Assessing Benign Liver Lesions in Hepatitis B Patients: A Focus on Von Meyenburg Complexes

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Consent
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Human And Animal Rights
This study was conducted in compliance with ethical standards and did not involve any experiments on animals.

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ABSTRACT

Background: Von Meyenburg Complexes (VMCs), also known as biliary hamartomas, are rare, benign malformations of the intrahepatic bile ducts that can pose diagnostic challenges due to their resemblance to metastatic liver lesions, especially in patients with chronic hepatitis B virus (HBV) infection. Although generally asymptomatic, VMCs require careful imaging-based differentiation from malignant liver lesions, particularly in HBV patients at risk for hepatocellular carcinoma (HCC).

Case Presentation: We report the case of a 33-year-old male with chronic hepatitis B, normal liver function tests, and a viral load of 1.94 x 10^3 copies/mL. Screening ultrasound revealed a few subcentimeter liver cysts, prompting further evaluation. Non-contrast CT showed multiple hypoechoic structures scattered throughout the liver lobes, too small to characterize precisely. Magnetic resonance imaging (MRI) confirmed the presence of VMCs, displaying hypointensity on T1-weighted images and hyperintensity on T2-weighted images without enhancement, differentiating these lesions from malignancies. Three-dimensional MR cholangiography with maximum intensity projection showed additional, minute lesions with no involvement of the biliary tree, suggesting diffuse VMCs. Tumor markers were negative, further ruling out metastatic disease.

Discussion: This case emphasizes the importance of accurate imaging and diagnostic differentiation in patients with coexisting HBV and VMCs. VMCs have distinct MRI features that facilitate differentiation from malignant liver lesions, reducing the need for invasive biopsy. Given the patient's hepatitis B status, a structured follow-up strategy was implemented, including routine ultrasound, elastography, and periodic liver function tests to monitor liver status without antiviral treatment.

Conclusion: The coexistence of VMCs and hepatitis B poses unique diagnostic challenges. Accurate imaging and a tailored follow-up approach are essential to ensure appropriate management and avoid unnecessary interventions. This case highlights the critical role of advanced MRI techniques in confirming benign lesions and guiding patient care in chronic liver disease contexts.

CASE REPORT

INTRODUCTION

Von Meyenburg Complexes (VMCs), also known as biliary hamartomas, are rare benign malformations originating from ductal plate malformations in the intrahepatic bile ducts. These lesions are generally small, cystic dilatations embedded in fibrous stroma and are often asymptomatic, discovered incidentally during imaging studies such as MRI, CT scanner, or ultrasound [1,2]. With a reported prevalence between 0.35% to 5.6%, VMCs are typically found as multiple, small cystic lesions scattered within the liver, often misdiagnosed as metastatic disease due to their appearance [3,4].

The VMCs pathology comprises irregularly shaped bile ducts in fibrous stroma, sometimes containing inspissated bile. They appear hypointense on T1-weighted MRI and hyperintense on T2-weighted MRI, aiding differentiation from other hepatic conditions [5]. While usually benign, cases of malignant transformation to cholangiocarcinoma have been reported, highlighting the importance of monitoring and differential diagnosis, especially in patients with underlying liver conditions like hepatitis [2,4].

This report discusses a rare case of VMCs in a patient with chronic hepatitis B, examining its imaging characteristics and emphasizing the importance of distinguishing VMCs from other liver lesions to avoid unnecessary interventions.

CLINICAL CASE

A 33-year-old male with a known history of chronic hepatitis B presented without specific antiviral treatment and maintained normal liver function. His HBV DNA level was quantified at 1.94 x 10^3 copies/mL. Liver stiffness measurement by ultrasound elastography was consistent with fibrosis stage F0-F1, indicating minimal to no fibrosis. Screening abdominal ultrasound revealed a few liver cysts, all measuring less than 5 mm in diameter.

To further evaluate these findings, a non-contrast CT scan was performed, demonstrating multiple hypoechoic structures, each less than 5 mm in size, scattered across various liver lobes. These lesions were too small to characterize precisely (Figure 1). Subsequently, MRI confirmed the diagnosis of VMCs, or biliary hamartomas (Figure 2).

DISCUSSION

In this case, we encountered a patient with chronic hepatitis B who presented with incidentally detected VMCs on imaging. VMCs, also known as biliary hamartomas, are benign lesions that can pose a diagnostic challenge due to their potential to mimic malignant liver conditions, particularly in patients with chronic liver diseases like hepatitis B. This discussion addresses the relevance of VMC in hepatitis B patients, its imaging characteristics, strategies for ruling out malignancy, and an optimal follow-up approach.

Chronic hepatitis B is a well-established risk factor for hepatocellular carcinoma (HCC), and even patients with minimal fibrosis are monitored for cancer due to HBV's oncogenic potential. Although VMCs themselves are benign and typically non-progressive, the co-existence of chronic hepatitis B in this patient underscores the importance of cancer surveillance. Hepatitis B patients require periodic monitoring with imaging and tumor markers like AFP, PIVK-II to detect early malignant changes, regardless of concurrent benign lesions [6,7]. Although no literature has documented the co-occurrence rate of hepatitis B and VMCs, in rare cases, VMCs may undergo malignant transformation to cholangiocarcinoma, further reinforcing the need for vigilance, particularly in patients with chronic viral hepatitis [8]. Additionally, VMCs are often discovered incidentally and can be found in patients with chronic liver diseases, including hepatitis B. The prevalence of VMCs is estimated to be up to 5.6% in autopsy studies, and these lesions consist of small cystic structures embedded in fibrous stroma, typically distributed throughout the liver lobes [4,5]. In hepatitis B patients, the presence of VMCs does not necessarily indicate liver dysfunction, as most VMCs remain asymptomatic and do not significantly impact liver function tests. However, VMCs can occasionally complicate the clinical picture by resembling metastatic lesions on imaging, emphasizing the importance of accurate diagnosis.

