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Case Report

Retroperitoneal non-functioning paraganglioma: A case report

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Abstract

Objectives: Retroperitoneal paragangliomas are relatively rare endocrine tumours derived from the extra-adrenal paraganglia of the autonomic nervous system. They can be functional when they secrete catecholamines or non-functional. The diagnosis of a paraganglioma is infrequently made preoperatively unless the tumour is functional.

Case report: A 54-year-old woman with a past medical history of viral hepatitis, presented with vague abdominal pain of five years' duration. On examination, no abdominal mass was palpable and her blood pressure was 100/60 mm Hg. Abdominal computed tomography scan demonstrated a well-defined hypervascular retroperitoneal mass of heterogeneous density in the left para-aortic region measuring 3cm in diameter. As paraganglioma was suspected preoperatively, serum and urine cathecholamine levels were performed and were within normal range. Complete surgical excision of this mass was performed. Histological examination of the surgical specimen coupled with immunohistochemical study was consistent with the diagnosis of pararganglioma.

Conclusions: Retroperitoneal paragangliomas are most commonly benign with good prognosis, but can be locally invasive and metastasize as well. The possibility for malignant transformation of paragangliomas makes surgical excision the treatment of choice.

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INTRODUCTION

Paragangliomas are relatively rare endocrine tumours that arise from paraganglionic tissue, a widely dispersed collection of specialized neural crest cells [1]. They account for 10% of adult pheochromocytomas. About 70% of sympathetic paragagliomas are intra-abdominal, usually found in the perinephric and paraaortic spaces. The remaining 30% are located in the chest. Paragangliomas can be functional when they secrete catecholamine or non-functional.

In the absence of typical symptoms of catecholamine excess, the diagnosis of such tumours is a significant challenge, and it is usually delayed until an advanced stage of the disease [2]. Approximately 50 cases of non-functional retroperitoneal paragangliomas were reported in the literature. In this paper, the authors report a new case of non-functional retroperitoneal paraganglioma that was revealed by abdominal pain.

CLINICAL HISTORY:

A 54-year-old woman with a past medical history of viral hepatitis, presented with vague abdominal pain of five years' duration. She had no symptoms related to catecholamine excess such as headache, palpitations and diaphoresis. On examination, no abdominal mass was palpable. She had no history of hypertension and her blood pressure was 100/60 mm Hg at the time of admission. The rest of physical examination was unremarkable. Abdominal ultrasonography showed a left para-aortic hypoechoic lesion. Abdominal computed tomography (CT) scan showed a 3 cm, well-defined hypervascular retroperitoneal mass of heterogeneous density in the left para-aortic region and lying inferior to the left kidney (figure 1). According to the CT scan findings, a paraganglioma was suspected preoperatively. Consequently, serum and urine cathecholamine levels were performed but they were within normal range. Complete surgical excision of the mass was performed successfully through a midline

laparotomy incision. Macroscopic examination of the surgical specimen revealed a soft and encapsulated nodule measuring 2.9 x 1.5 cm. The cut surface of this nodule was yellowish and showed areas of hemorrhage. Histological examination revealed a well-circumscribed and encapsulated tumour arranged in nests and clusters of tumour cells surrounded by a delicate capillary network. Tumour cells were almost uniform in appearance with round-to-oval nuclei and finely stippled chromatin (figure 2) and occasionally showed nuclear pleomorphism or bizarre nuclei (figure 3a). They had abundant eosinophilic and finely granular cytoplasm. Mitotic figures were scarce: 1 mitosis per 10 high power field (HPF). Immuohistochemical study demonstrated that the tumour cells strongly expressed chromogranin A and synaptophysin, but were negative for cytokeratin (figure 3b). The final pathological diagnosis was retroperitoneal paraganglioma. Postoperative course was uneventful over 6 months of follow-up.

