Embolisasi partikel pre-operasi *carotid body tumour*

Presurgical particle embolization of left carotid body tumour

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Keywords: carotid body tumour, paraganglioma, tumor embolization

ABSTRACT

A 35-year-old female patient presented with tingling sensation on the both sides of neck and head from last 6 months. MRA neck showed bilateral carotid body tumour extending to base of skull on left side causing attenuation of bilateral external carotid artery (ECA) and internal carotid artery (ICA) within the mass. Patient underwent excision of right carotid body tumour and is now admitted for excision of the tumour on the left side. The tumour was embolized without further complications. The present case indicates that embolization is effective technique for presurgical procedure.

Kata kunci: tumor carotid body, paraganglioma, embolisasi tumor

ABSTRAK

Seorang wanita 35 tahun datang dengan paresthesia pada kedua sisi leher dan kepala sejak 6 bulan yang lalu. Pemeriksaan MRA leher menunjukkan tumor carotid body bilateral yang menjalar hingga basis cranii sisi kiri dan menyebabkan atenuasi dari external carotid artery (ECA) dan internal carotid artery (ICA) bilateral di dalam massa. Pasien telah dilakukan eksisi tumor carotid body kanan dan sekarang direncanakan untuk eksisi tumor sisi kiri. Tumor diembolisasi tanpa komplikasi lebih lanjut. Kasus ini mengindikasikan bahwa embolisasi merupakan teknik efektif untuk prosedur pre-operasi.

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INTRODUCTION

Carotid body paraganglioma (CBP) are rare neoplasm, commonly benign, account for only 0.5% of all body tumours, but still constitute 60-70% of Head and Neck paraganglioma, they mimic other paragangliomas of the body (glomus jugulare, glomus tympanicum, and pheochromocytoma). Malignant changes occur in 6-12% of cases which ranks CBP as the most frequently occurring malignant head and neck paraganglioma.[1]

Presurgical embolization of paragangliomas (glomus tumors) is widely used to devascularize glomus tumors in any location of the head and neck. The most commonly employed materials for embolization are Gelfoam and polyvinyl alcohol (PVA) foam. The use of Gelfoam is rather limited because of its rapid reabsorption rate. PVA is biocompatible, nonabsorbable, and causes effective tumor devascularization.[2,3]

We describe a case of left carotid body tumour with presurgical embolization using PVA particles.

CASE REPORT

A 35 years old female patient presented with tingling sensation on the both sides of neck and head from last 6 months. Neck Magnetic Resonance Angiography (MRA) showed bilateral carotid body tumour extending to base of skull on left side causing attenuation of bilateral external carotid artery and internal carotid artery within the mass. Patient underwent excision of right carotid body tumour on 31-7-2009. Patient is now admitted for excision of the tumour on the left side. On examination: HR 70/min; BP 120/80 mm Hg. Consciousness, orientation, cranial nerves, motor system, and sensory system were normal. She underwent a presurgical embolization procedure.

Right external carotid artery angiogram showed a small tumour blush. Left external carotid artery angiogram showed a dense tumour blush which was fed by the carotid body branch from the Left Common Carotid Artery bifurcation, the ascending pharyngeal artery and the posterior auricular branch of the occipital artery.

Then, the above mentioned arteries were selectively catheterized using Transcend 0.14 microguidewire and a Tracker Excel 14 microcatheter. Then using PVA particle of 45-150 and 250-355 microns the tumour was selectively embolized until minimal residual tumour blush was present at the inferior pole of the tumour.

Post procedure check angiogram did not reveal any abrupt arterial cut off in the Left Internal Carotid Artery

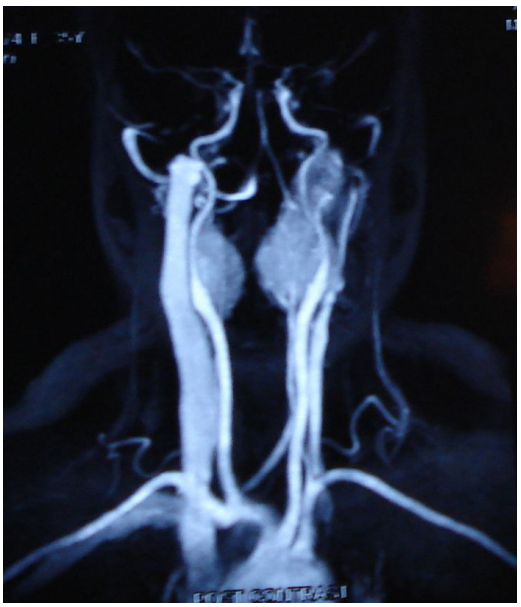
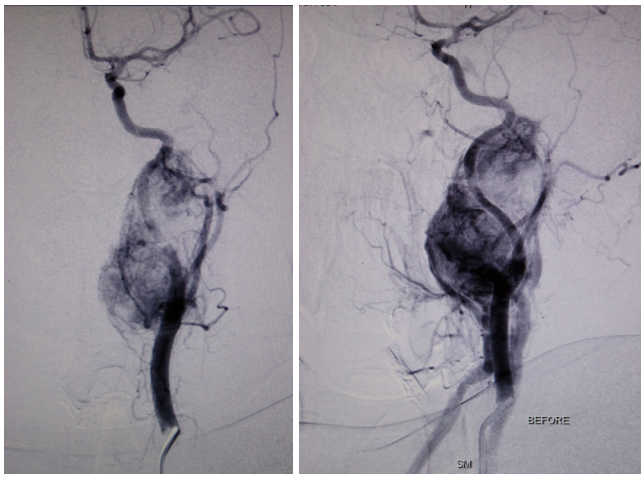


