CAROTID BODY TUMOUR

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INTRODUCTION

Carotid body tumours are usually benign lesions. Carotid bodies are located on the posteromedial wall of the common carotid at its bifurcation and measures 3 to 5 mm. the feeding vessels primarily run from external carotid artery. Its function is related to its role in the autonomic control of the respiratory and cardiovascular systems. Hypercapnoea, hypoxia or decreasing ph stimulate specialized cells in the carotid body to initiate an autonomic reflex which leads to increased respiratory rate and depth, increased heart rate, systemic vascular tone and blood pressure. Surgical excision of the tumour alone or with concomitant carotid artery resection is the mainstay of treatment [1].

CASE REPORT

A 29 year old soldier presented with one year history of a painless progressively enlarging lump in the right side of the neck with six months history of headaches. His systemic examination revealed raised blood pressure (180/110 mmHg) loud aortic component of the second heart sound and grade 1 hypertensive retinopathy. Rest of the systemic examination was non-revealing. Examination of the neck revealed palpable mass, 4.5 x 4 cm in the right submandibular region at the level of hyoid bone anterior to sternocleidomastoid mobile from side to side.

Full blood count, ESR, sugar, urea & electrolytes, liver function tests, thyroid function tests, USG abdomen were normal. Twenty four hour urinary VMA was raised (33 Um/24 hours). Fine needle aspiration cytology was inconclusive. The ultrasound reported a normal thyroid gland and a well defined mass of mixed echogenicity lying in the bifurcation of the right common carotid artery. CT scan of the neck showed fairly well defined rounded soft tissue attenuation mass in the right sub-mandibular region measuring approximately 4.5 x 4 x 3.2 cm. The interface between the mass and gland was distinct. It extended along the right side of neck up to the level of the upper part of the thyroid cartilage. Laterally the lesion lied in relation to the right sternocleidomastoid muscle. Right internal and external carotid arteries and internal jugular vein were not visualized throughout the length of the lesion and seemed to be displaced by the mass (fig. 1). Carotid angiography revealed classic widening of the carotid bifurcation by a well-defined tumour blush ("lyre sign") (fig. 2). Renal and coronary angiograms were also done and were normal. During right carotid angiogram his blood pressure rose to 210/120 (fig. 3). Subsequently the tumour was successfully removed and histopathology confirmed paraganglioma originating in the carotid body.

DISCUSSION

The carotid body is involved with the chemoreceptor control of respiration, blood pressure, and heart rate. Malignant growths in this area are classified as paragangliomas or chemodectomas. Carotid body tumours vary in incidence from 7-29 % of para-pharyngeal tumours. The incidence increases to 79% at high altitudes [2]. CBT can be unilateral or bilateral & 10% are familial. There is female gender preponderance noted 8.3:1 at high altitude as compared to a modest one of 2:1 in lower altitude. The average age of presentation is between 35 to 50 years [3]. A history of uncontrolled hypertension, tachycardia, facial flushing or excessive

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sweating may point towards a catecholamine secreting tumour [4]. This finding was in conformity with our patient. Differential diagnosis includes parotid neoplasm, branchial cleft cyst, lymphoma, metastatic carcinoma or schwannoma.

Microscopically, the tumour is extremely vascular and poorly encapsulated. A network of capillaries and areolar tissue arranged in concentric circles is seen. The neovascularization encroaches upon and eventually encompasses the carotid bulb and extends along the carotid artery for long distances drawing blood from the vasa vasorum. The carotid system becomes progressively distorted but is never occluded. CBT histologically consists of two types of cells- the chief cells and the sustentacular cells. The presence of supporting cells points to the benign character of the tumour. CBT rarely show malignant transformation and histological diagnosis of this is difficult. A genetic etiology is suggested by the familial occurrence and environmental factors.

