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Case report

Clinicopathological analysis of concomitant hepatic embryonal rhabdomyosarcoma and hepatocellular carcinoma

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ABSTRACT

Hepatic embryonal rhabdomyosarcoma (ERMS) is extremely rare. Here we report the simultaneous occurrence of hepatocellular carcinoma (HCC) and ERMS of the liver in a 40-year-old man without any symptoms. Macroscopically, the mass was composed of two different tumors. The large tumor was 4.5 × 4 × 4 cm and was poorly circumscribed and soft in the central region of left lateral lobe of the liver with apparently focal necrosis. The small tumor, with diameter of 1 cm, was adjacent to the large tumor without clear boundary. Histologically, the large tumor was composed of numerous spindle-shaped or round cells with brightly eosinophilic cytoplasm as well as pathologic mitosis. Immunohistochemical staining was positive for MyoD1 and myogenin in nuclear testing. However, in the small tumor, cells demonstrated hepatocyte differentiation and were focally positive for HepPar1. A diagnosis of concomitant ERMS and HCC of the liver was made. The patient received no adjuvant treatment after hepatic left lateral lobectomy. The regular follow-up observation conducted by imaging examinations displayed that there was no sign of recurrence or metastasis of the mass over 32 months. To our knowledge, this is the first case report of ERMS of the liver associated with HCC. The diagnosis can only be made by pathological examination. The primary therapy method for this tumor is operative resection.

1. Introduction

Rhabdomyosarcomas (RMSs) comprise the single largest category of soft-tissue sarcomas in children and adolescents, accounting for nearly 5–10% of all solid tumors in childhood. However, they are very rare in adults [1,2]. RMSs have been divided into four tissue types: embryonal, alveolar, pleomorphic, and spindle cell/sclerosing [1]. They may occur in any organ, but it is rare for them to be found in the liver. To the best of our knowledge, only 14 cases of RMS of the liver have been described [3,4]. Specifically, only three cases of hepatic embryonal rhabdomyosarcoma (ERMS) in an adult have been reported since 1979 (Table 1). Hepatocellular carcinoma (HCC) is the most common histological type of primary liver cancer. In China, the most important HCC-associated risk factors are chronic infection with hepatitis B virus or hepatitis C virus, especially the former one [5]. The coexistence of these two separated malignant tumors in the same hepatic tissue has not been described, and their potential mutual effects are presently not clear.

Herein, we report a unique case of hepatic ERMS combined with HCC in a middle-aged man. The main objective of the report is to investigate clinicopathological features, clinical manifestation, and prognosis of concomitant ERMS of the liver and HCC in the same hepatic tissue.

2. Materials and methods

A 40-year-old man presented with a history of hepatitis B virus infection for 9 years. His physician found a space-occupying lesion in the patient's liver by routine physical examination. As a result, the patient was sent to our hospital for comprehensive examination and treatment. He had no relevant family history. The patient underwent an abdominal ultrasonography scan, which showed a mass measuring nearly 5.6 × 4.8 cm in the liver with an obscure boundary and uneven internal echo. Subsequently, the upper abdominal contrast-enhanced computed tomography and magnetic resonance imaging demonstrated that the mass was

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Table 1
Summary of hepatic embryonal rhabdomyosarcoma in adult cases described since 1979.

NO.	Author (year)	Age	Sex	Location	Size(cm)	Metastases	Treatment	Follow-up (months)
1	Mc Ardle (1989)	53	M	Right lobe	20 × 20	None	None	DOD(3)
2	McRae (2005)	19	F	Right lobe	20 × 15	Right kidney	CT	DOD(NA)
3	Naeem Haider (2013)	17	M	Left lobe	20 × 13	Paravertebral Lymph node	CT	DOD(31)
4	Arora A (2016)	67	M	Left lobe	14 × 12	None	Surgery + CT	NED(24)
5	Present case	40	M	Left lobe	4.5 × 4	None but Combining with HCC	Surgery	NED(32)

M, male; F, female; CT, Chemotherapy; NA, not available; DOD, died of disease; NED, no evidence of disease.

