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Paraganglioma of Carotid Body: A Case Report

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Authors' contributions

This work was carried out in collaboration between all authors. Author HP designed the study, wrote the protocol and wrote the first draft of the manuscript. All authors read and approved the final manuscript.

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Case Study

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ABSTRACT

Paraganglioma occur from the paraganglionic stems of the autonomic nervous system. They develop from the carotid body and are known as carotid body tumours. These are sporadic, rare vascular lesions showing genetic transfer. Although they are generally benign and have a slow course, because of invasion to adjacent neurovascular tissues or pressure, early diagnosis and treatment is of importance. Diagnosis is made from a detailed history and physical examination and is confirmed with angiography. The treatment method selected in the majority of cases is surgery. In this paper, the case is presented of a 73-year old female who underwent surgery in our clinic for a diagnosis of carotid body paraganglioma.

Keywords: Carotid body; paraganglioma; surgery.

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1. INTRODUCTION

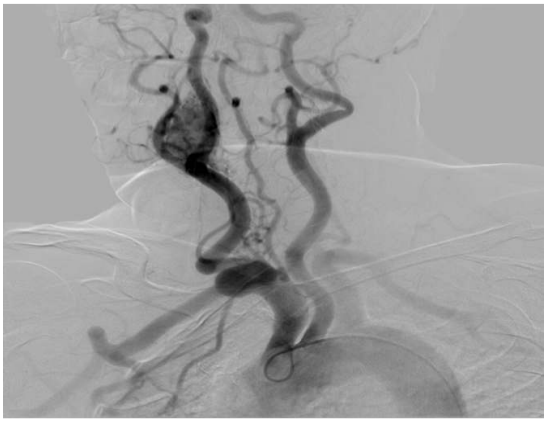
Carotid body paraganglioma is a rarely seen tumour originating from neuro-ectodermal tissue, which is located in the carotid bifurcation [1]. It is generally a slow-growing benign tumour [2]. As the size of the mass increases, so the potential for malignancy increases, pressure is applied on the adjacent neurovascular structures, the surgical technique is made more difficult and the risk of complications inceases [3-6]. Therefore, diagnosis must be made and surgical treatment planned in the early stage [1].

2. CASE REPORT

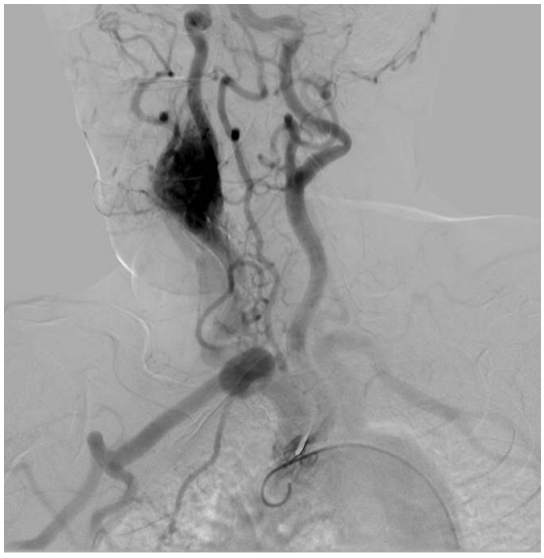
A 73-year old female presented at the polyclinic with the complaint of swelling on the right side of the neck, which had been ongoing for 1 month. In the physical examination, an immobile mass was determined, 3.5 x3 cm in size with regular borders, located on the right side of the neck immediately behind the mandibular angle and extending as far as the earlobe. There were no findings of cranial nerve involvement. On the ultrasonographic (US) examination, a heterogenous, densely vascularised, solid mass was observed with dimensions of 35 x 30 x 20 mm, which had regular lobular contours and was displacing vascular structures in the right carotid bifurcation. On contrast computed tomography (CT) of the neck, a mass was observed approximately 32 mm in diameter, adjacent and anterior to the right jugular vein. On the bilateral selective carotid angiographic examination, a mass was seen in the carotid bifurcation on the right side of approximately 3.5 cm diameter. The mass was seen to be nourished from the parapharyngeal collateral vascular structures with approximately 30% of the superior-lateral part originating from the posterior auricular-occipital artery (Figs. 1a, b).

The patient was admitted for surgery under general anaesthesia. The neck region was explored with a double parallel skin incision into the sternocleidomastoid muscle in the right side of the neck. Cranial nerves were carefully exposed. The tumour, 3.5 x 3 cm in size, located between the carotid interna and externa was completely excised protecting the arteries and nerves.

The pathological examinatioon reported the mass as paraganglioma (Figs. 2a, b). No neurological complication was encountered in the postoperative follow-up. Throughout the 27-month follow-up period, the patient was problem-free and no recurrence was observed.



