A Rare Case of Carotid Body Tumor Presenting with Internal Carotid Artery Blood Supply and Carotid Sinus Syndrome

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To the Editor: Carotid body tumor (CBT) is a highly vascular neoplasm of neural crest origin arising in paraganglial cells of the carotid bifurcation. Branches from external carotid artery or glomic artery arising at the bifurcation of common carotid artery dominate in the blood supply mode. Only very few cases with supplementary blood supply from an internal carotid artery (ICA) have been reported in literature, but were still short of imaging proof.[1,2] Here, we report an extremely rare case of CBT with blood supply from ICA, which had been performed 4 times of unaccomplished surgical explorations before the tumor was excised during the 5th time of surgery. She also presented carotid sinus syndrome that was also extremely rare among CBT patients.

A 52-year-old woman was admitted to the Department of Otolaryngology Head and Neck Surgery with a history of neck mass on the right side for 25 years and 4 times of surgical explorations. She felt dizziness when the mass had grown for 20 years, experienced palpitation and vomiting once 5 years ago when she was working in the field, faintness and falling to the bed twice at later time, but never had vertigo. Physical examination revealed a mass sized 8 cm × 10 cm in the right neck. Enhanced computed tomography (CT) angiography and digital subtraction angiography demonstrated a mass located at carotid bifurcation with rich blood supply germinated from ICA stump, the distal end of ICA was almost obstructed [Figure 1a and 1b]. Routine electrocardiogram revealed no abnormalities. Matas test was unable to be carried out because the tumor was so large, extending from the right skull base to the supraclavicular fossa, which made a tangible compression infeasible, while balloon occlusion test proved that a temporary 30 min occlusion of ICA brought about no significant symptoms and signs of neurological or sensorimotor system, preoperative embolization was not routinely carried out.[2]

During surgery, the internal jugular vein, vagus nerve, hypoglossal nerve and sympathetic trunk were preserved. The ICA and external carotid arteries were hard to free from surrounding tissues, and a carotid artery bypass was also not easy to put into the carotid artery. When the ICA was cut across, the blood oozed out very slow rather than ejaculated [Figure 1c]. Based on the occlusion test results, the carotid arteries including internal, external and common carotid artery were ligated. The patient was followed for 2 years and was found to be free from previous dizziness or faintness.

A temporary choking that presented before surgery lasted for half an year after surgery, permanent right vocal cord paralysis and slight ptosis on the right side were also observed. The postoperative CT angiography and cervical vascular duplex demonstrated no further significant abnormality though interruption of the carotid artery persisted.

CBTs are asymptomatic in the majority of cases. In rare instances, they may cause vague symptoms related to the compression of...
the nerves of the region. The clinical symptoms characteristic of a carotid sinus syndrome (i.e., repeated fainting and falling), which are believed to be associated with carotid sinus nerve or Hering’s nerve, in turn, a branch of the glossopharyngeal nerve, if disappear after the surgical removal of the tumor, constitute a unique case.\[^{1}\]

The blood supply of this CBT is mainly derived from ICA, which is quite different from usual cases.\[^{3}\] Did the repeated surgery change the blood supply of the tumor? We could suppose that the peripheral vascular branches might be ligated during the repeated surgical exploration, then new blood supply might grow either from the external or ICA. If most of the branches from external carotid artery were interrupted, which in turn made the main part of the tumor keep attached to the ICA, new blood vessels derived from ICA become possible, then the tumor ends up with the major blood supply from ICA with the tumor growth and erosion into the ICA.

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**Conflicts of interest**
There are no conflicts of interest.

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