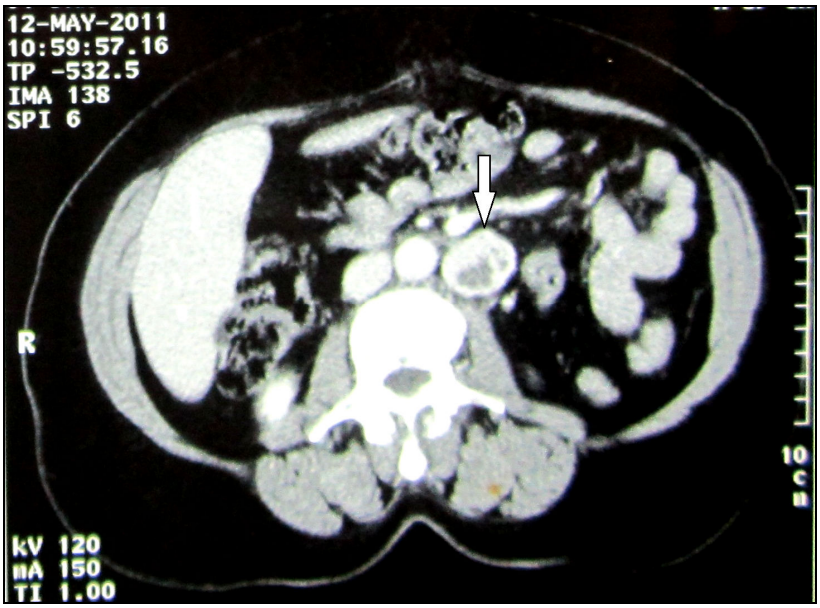

Figure 1. Abdominal CT scan showing a hypervascular left para-aortic retroperitoneal mass (arrowhead).

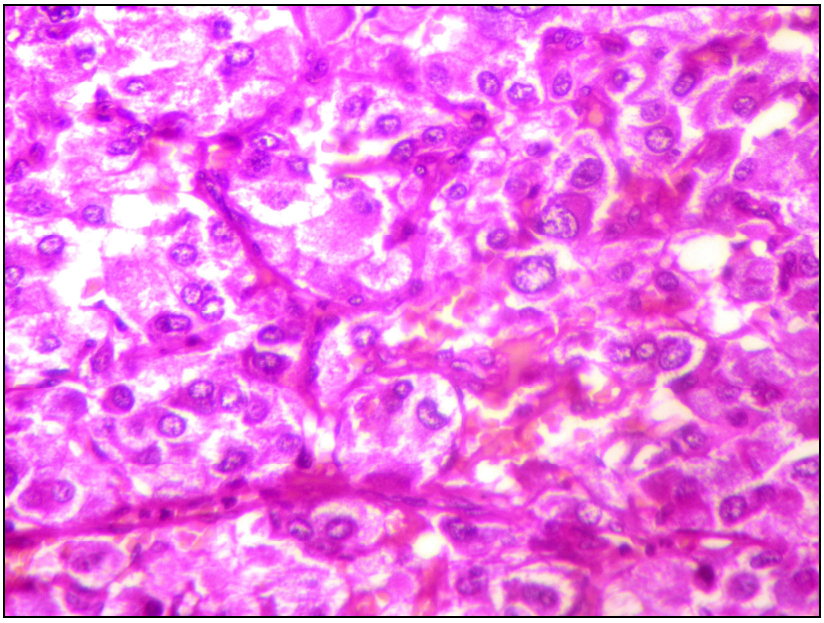

Figure 2. Tumour cells are large and have a finely granular eosinophilic cytoplasm. They are surrounded by a delicate capillary network (H&E, x 400).

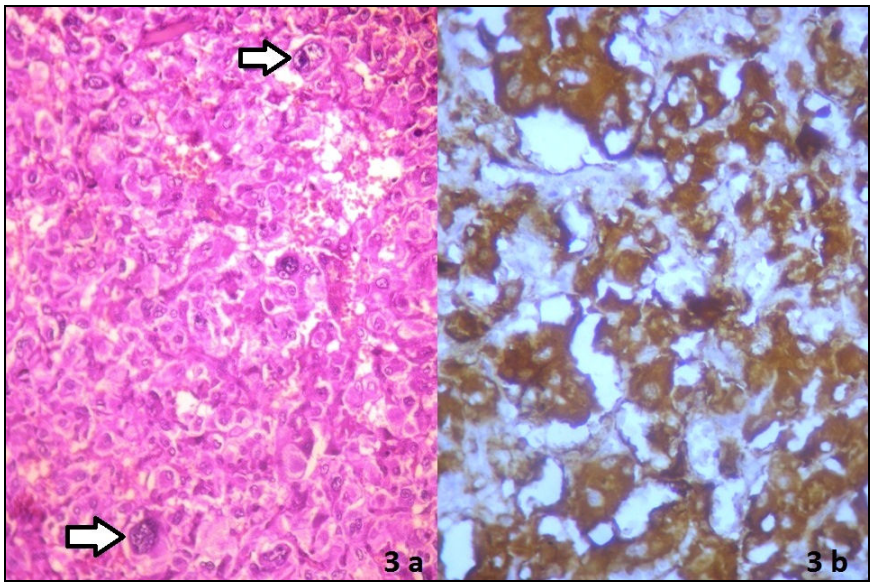

Figure 3a: Tumour cells occasionally showed nuclear pleomorphism or bizarre nuclei (arrows) (H&E, x 200).
Figure 3b: Diffuse immunostaining for chromogranin A. (immunohistochemistry, x 400).