Fig. 1. MRA of patient's bilateral Carotid Body Tumor



a b

Fig. 2. Angiogram of patient's Carotid Body Tumor, a. Early blush, b. Dense tumor blush

circulation. Post procedure the patient remained stable without any neurological deficit, peripheral pulses were palpable, there was no groin hematoma.

DISCUSSION

Surgical excision is the mainstay of treatment of CBT. Adverse outcomes of surgical treatment including peri-operative death and stroke, cranial nerve injury, and bleeding complication. Cranial nerve XII is the most frequently injured (9.6%), followed by CN X (8.1%). Preoperative embolization aims to reduce blood loss in patient undergoing CBT excision.[4] This procedure was first performed by Schick et al.[5] Recent meta-analysis showed that there was no significant mean blood loss difference between patient who had preoperative

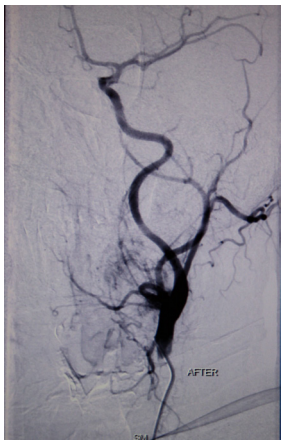


Fig. 3. Embolized Carotid Body Tumour

embolization (639 mL; range of mean values 0-1123 mL) and those who did not (653 mL; range of mean values 110-855 mL).[4] In contrast, meta-analysis by Jackson et al. suggest that blood loss in patients who received preoperative embolization was significantly lower compared with those of surgical excision only. One of the preoperative embolization advantage is reduction in operative time.[6]

Although the benefit of preembolization is still in the matter of debate, preembolization prior to CBT excision is considered safe. No difference was found on TIA, stroke, and CN palsy between patients who received preembolization prior to CBT excision and patients who did not receive preembolization.[7] However, length of stay could be longer when preembolization conducted. This could lead on costlier hospitalization.[8]

According to Pauw et al.[3], four histologic postembolization stages can be identified:

a. Stage I (early thrombus formation): 2 days after embolization is characterized by thrombus formation.
b. Stage II (complete thrombus formation): 3 to 7 days after embolization there is proliferation of the intima into the vessels, ingrowth of fibroblasts in consolidated and organized thrombi, and appearance of multinucleated foreign body giant cells with active phagocytosis. The lumen of the vessel is totally obstructed by cellular elements, consolidated fibrin network and embolic material, still without any sign of revascularization.
c. Stage III (partial revascularization; 9 to 16 days postembolization): The embolization particles undergo fragmentation and inclusion in cytoplasm of multinucleated giant cells. Of the embolized vessels, 30% undergo partial revascularization.
d. Stage IV (complete obliteration: more than 2 months postembolization): Of the embolized vessels, 40% are completely obliterated but still present, in many

instances, with an endothelial lining, and 30% of the 42 vessels are still partially revascularized.

Two techniques can be used for this purpose: superselective catheterization of the supplying branches and transarterial embolization with particulate agents or a permanent liquid polymerizing agent, and direct intratumoural injection of a permanent liquid polymerizing agent, a technique initially described in 1990 by Deramond.[9]

Presurgical embolization has been acclaimed by many investigators as a useful adjunctive tool in the surgical management of paragangliomas. Shrinkage in tumour vascularity and size, with a consequent decrease in intraoperative blood loss, is the goal. It is believed that a tumour larger than 3 cm is ideally suited for embolization. In a multicompartment tumour, each compartment is "hemodinamically independent" (ie, individual feeding vessels opacify only the compartments supplied by them). In contrast, one or more feeding vessels may supply a monocompartment paraganglioma, and each artery will supply the entire mass. Most paragangliomas (83%) have a multicompartment pattern of vascularity. To completely embolize a paraganglioma, all the feeding vessels must be occluded. Most arteries can be embolized using PVA particles,typically varying from 140 to 250 micron in size. In monocompartment tumours, the entire tumor may be successfully embolized through a single feeding vessel by using a liquid embolization material under optimal conditions. The success rate for preoperative embolization (as defined by decreased in tumour size) is estimated at about 80%.[10] The recommended delay between embolization and surgery should be at least 1-2 days to allow embolization-related local oedema to decrease but no longer than 2 weeks to avoid recanalization of the feeding vessels. The choice of the optimal embolic agent depends on the hemodynamic and angioarchitectural factors.[9]

CONCLUSION

This case represents patient with preoperative embolization of left carotid body tumor. Angiography is required preoperatively in larger paragangliomas for surgical planning and often for preoperative embolization. The prognosis is directly related to the location of the tumor. Patients with paragangliomas arising at the carotid body have the best outcome.

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