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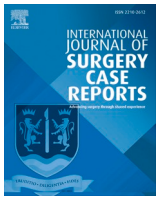

Case report

Hepatic hemangioendothelioma – A rare case report

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ABSTRACT

Introduction and importance: Hepatic hemangioendothelioma (HHE) is a very rare mild-moderate malignant tumor of the hepatic vascular endothelium. The etiology is yet not fully understood. Patients can be asymptomatic or may present with non-specific symptoms or hepatic insufficiency. CT and MRI scans show various radiographic features but a definitive diagnosis can be made with histological analysis and immunohistochemistry. Here we report a case of a patient who presented with a non-resectable disease for which living donor liver transplantation was done.

Case presentation: A 19-year-old female patient presented with intermittent moderate dull pain in the right hypochondrium for 9 months. Examination revealed mild tender hepatomegaly. On abdominal ultrasound, two hypoechoic lesions were noted in both lobes of the liver that were confirmed on CT scan. Histologic examination of the ultrasound-guided fine-needle aspiration cytology of the voluminous right lobe lesion clinched the diagnosis of HHE. The patient underwent successful living donor liver transplantation due to the multifocal bi-lobar nature of the lesions. At 8 months follow up, she is fine and doing well.

Conclusion: HHE is a very rare mild-moderate malignant tumor of hepatic vascular origin. Resection is the preferable treatment option in patients with resectable disease. However, liver transplantation has become the treatment of choice for patients with non-resectable multifocal and bi-lobar lesions. The long-term outcome of this malignancy is not fully known and there is a need for long-term follow-up studies to determine the actual recurrence rate of this disease.

1. Introduction

Hepatic hemangioendothelioma (HHE) is a very uncommon mild-moderate malignant tumor arising from hepatic vascular endothelium. The first case report was published in 1982 by Weiss et al. HHE has a very low incidence, with <1 per 10, 00000 population worldwide [1]. Till now, almost 200 cases of HHE have been published in the literature [2]. The disease prevalence in females to males is 3:2 [1].

The etiology of the disease is yet not fully understood however few possible risk factors for the development of HHE such as vinyl-chloride, contraceptive use, and trauma have been reported [3,4].The clinical manifestations of this malignancy vary from asymptomatic and non-specific symptoms to hepatic insufficiency [1].

Imaging modalities like contrast-enhanced computed tomography and magnetic resonance imaging(MRI) scans show various radiographic features but for a definitive diagnosis, the histological analysis and various immunohistochemistry stainings are done on needle biopsy [2].

Here, we report a case of this rare tumor presented to our department who underwent living donor liver transplantation for non-resectable disease. This work has been reported in line with the SCARE 2020 criteria [4].

2. Case presentation

A 19-year old unmarried female presented with intermittent moderate dull right hypochondrium pain for 9 months. She was a non-smoker and non-alcoholic. On examination, she was having a normal physique and built. Abdominal examination showed mild tender hepatomegaly. System examination showed no abnormality. Routine hematology and biochemical laboratory parameters, including LFTs were within the normal reference range. Serology for hepatitis B and C was negative. Tumor marker alpha-fetoprotein was also normal.

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On abdominal sonography, two hypoechoic lesions were found in both lobes of the liver. CT scan abdomen showed enlarged and irregular liver with mild hypertrophy of caudate lobe of the liver and two hypodense lesions in both right and left lobe of the liver. The largest lesion was localized in segment VI, VII and VIII of the liver measuring 100 × 80 mm while the other hypodense lesion of 30 × 25 mm size was in the segment III and IV of the liver (Fig. 1). Diagnosis of HHE was made on sonographic guided fine needle aspiration cytology of the voluminous right lobe lesion with positive CD31, ERG, and raised proliferative index of Ki 67on immunohistochemistry.

This case was discussed in a multidisciplinary meeting and liver transplantation(LT) was advised for non-resectable multifocal bi-lobar hepatic lesions.