DISCUSSION

The 2004 WHO classification of endocrine tumours defines pheochromocytoma as a tumour arising from chromaffin cells in the adrenal medulla. Closely related tumours in extra-adrenal sympathetic and parasympathetic paraganglia are classified as extra-adrenal paragangliomas [3-7]. Paragangliomas can be found from the upper cervical region to the pelvis, along the autonomic nervous system. They are most commonly present in the organ of Zuckerkandl at the aortic bifurcation [4,5]. Most retroperitoneal paragangliomas occur in patients 30–45 years of age, although the malignant forms may have an even younger median age [1,2]. Our patient was aged 54 years. Men and women are equally affected in most series [2]. Occasionally these tumours are multiple, or they may be associated with paragangliomas of other sites or with other tumors [7]. Genetic disorders involving mutations within the succinate dehydrogenase B and D units (SDHB, SDHD) and the von Hippel-Lindau (VHL) gene place an increased risk in the development of extra-adrenal paragangliomas and adrenal pheochromocytomas, respectively [8]. Patients with non-functioning retroperitoneal paragangliomas are usually asymptomatic until the tumour reaches sufficient size to produce symptoms of compression on adjacent organs. Typical symptoms include abdominal pain in 50% of cases as it was the case in our patient, nausea, vomiting, abdominal distension and weight loss [9]. Patients with functional paragangliomas undergo paroxysmal episodic hypertension, as well as palpitations, headache and profuse sweating [10,11]. On CT scan, retroperitoneal paraganglioma appears as a hypervascular mass. Areas of intra-lesional hemorrhage and necrosis can be frequently seen as the tumour enlarges. MRI is more sensitive than CT scan in detecting extra-adrenal tumors. Scintigraphy with 123-I labeled MIBG offers superior specificity than CT and MRI imaging [12,13]. The possibility for malignant transformation of paragangliomas makes surgical excision the treatment of choice. Radiation therapy has been advocated for patients who cannot undergo surgery or for unresectable tumours [10]. Therapy with radionucleotides may be used for tumors exhibiting uptake on diagnostic scan [4]. Octreotide can be used for treatment of inoperable paragangliomas [14]. Macroscopically, paragangliomas are solid tumours and are partially or completely encapsulated with a thin capsule [7]. The cut surface of the tumour is tan to red-brown, extremely vascular, homogeneous, or focally fibrotic. Larger tumours may show haemorrhage and cystic degeneration. Histologically, retroperitoneal paragangliomas are composed of chief cells which are polygonal or slightly spindled with an amphophilic or eosinophilic cytoplasm. These cells are arranged in short, irregular anastomosing sheets around a delicate vasculature. Hemorrhage in these nests of cells is not infrequent [4,7]. A few retroperitoneal paragangliomas are highly pleomorphic lesions made up of spindled or angular cells with deeply eosinophilic cytoplasm and large hyperchromatic nuclei. Such tumours grow in extremely large sheets and often lack the organization

of the usual paraganglioma. Immunohistochemically, neuron-specific enolase (NSE), synaptophysin, neurofilament protein, and chromogranin can be demonstrated in the chief cells. In addition, the delicate sustentacular network can be demonstrated using antibodies to S-100 protein, and in a few instances these same cells coexpress glial fibrillary acidic protein. A variety of other polypeptides (enkephalin, neuropeptide Y, serotonin, gastrin, substance P, bombesin) can also be demonstrated in chief cells. Because benign and malignant paragangliomas have the same histological appearance, the best predictor for outcome is metastasis or recurrence [2,3,7]. Local tissue invasion or pathological evidence of nuclear pleomorphism or mitotic activity does not necessarily imply malignancy [4,7]. Paragangliomas metastasize approximately in 20% to 42% of the cases [2]. Dissemination can be hematogenous or through the lymphatic system, with the most common site of metastasis being the regional lymph nodes, bone, lung and liver.

In conclusion, our case emphasizes the necessity to include extra-adrenal paraganglioma in the differential diagnosis and management of retroperitoneal tumours, despite its rarity. Imaging studies have greatly contributed to a more accurate diagnosis of paraganglioma. Yet the gold standard of diagnosis remains a pathological one. Lifelong follow-up of patients with retroperitoneal paragangliomas is essential as metastasis and recurrence may occur.

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