If clinical suspicion of CBT is present, a biopsy should not be attempted because it is unnecessary and dangerous as it can lead to severe bleeding [5]. However some workers suggest FNAC to be the diagnostic modality of some clinical significance [6] and in our case, however, FNAC was carried out with inconclusive results. This could possibly be due to inadequate sample specimen. MRI/CT/MRA provides a detailed mapping of the vascularity [7]. Carotid angiography is by far the most useful diagnostic test for CBT [8]. This modality can establish the diagnosis, demonstrate multiplicity of lesions, determine the size and tumour blush and evaluate the tumour blood supply. Additionally it can be modified to include selective, controlled balloon occlusion of the internal carotid artery to evaluate the cerebral cross flow. This information is extremely important in pre-operative planning and counseling of the patient as to the relative risk of surgery. We carried out selective bilateral carotid

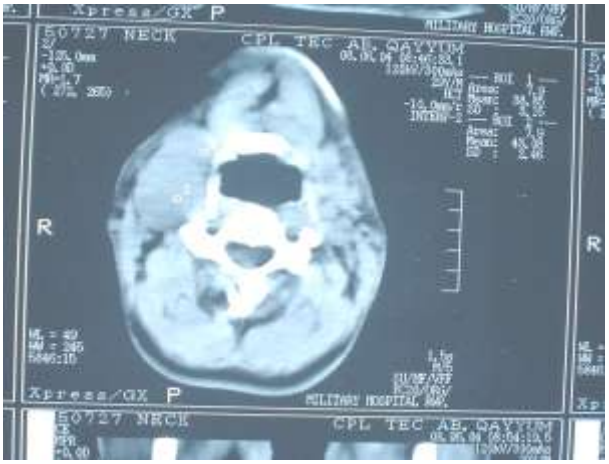

Fig. 1: CAT scan of the neck showing CBT in right submandibular region.

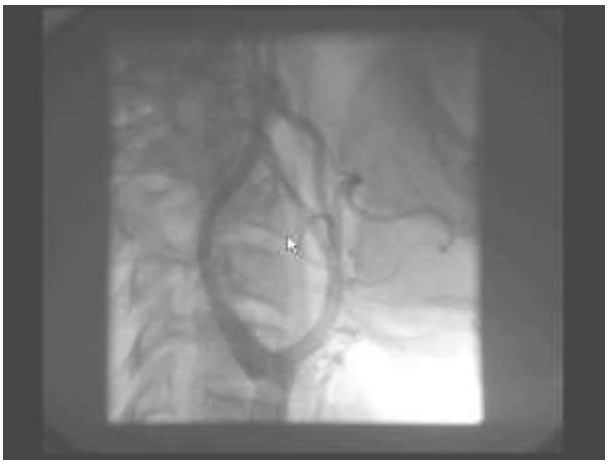

Fig. 2: Tumour blush splaying right ICA & ECA.

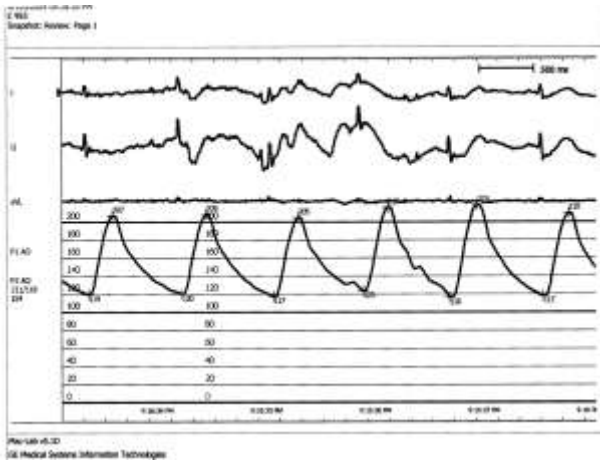

Fig. 3: Blood pressure rise during carotid angiography.

angiography. The classic pathognomonic finding on arteriogram is widening of the carotid bifurcation by a well defined tumour blush [8] (fig. 2). Routine screening for urinary metanephrines and VMA and serum

catecholamines is only indicated for multiple or familial paragangliomas or in the presence of catecholamine related symptoms [9]. Our case showed increased 24 hour urinary VMA suggesting catecholamine related secretory tumour. However considering the hazards associated with operating on a previously unsuspected, metabolically active tumour an argument can be made for obtaining these studies in all cases. Our patient experienced a sudden acute rise in blood pressure with accompanying severe headache probably due to stimulation of secretory tumour by ionic contrast load.

Multiple surgical approaches have been adopted worldwide like cervico-parotid approach, lateral transcervical approach and even mandibulotomy for complete resection. Our patient was proceeded with cervico-parotid approach with complete resection and excellent post operative results with normalization of blood pressure [10,11].

CBT though rare can present a clinical challenge in the diagnosis which is usually confirmed by CAT/MRI/MRA and also by carotid angiography. Once the diagnosis is established, surgical resection can be curative. In secretory tumours presenting with raised blood pressure, surgical treatment can be curative as far as increased blood pressure is concerned.

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