The patient underwent successful living donor liver transplantation. The donor was the brother of the patient. Right lobe graft weighting 694 g with right hepatic vein, right hepatic artery, right portal vein, and the right hepatic duct was implanted. After implantation, intraoperative Doppler ultrasound showed patent hepatic vasculature. The patient was shifted to ICU and was kept on mechanical ventilation till the next morning and was extubated after confirmatory Doppler ultrasound for hepatic vessels patency. Initially, on 1st post-operative patient was started on Immunosuppressant oral Tacrolimus 0.5 mg BID, and oral steroids i.e. prednisolone 20 mg OD. Tacrolimus dose was adjusted according to blood levels. The patient stayed for 5 days in ICU and 6 days in the ward. She was discharged on the 10th post-operative day in a stable condition. Steroid therapy was tapered till 3 months and tacrolimus was continued as maintenance therapy.

Liver specimen histopathology showed that the lesion area was composed of elongated and stellate cells with branching processes. These also showed cytoplasmic vacuolation. Epithelioid cells were also seen forming nests and tufts of capillary vascular spaces. Background stroma was hyalinized, myxoid, and pale. The rest of liver parenchyma was atrophic and reactive biliary proliferation was noted. Immunohistochemically staining was positive CD31, CD34 in the vascular component of the tumor. Hep-par1, cytokeratin, and CK-7 revealed the residual parenchymal elements. All these features were favoring HHE.

At 08 months follow up, she is fine and doing well and all the lab reports were in the normal range. Follow up CT scan study showed no recurrence.

3. Clinical discussion

The etiology and risk factors for this tumor are not known, although the disease occurs frequently in middle-aged females with vague symptoms [5]. Diagnosing HHE is quite difficult due to nonspecific radiological features. Ultrasonography often shows discrete multiple hypoechoic nodules. Computed tomography (CT) scan shows a hypodense space-occupying lesion in the liver or multiple discrete nodules with target appearance. While MRI scans demonstrate low signal intensity lesions on T1W images and high signal intensity heterogeneous lesions on T2W sequences [6,7]. These radiological features often resemble metastatic lesions, and the same was experienced in this case.

Tissue diagnosis remains the mainstay for diagnosing this rare tumor in the absence of classic radiologic findings. Currently, there is a growing trend of performing fine-needle aspiration cytology (FNAC) for nearby accessible hepatic lesions for diagnosing HHE [8–10]. In our case, the pre-operative diagnosis was made with ultrasound-guided core biopsy assisted by immunohistochemistry. The other differentials with HHE are cholangiocarcinoma, hepatocellular carcinoma metastatic carcinoma, angiosarcoma, and malignant melanoma [10].

In our case, the histopathologic appearance was composed of elongated and stellate epithelioid cells with branching processes forming nests with background hyalinized and myxoid stroma. The endothelial nature of these malignant cells may be established by the typical immunohistochemical detection of CD31and CD34 [8]. In our case, immunohistochemical staining was also positive for CD34 and CD 31 confirming the diagnosis of HHE.

Fig. 2a and b tumor infiltrates and replaces normal liver parenchyma stop the neoplastic cells are variably dendritic with elongated processes and also epithelioid in appearance. There is variable nuclear atypia. Cytoplasmic vacuoles are identified. Background stroma is hyalinized,

