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Case Report

Hepatocellular Adenoma Mimicking Hepatocellular Carcinoma in a 15-Year-Old Girl: A Diagnostic and Imaging Challenge

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Abstract

Hepatocellular adenoma (HCA) is a rare benign liver tumor, typically affecting young women with hormonal risk factors. Its occurrence in adolescents without such predispositions is unusual and diagnostically challenging, as HCA can mimic hepatocellular carcinoma (HCC) radiologically. We report a 15-year-old girl presenting with right hypochondrial pain and radiological features highly suggestive of HCC, yet histopathology confirmed HCA. This case highlights the diagnostic dilemma of HCA mimicking malignancy, emphasizing the role of biopsy and multidisciplinary evaluation to avoid unnecessary oncologic interventions in young, low-risk patients.

Keywords: Adenoma; Liver Cell; Carcinoma; Hepatocellular; Liver Neoplasms; Adolescent; Liver Biopsy; Diagnostic Challenge

Introduction

Background: Hepatocellular adenoma (HCA) is a rare benign liver tumor typically affecting young women with hormonal risk factors [1,2]. Its presence in adolescents without such factors is uncommon HCA often mimics hepatocellular carcinoma (HCC) on imaging, making diagnosis challenging [3]. Here, we present to you a case of a 15-year-old girl presenting with a two-year history of intermittent right hypochondrial pain and on evaluation was found to have radiological findings suggestive of HCC with histology suggestive of HCA. This case underscores the diagnostic complexity of HCA in adolescents, especially when imaging mimics HCC. Histopathological confirmation and multidisciplinary input are crucial for appropriate management.

Case Report

A 15-year-old girl from Punjab, Pakistan, presented to the outpatient Department with intermittent right hypochondrial pain for two years. The pain, initially mild, had worsened over time. She reported no weight loss, jaundice, vomiting, or systemic symptoms. There was no history of oral contraceptive use, and no family history of liver disease or malignancy. She denied smoking, alcohol, or drug use. Serologic testing for hepatitis B and C was negative. On examination, she appeared pale and there were no signs of chronic liver disease. Cardiovascular system (CVS), central nervous system (CNS), and respiratory (chest) examinations were unremarkable. The abdomen was soft, non-tender, and non-distended. Her vitals

were BP 100/90 mmHg, pulse 78 bpm, RR 20 bpm. Lab reports showed Hb 10.3 g/dl, TLC 9.6, Platelets 306, TBR 0.45mg/dl, SGPT 31, SGOT 29 ALP 103 U/L, GGT 13 U/L. Meanwhile, her tumor markers showed normal serum alpha feto-protein levels (AFP) of 0.75 ng/ml (normal limit: less than 8.5ng/ml), while PIVKA-II was significantly elevated (333.9 mAU/mL). An abdominal ultrasound was planned and revealed multiple hypo dense lesions in the liver. Thereafter, a CT abdomen with contrast revealed multiple arterially enhancing lesions involving both hepatic lobes, demonstrating portal venous and delayed phase washout (Figures 1 A and B).

The largest lesion measured 3.6 × 4.6 × 3.8 cm and caused mild compression of the inferior vena cava without evidence of invasion. No biliary dilatation, ascites, or lymphadenopathy was seen. Therefore, a liver biopsy was performed, yielding two core samples. Histological examination revealed mildly thickened trabecular, focal loss of the reticulum network, fatty change, and unpaired arteries. No cellular atypical, necrosis, or mitotic figures were observed. These findings were consistent with hepatocellular adenoma (Figure 2). Diagnosis was confirmed by an expert pathologist. No treatment was initiated. As per the multidisciplinary tumor board's

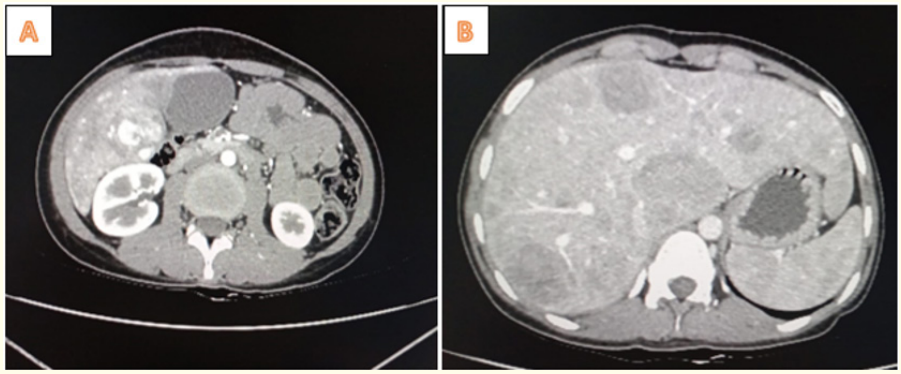

Figure 1: A and B: CT abdomen showing multiple Hypodense areas in both lobes of liver with arterial enhancement and venous washout suggestive of HCC.