1(a)



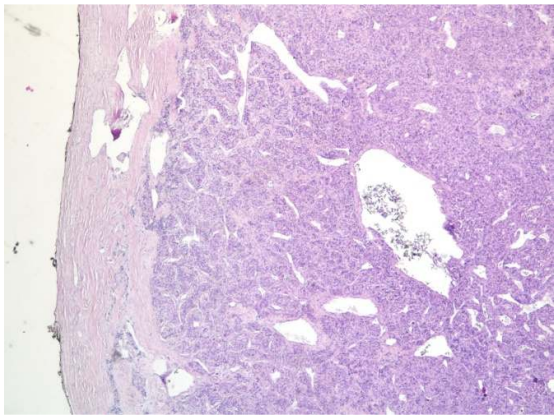
1(b)

Fig. 1. Right carotid angiography at the level of the carotid bifurcation
a: in the early arterial phase, a mass lesion with regular contours showing heterogenous contrast of moderate intensity
b: in the late arterial phase, a mass lesion showing intense contrast enhancement

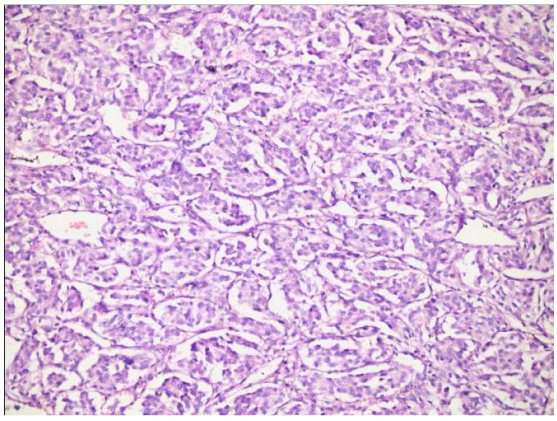
3. DISCUSSION

Carotid body paraganglioma originate from the paraganglion cells in the carotid bifurcation and is the most commonly seen form of paraganglioma of the head and neck [1]. They are generally sporadic [7]. There is no difference

between the genders and peak incidence is seen at 40-50 years of age [1]. The majority are benign in character and non-functional. Growth is generally slow and until a certain size is reached they are asymptomatic [2]. As seen in the case presented here, 75% of patients present with a slow-growing painless mass on the neck. When the mass continues to grow, pressure on adjacent neurovascular structures results in symptoms being seen such as difficulty in swallowing, restricted hearing and pain in the ears. In those that are functional, symptoms may emerge asociated with catecholamine expression [8].



2(a)



2(b)

Fig. 2. Histopathological image of the paraganglioma
a: the overall picture (Hematoxylin-Eosinx40)
b: Zellballen pattern of paraganglioma (Hematoxylin-Eosinx200)

In the preoperative differential diagnosis, causes of the mass to be considered should include bronchial cysts, saliva gland tumours, carotid artery aneurism, lateral aberrant thyroid gland, malignant lymphoma, neurofibroma, tuberculous lymphadenitis and metastatic carcinoma [2]. US, CT, MRI and angiograph are useful in the diagnosis [1]. Angiography is extremely important in respect of understanding the specific arterial anatomy and also providing the means of vascular control intraoperatively [7]. In the case presented here, definitive diagnosis was made with angiography.

Although the mass is generally benign, malignancy may develop in 3%-12.5% of cases which have been diagnosed late [9].

Carotid body tumours were classified by Shamblin et al. [9] into 3 types according to size:

Localised mass
Surrounding the carotid artery
Completely wrapped around and adhering to the carotid artery.

The ideal choice of treatment is surgery. Removal of the tumour with careful subadventitial dissection should be selected in Shamblin types 1 and 2. The tumour in the current case was a Shamblin type 1 and the mass was excised with good surgical borders. If the mass is not completely excised, recurrence develops at a rate of 10% [1]. In tumour resection, mean rates of mortality are seen at 2%, perioperative stroke at 2-3% and cranial nerve dysfunction at 40% [10].

4. CONCLUSION

In conclusion, these tumours which are not often seen, must be diagnosed in the early stage because of the complex relationships with adjacent structures and they must be treated surgically [11-12]. Otherwise, the potential for malignancy and pressure symptoms may lead to life-threatening complications.

CONSENT

All authors declare that ‘written informed consent was obtained from the patient (or other approved parties) for publication of this case report and accompanying images.

ETHICAL APPROVAL

All authors hereby declare that all experiments have been examined and approved by the

appropriate ethics committee and have therefore been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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