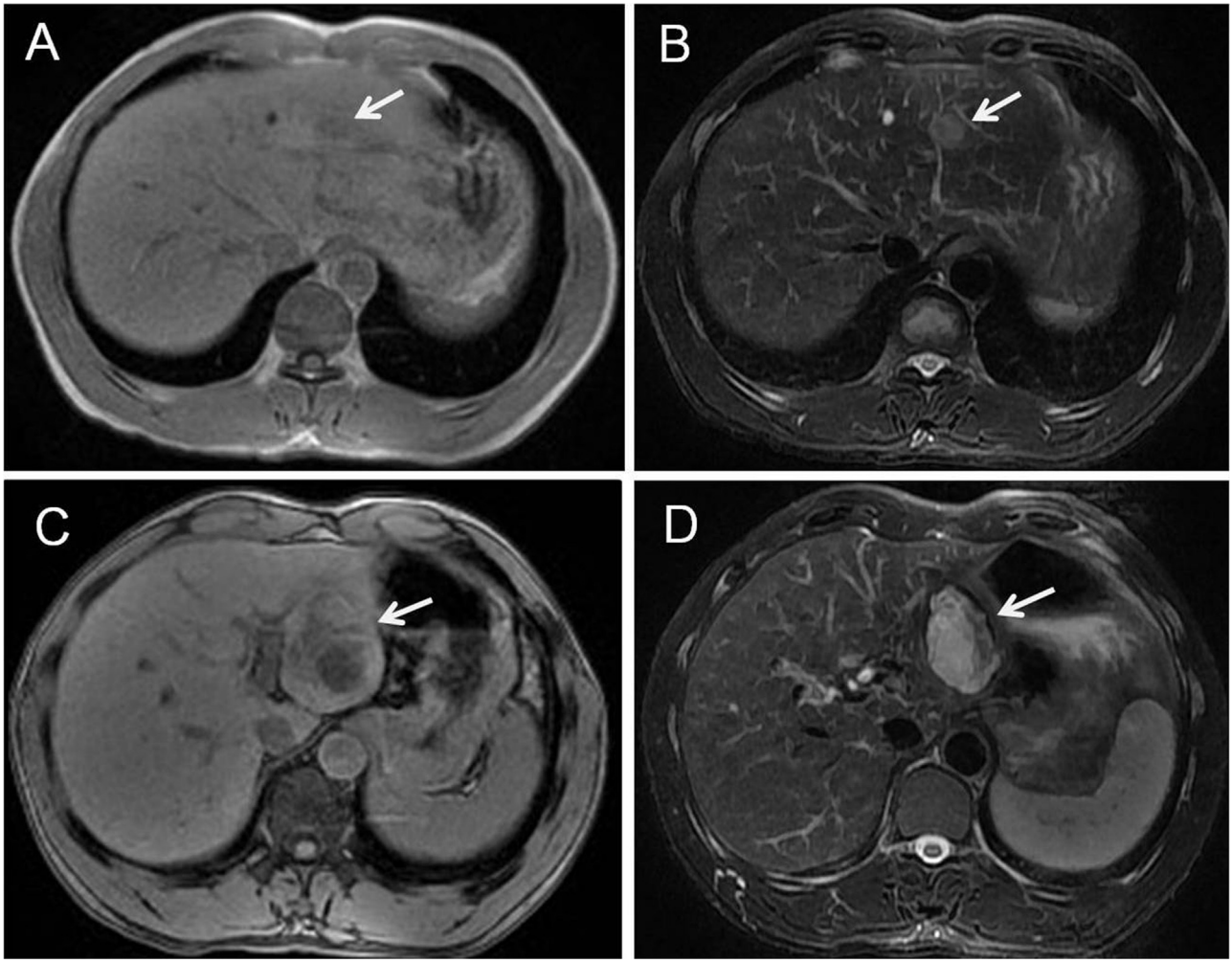

Fig. 1. Magnetic resonance imaging: The small lesion in the fourth segment of the liver demonstrates low signal intensity on T1-weighted images (A) and high signal intensity on T2-weighted fat-suppressed images (B). The large lesion in the left lobe of the liver demonstrates low signal intensity on T1-weighted images (C) and largely high signal intensity on T2-weighted fat-suppressed images (D).

nearly 4.9 × 3.5 cm and located in the left lateral lobe of the liver accompanied by a small nodule in the fourth segment of the liver (Fig. 1).

The laboratory results, including routine blood examination, blood glucose, and liver function, were within the normal range. The serum concentration of alpha-feto-protein (AFP) was 22 ng/mL. The HBVsAg, HBVeAg, and HBVcAb were positive, and the HBV-DNA was less than 200 IU/mL without normal treatment. The chest contrast-enhanced computed tomography and the whole body bone scan had no additional abnormal findings. A hepatic left lateral lobectomy was successfully completed. After surgery, the patient was discharged from the hospital and had an uneventful recovery under postoperative treatment of approximately 1 month.

Resected specimens were routinely fixed in 10% neutral buffered formalin after surgery. The tissues were embedded in paraffin. Sections 4 mm in thickness were stained with hematoxylin and eosin.

Immunohistochemical analyses were performed using the Ventana UltraView Universal DAB Detection Kit, and primary antibodies were obtained from different companies specifically. Primary antibodies included vimentin, myogenin, MyoD1, desmin, Actin, Ki-67, S100, SMA, CD68, CD34, ALK, HepPar1, Glypican3 and PCEA. Specimen sections were dewaxed and rehydrated and then were treated with cell conditioning solution (Ph 8.5) at 100 °C for antigen retrieval. After sufficient incubation with diluted primary antibodies with appropriate concentration, slides were added with the Ventana UltraView Universal DAB Detection Kit for 30 min at 37 °C, followed by diaminobenzidine (DAB) for 8 min.