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Muhammad Rizwan Khan
Aga Khan University

Rushna Raza
Aga Khan University

Abdul Jabbar
Aga Khan University

Arsalan Ahmed
Aga Khan University

Case Report

Primary non-functioning paraganglioma of liver: a rare tumour at an unusual location

Muhammad Rizwan Khan,[1] Rushna Raza,[2] Abdul Jabbar,[3] Arsalan Ahmed[4]

Department of Surgery,[1,2] Department of Medicine,[3] Department of Pathology,[4] Aga Khan University & Hospital, Karachi.

Abstract

Pheochromocytomas are rare tumours, 22% of which are extra-adrenal and are known as paragangliomas. We report a case of a young male with non-functioning paraganglioma of the liver; a very uncommon primary site. A CT scan with contrast showed a huge, highly vascular mass lesion in the right lobe of the liver and a core biopsy confirmed it to be a paraganglioma. Whole body study with iodine-131-meta-iodobenzylguanidine (MIBG) tracer highlighted the liver tumour but was negative for any other active lesions depicting that the tumour was confined to the liver. The lesion was completely resected by extended right hepatectomy and the patient had an uneventful recovery. There is no evidence of disease recurrence at 3 years of follow up.

Keywords: Paraganglioma, Non-functional, Primary, Liver.

Introduction

Paragangliomas are extra-adrenal pheochromocytomas that arise from paraganglion cell nests along the sympathetic chain extending from the skull-base to the pelvic floor.[1] These tumours, like other neuroendocrine tumours, are hypervascular and usually benign.[2] Patient can present with the clinical picture of catecholamine excess in case of functional tumour or may be completely asymptomatic. About 10% of pheochromocytomas are malignant and about 22% arise from extra-adrenal sites.[1] Few unusual sites have been reported including the gallbladder, biliary ductal system, larynx, lung

and the urinary bladder.[3,4] Primary hepatic site is extremely rare and very few cases have been reported to date.[1,2,5-8] Since hepatic metastasis of pheochromocytomas is more frequent, it is important to exclude the presence of a primary adrenal tumour in these patients.

Case Report

A 24-year old male presented with a 6 weeks history of generalized bodyaches and headaches, low grade fever with chills and sweating. He also complained of intermittent vague abdominal pain associated with episodes of diarrhoea. There was no history of hypertension or weight loss. Past history was not significant except for an episode of enteric fever two years back. On examination he had a soft non-tender palpable liver 3cm below the costal margin. His liver function tests were within normal limits except for elevation of serum gamma-glutamyl transpeptidase (GGT) level to 93 IU/L (normal range: 3-50 IU/L). Blood counts were also normal, although haemoglobin was low at 10.8 mg/dL (normal range: 12.4-16.8 mg/dL) and ESR was 105mm/hr (normal range: 3-13 mm/hr).

An ultrasound of the abdomen done at another hospital revealed a 15x18 cm, heterogeneous, cystic cum solid mass in the liver which was speculated to be a liver abscess. Upon aspiration, haemorrhagic fluid was found and no malignant cells were seen. IHA for amoebiasis, echinococcus serology and fluid cultures were negative. A CT scan of the abdomen with IV contrast was done which showed a huge, highly vascular, 20x18x14 cm size mass in the right lobe of liver which was compressing the inferior vena cava, right and middle hepatic veins (Figure-1). It was showing intense enhancement in arterial phase in the periphery and none in the center. Blood supply was mainly from right hepatic artery. Differentials of giant cavernous haemangioma or angiosarcoma were suggested.

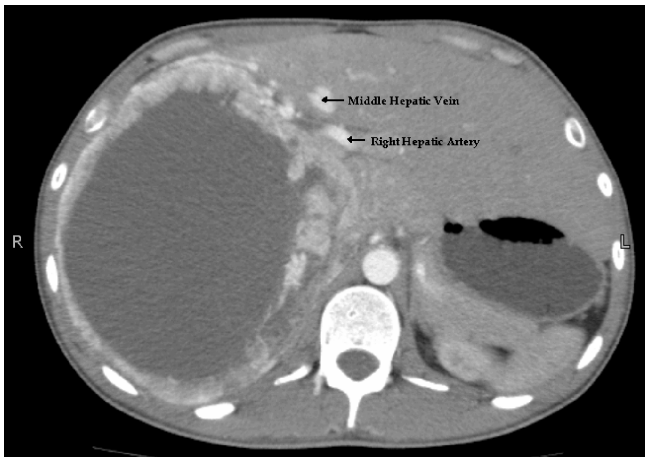

Figure-1: Axial CT scan showing highly vascular giant paraganglioma of liver occupying whole of the right lobe of liver.

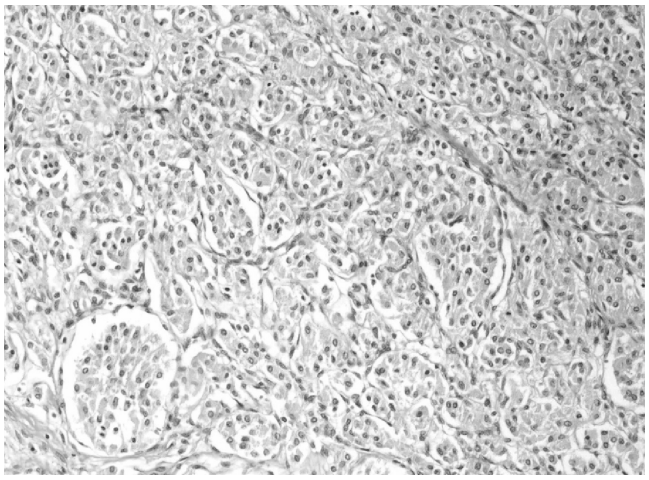

Figure-2: 20X magnified view of histological section of paraganglioma.

