Ultrasound imaging of a bilateral carotid body paraganglioma
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Paragangliomas are rare tumors that grow from cells of the peripheral nervous system, which derive from the embryonic neural crest. The head and neck represent the most common topography of these tumors. At this level they originate mainly from carotid body (carotid bifurcation), with other possible locations on vagal body, in the middle ear, and larynx. The carotid body paragangliomas (CBPs) are highly vascularized lesions, therefore one formerly name used for them was “glomus tumors”. Another ancient denomination – “chemodectoma” – was indicating their possible chemoreceptor function.

CBPs are usually benign, non-secreting, slow growing tumors. About 60% of them did not exhibit growth in follow-up. Some reports are indicating that 4.2 years is the average double time for this tumors. CBPs can be found at any age, but the usual age for onset is between the third and six decade of life (mean age 55 years) and is slightly more frequent in women. As a whole, carotid body tumors are bilateral in 10% of cases.

The true incidence of CBPs is still unknown as long as many cases remain undiagnosed and the disease is very rare, but it is estimated to 0.012%.

Keywords: carotid body paraganglioma, ultrasound, color Doppler ultrasound

We are presenting the case of a 30 years old male with asymptomatic bilateral swelling of the neck which is the usual presentation in 60-70% of CBP. During the clinical exam we found a palpable mass on each side of the neck, in front of the sternocleidomastoidian muscle, being more easier moved horizontally rather than vertically (the Fontaine’s sign).

In other cases a pulsating mass can be detected at palpation. Very rarely a carotid bruit can be heard, due to an important compression induced by the tumor on the carotid arteries. Large CBP may be associated with dysfunction of the vagal nerve or cranial nerves IX, XI, and XII, with Horner’s syndrome or deficits of the facial nerve.

The usual diagnostic methods for this pathology are: B-mode and Doppler ultrasound, angio-CT, angio-MRI, 111 In-OctreoScan and digital subtraction angiography. Depending on carotid arteries involvement CBPs can be of three categories, according to Shamblin classification: class I – diving of the carotid bifurcation with little attachment to the carotid vessels, class II – partial surrounding of the internal and external carotid arteries, Class III – complete surrounding of the carotid vessels.

A relatively recent evaluation proved a sensitivity of 92% and a specificity of 100% for the B-mode combined with color Doppler ultrasound in the detection of carotid paragangliomas compared with CT/MRI. However, the difference in maximum diameter of the lesions measured at ultrasound versus CT/MRI was significant (p=0.008), ranging between – 5 mm and + 16 mm (mean difference 2.2±6.0).

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Figure 1. B-mode ultrasound imaging of the right-sided carotid paraganglioma. The tumor is oval, well-defined, inhomogeneous, hypoechoic. Cranio-caudal diameter has 21.5 mm and transversal diameter has 28.3 mm.

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In our case the diagnostic of carotid body tumor was firstly established at ultrasound exam. An oval, well-defined, inomogenous, hypoechoic and hypervascula-
rized structure was observed at carotid bifurcation on the right side of the neck (Figure 1 and 2) and on the left side as well (Figure 3 and 4). Figure 4 is indicating a CBP of Shamblin class III, with complete surrounding of the carotid arteries. In Figure 5 it is illustrated the attachement of CBP on the entire proximal wall of the left internal carotid artery in longitudinal view. Figure 6 is emphasizing that the flow is still normal in left internal carotid artery despite the adjacent invasion of the tumor.

After three years of follow-up the patient did not proceed to surgical correction of the bilateral CBP taking into account that the tumors are asymptomatic,
Ultrasound imaging of carotid paraganglioma with very slow grow and the risk of intervention is significantly high.

Conflict of interest: none declared.

References