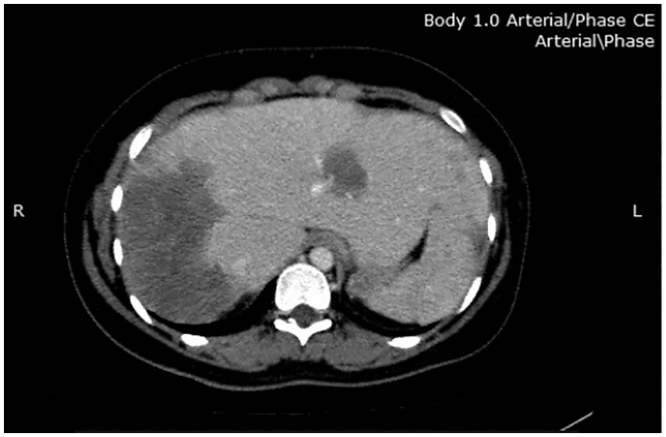
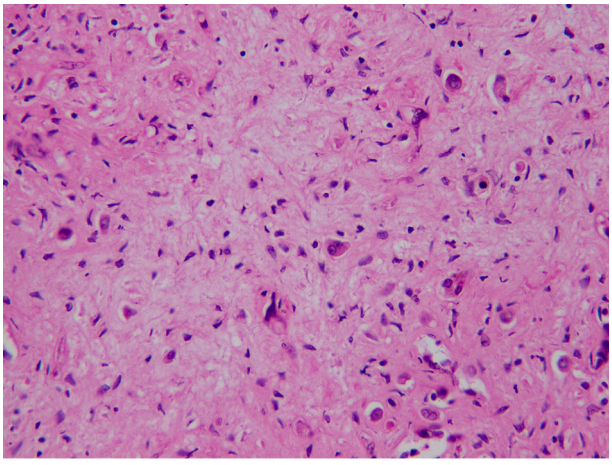
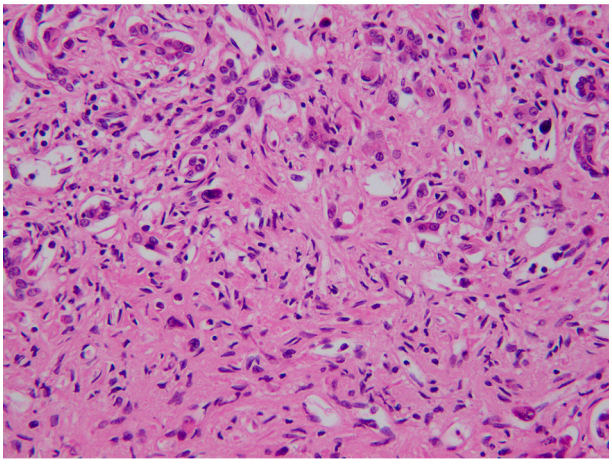


Fig. 1. CT scan liver showing two hypodense lesions in the arterial phase.



a) Low power



b) Medium power

Fig. 2. a Low power
b Medium power.

myxoid, and pale in appearance.

Multiple treatment options are available for treating this tumor presented at various stages including LT, surgical resection, chemotherapy, transcatheter arterial embolization, percutaneous ethanol ablation, immunotherapy, and watchful waiting for silent tumor. Surgical resection should be the primary curative treatment option; however, in the majority of the patients, oncologic resection is not possible due to multifocality or the difficult anatomic location of the lesions [1]. The common most treatment option in practice is LT and is indicated for patients having a multifocal and bi-lobar irresectable disease [5]. living-donor LT may be advocated as a precise solution in highly selected cases, such as those who have bi-lobar lesions without extrahepatic spread, because it addresses the problem of organ shortage and preserves the donor pool [1]. In the present case, Living donor LT was performed as the disease burden was high. Based upon the expression of vascular endothelial growth factor (VEGF), targeted therapy such as bevacizumab(anti-VEGF agents) monotherapy, or combination with other cytostatic agents such as capecitabine can be used as adjuvant therapy [11].

The prognosis of this tumor varies widely, from slow-growing lesions to rapidly progressive disease [12]. LT appears to be a good surgical treatment for patients, with an overall 5-year survival of 80% [5].

4. Conclusion

HHE is a very rare mild-moderate malignant tumor of hepatic vascular origin. Resection is the preferable treatment option in patients with resectable disease. However, liver transplantation has become the treatment of choice for patients with non-resectable multifocal tumors and bi-lobar lesions. The long-term outcome of this malignancy is not fully known and there is a need for long-term follow-up studies to determine the actual recurrence rate of this disease.

Patient perspective

I was having pain in my tummy on the right side for the last 9 months. I visited many doctors during this time and ultimately landed in the liver transplant unit, where after thorough investigations, the team offered me a liver transplant due to the nature of my illness. Everything went well and I was taken care of. Now, I am feeling much better and I thank them for their care.

Ethical approval

Pir Abdul Qadir Shah Jeelani Institute of Medical SCIENCES, Gambat, Sindh, Ethical Committee.

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Guarantor

Kaleem Ullah.

Registration of research studies

N/A.

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Provenance and peer review

Not commissioned, externally peer-reviewed.

CRediT authorship contribution statement

1. Kaleem Ullah: Study conception and design
2. Abdul Wahab Dogar: Performed the procedure, critical revision and overall supervision
3. Shams Uddin: Acquisition of data
4. Zaka Ullah Jan: Drafting of manuscript
5. Syed Hasnain Abbas: Review of discussion
6. Azam Shoaib: Participated in data collection

Declaration of competing interest

None declared.

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