An ultrasound guided core biopsy of the lesion was performed. Histopathology revealed a neoplastic lesion with nests of cuboidal cells separated by fibrovascular septae, surrounded by flattened layer of sustentacular cells. Moderate amphophilic granular cytoplasm containing deeply hyperchromatic rounded nuclei were seen with inconspicuous nucleoli. No definitive pleomorphism, increased mitotic activity or necrosis was noted (Figure-2). The neoplastic cells showed negativity for cytoplasmic glycogen on PAS special stain and were positive for Chromogranin and Synaptophysin. On the basis of morphology and immunohistochemical results, a diagnosis of paraganglioma was made.

An endocrinology consult was sought for any syndromic associations, functional component or possibility of metastasis from a primary adrenal or spinal tumour. Sympathetic blockade of alpha or beta receptors was not advised as the patient had no symptoms of functional tumour and urinary vanillylmandelic acid (VMA) levels were within normal limits (2.4 mg/24hr, normal range: 2-7mg/24hr). Serum Calcitonin was < 2.0pg/ml (normal range: 0.8-9.9pg/ml) and serum Calcium level was 9.1mg/dL (normal range: 8.5-10.2mg/dL); therefore multiple endocrine neoplasia (MEN) IIa syndrome was excluded. Whole body study with Iodine-131 MIBG highlighted the liver tumour but was negative for any other active lesions depicting that the tumour was confined to the liver.

In view of the highly vascular nature of the lesion, preoperative angiography and embolization was planned. The tumour showed extensive vascularity, with feeding vessels branching directly from the aorta, right hepatic artery, right adrenal artery and small contribution from superior mesenteric artery. Embolization of direct branches from hepatic artery and adrenal arterial branches was done using polyvinyl alcohol particles. Significant reduction in vascularity was

achieved by embolization with some residual tumour blush from renal artery and superior mesenteric artery.

Three days post embolization, extended right hepatectomy was carried out. As expected, the tumour was still highly vascular involving the right hepatic lobe with multiple collateral blood vessels. Left lobe was hypertrophied with normal texture. Adrenal glands were also normal. Extended right hepatectomy was done and the final histopathology confirmed paraganglioma of liver with clear margins of excision. The lymph nodes recovered at the neck of the gallbladder showed reactive changes without any evidence of malignancy.

Post-operatively, the patient was kept in intensive care unit for 24 hours. Diet was progressed gradually, and he was encouraged to mobilize. Liver function tests and blood count returned to normal limits and he was discharged from hospital in 5 days. He was followed with ultrasound and LFTs every three months and CT scan every year. He remained asymptomatic without any radiological evidence of recurrence at 3 years of follow up.

Discussion

Paraganglioma occurring primarily in the liver is a rarity. This unusual location can be associated with ectopic chromaffin tissue in the liver.[2] Hepatic metastasis of pheochromocytomas from a primary adrenal tumour is a more frequent occurrence.[8] We ruled this out in our case by a negative MIBG and CT scan with IV contrast.

Biochemical evaluation of paraganglioma includes 24-hour urine norepinephrine, epinephrine, metanephrines, normetanephrines, dopamine, and VMA. Plasma metanephrines and normetanephrines can also elicit the diagnosis of familial syndromes, such as multiple endocrine neoplasia Type 2, Von Hippel Lindau or familial paragangliomas. In our case, normal 24-hour urine VMA depicted a non-functional nature of the tumour. It could also be possible that any catecholamines produced by the tumour were being metabolized by the liver. This is more likely if the venous drainage of the tumour is into the portal system.[9]

The differential diagnoses of cystic-solid lesions in the liver are many and should always include a neuroendocrine tumour. Percutaneous preoperative biopsy (fine needle aspiration or core biopsy) should only be done with extreme caution and preparation if a paraganglioma is suspected, as it can potentially result in life-threatening crisis. In our patient, the tumour was essentially asymptomatic and the suspicion of paraganaglioma was very low since the liver is an extremely uncommon site for primary paraganglioma, therefore, a core biopsy with all the precautions was done.

In our patient, the tumour was in the right lobe of liver. It was huge, highly vascular and located in close proximity to the inferior vena cava and middle hepatic vein. Preoperative angioembolization decreased the vascularity of the tumour to some extent, but surgical procedure was still a challenge in this situation. The procedure was carried out successfully in this patient and he made an uneventful recovery. Long-term follow up of pheochromocytomas is usually recommended due to the potential malignant nature of this tumour and likelihood of occult primary lesions.[8] In our case so far the patient has remained asymptomatic without any evidence of recurrence.

Conclusion

In conclusion, the reported patient is a very rare case of primary benign hepatic paraganglioma. The diagnostic and therapeutic approach to this problem has been detailed. The diagnosis was speculated on the CT scan and confirmed by biopsy while VMA and MIBG scan excluded any other primary or metastatic lesion. Chemical embolization followed by extended right hepatectomy eliminated the primary tumour with uneventful recovery of the patient.

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