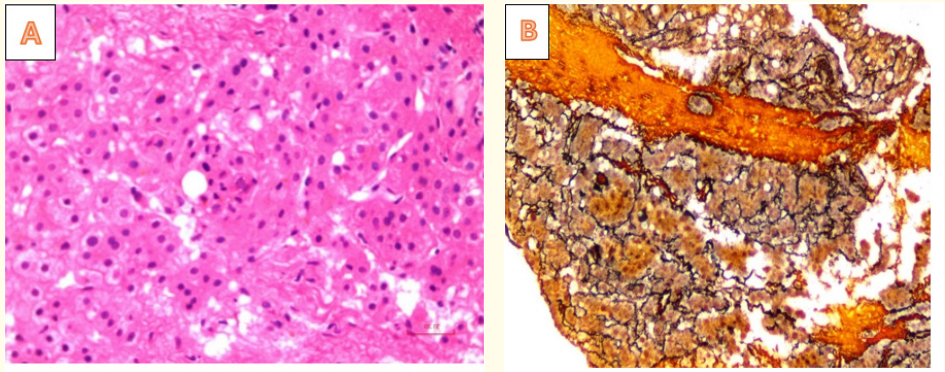

Figure 2: A and B: Mildly thickened trabecular, focal loss of the reticulum network, fatty change, and unpaired arteries. No cellular atypical, necrosis, or mitotic figures were observed. These findings were consistent with hepatocellular adenoma.

recommendation, a repeat CT scan is planned after three months. If the disease progresses, the patient will be managed on the lines of hepatocellular carcinoma (HCC). If stable, the case will be re-discussed for further management.

Discussion

Our patient was a 15-year-old girl with no known risk factors, and the lesions were multifocal, arterially enhancing, and demonstrated delayed washout, all classic radiological signs of hepatocellular carcinoma (HCC) [4]. Despite these aggressive features, her biopsy confirmed benign HCA. This makes the case particularly noteworthy: it reflects not just an atypical patient demographic, but also an atypical radiological behavior of a lesion that is, in most contexts, benign. Additionally, while malignant transformation of HCA into HCC occurs in fewer than 10% of cases, it is almost always associated with specific molecular subtypes and predisposing factors, none of which were present in this case [5]. Similar cases have been described in the literature. Yacoub., *et al*. (2017) reported a lesion with typical HCC imaging that turned out to be an inflammatory HCA with β-catenin activation [6]. Zhu., *et al*. (2024) discussed a hepatic PEComa mimicking HCC [7], and Kondo., *et al*. (2023) described an HCA that resembled focal nodular hyperplasia [8]. These reports reinforce the value of histological confirmation in atypical presentations. Ultimately, the decision to biopsy in this case prevented unnecessary treatment. Instead of surgical or oncologic intervention, the patient was placed under surveillance, with plans for a repeat CT scan after three months. This outcome reflects the importance of multidisciplinary collaboration and cautious clinical decision-making. This case demonstrates that not all lesions with imaging features of HCC are malignant. Particularly in young, non-cirrhotic patients with normal tumor markers, histological confirmation is essential before initiating treatment. The radiological mimicry of HCC by HCA, though rare, is a critical diagnostic pitfall that clinicians must recognize to avoid overtreatment.

Conclusion

This case illustrates how hepatocellular adenoma can closely mimic hepatocellular carcinoma on imaging even presenting with multiple lesions and enhancement patterns that are virtually indistinguishable from malignancy. Only through biopsy was the correct, benign diagnosis achieved. This case should prompt clinicians to critically evaluate radiologic findings in light of clinical and pathological data, especially in young patients with no risk factors. It reinforces that histopathology remains the gold standard in liver lesion diagnosis and that cautious, multidisciplinary evaluation

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