Preoperative embolization of a carotid body tumor using Onyx

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INTRODUCTION

Paragangliomas of the carotid body are rare, highly vascularized tumors of neural crest origin. They are usually benign but locally destructive tumors presenting at any age². In 1743, von Haller described the carotid body for the first time³. The carotid body is located at the common carotid artery bifurcation and is typically fed mainly from the external carotid artery⁴.

Carotid body tumors usually present as an slow-growing neck masses. They are typically movable from side to side but not vertically downward⁵. Shamblin et al. introduced a classification system based on tumor size and the degree of involvement of the internal carotid artery⁶. Surgical treatment is always associated with the risk of damage to major vascular structures and to cranial nerves. Preoperative diagnosis is essential to avoid major surgical complications. Resection of carotid body tumors is technically difficult especially in Shamblin III tumors. Embolization reduces morbidity and mortality and shortens the time of surgery by reducing intraoperative bleeding.

Embodilation is usually performed through the transarterial route, however, transarterial embolization often does not lead to a complete devascularisation because of the complex angioarchitecture with multiple small feeding branches and possible vasospasm. Direct intralesional embolization provides an access to a carotid body tumor with a higher chance of achieving complete devascularisation and therefore plays an important role in the preoperative treatment of highly vascularized tumors.

The aim of the present study was to describe the advantages and potential adverse effects of preoperative direct intralesional embolization of a carotid body tumor using the nonadhesive, nonacrylic liquid polymer agent Onyx (ethylene-vinyl alcohol copolymer; Micro Therapeutics, Irvine, CA).

CASE REPORT

A 20-year-old woman presented with a swelling of the right side of the neck of one year duration. The clinical examination was unremarkable except for the swelling. MRI imaging revealed a well-defined heterogenous mass at the region of the carotid bifurcation, which exhibits intense contrast enhancement after intravenous administration of gadolinum (Fig. A, B). A strong vascularity of the tumor and a separation of the internal and external carotid artery with a posterior displacement of the internal carotid artery were evident on the angiography (Fig. C). Moreover it shows a tumor blush pathognomic for paragangliomas (Fig. D).

The diagnosis was a 7x3x4cm right-sided carotid body tumor of Shamblin class III engaging from carotid bifurcation to jugular foramen with a cervical extension into jugular foramen. After diagnostic imaging preoperative direct intralesional embolization with 20mL Onyx was performed. Three hours later, the patient described right-sided oral paraesthesia, ten hours after the intervention the patient showed symptoms of Horner’s syndrome and deficits of the hypoglossal and glossopharyngeal nerves. Twelve hours after embolization the patient underwent planned surgery. Intraoperative findings of a carotid body tumor engulfing the carotid vessels (E) and a massive swelling of the hypoglossal nerve (F).

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REFERENCES

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