibility of carotid artery aneurysm.

Reference

1 Ahuja, A, Evans, R, Practical head and neck ultrasound. Cambridge University Press, Cambridge. 2000

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