The issue when patients have VMCs and hepatitis B is to rule out any malignant liver lesions. VMCs display distinct imaging characteristics that facilitate differentiation from malignant liver lesions. On ultrasound, they appear as multiple small hyperechoic or hypoechoic lesions, sometimes exhibiting comet-tail artifacts due to their fibrotic composition. Magnetic resonance imaging (MRI) is particularly useful, showing VMCs as hypointense on T1-weighted images and hyperintense on T2-weighted images without contrast enhancement, which differentiates them from malignancies [2,4]. MRI is the preferred modality for confirming VMC diagnosis, as it provides clear tissue characterization, thereby minimizing the need for invasive biopsy unless imaging is inconclusive. The resemblance of VMCs to metastases or cholangiocarcinoma on imaging can complicate the diagnostic process, particularly in hepatitis B patients who are at increased risk for liver cancer. To differentiate VMCs from malignant lesions, a combination of imaging techniques, including MRI and MRCP, is valuable. In this case, MRI with hepatobiliary contrast agents helped confirm the benign nature of the lesions by demonstrating the absence of enhancement and communication with the biliary tract. Additionally, cancer markers (e.g., AFP, PIVK-II, CA 19-9, and CEA) were used to rule out malignancy. In cases where these markers are elevated or imaging shows atypical characteristics, a biopsy may be warranted to confirm the benign nature of the lesions [2,4,7].

Due to the benign nature of VMCs and the absence of antiviral therapy in this case, a tailored follow-up approach was adopted. Routine imaging with ultrasound every 3 to 6 months

and periodic liver stiffness measurement by elastography were deemed sufficient to monitor any changes in liver status and detect early fibrosis progression due to hepatitis B [4,9]. If imaging remains stable over time, the interval for follow-up imaging can be gradually extended, minimizing unnecessary interventions. Importantly, patients are educated on the benign nature of VMCs and the rationale for monitoring, which helps reduce anxiety and fosters compliance with the follow-up regimen.

CONCLUSION

The case highlights the diagnostic challenges associated with VMCs in hepatitis B patients, particularly in distinguishing these benign lesions from potential malignancies. Accurate imaging interpretation and a comprehensive follow-up plan, emphasizing regular non-invasive monitoring, are essential to manage such cases effectively without subjecting patients to undue interventions. This approach balances the need for vigilance in hepatitis B patients with a patient-centered strategy that respects the benign nature of VMCs, ultimately improving patient outcomes and quality of life.

TEACHING POINT

Von Meyenburg Complexes (VMCs) can mimic metastatic liver lesions, particularly in patients with chronic liver diseases like hepatitis B. Advanced imaging techniques, such as MRI with hepatobiliary contrast agents, are crucial for accurate differentiation and avoidance of unnecessary invasive interventions.

QUESTIONS

- What are the key imaging features of Von Meyenburg Complexes that help differentiate them from malignant liver lesions?
- How does the coexistence of hepatitis B impact the management and follow-up of patients with incidental VMCs?

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FIGURES

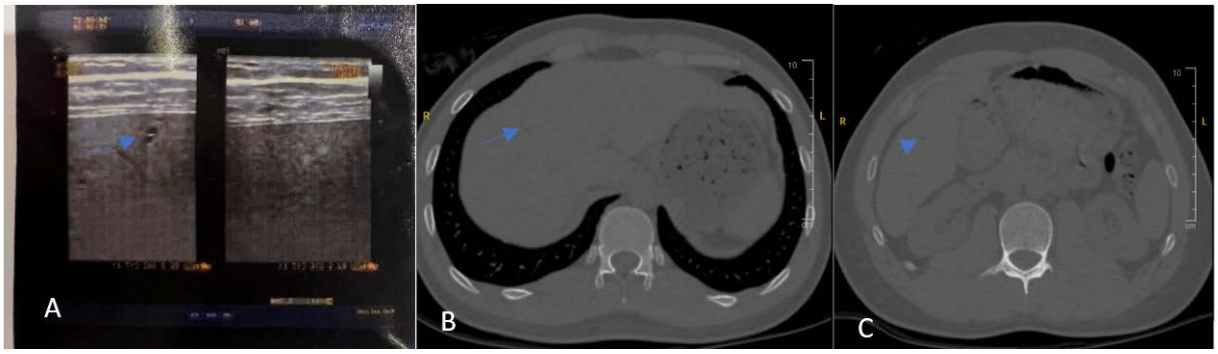

Figure 1: A: Abdominal ultrasound revealed a few liver cysts, all measuring less than 5 mm in diameter (arrows).

B, C: Non-contrast CT scan was performed, demonstrating multiple hypoechoic structures, each less than 5 mm in size, scattered across various liver lobes (arrows).

To rule out malignancy, cancer markers were assessed, and further imaging was performed to exclude the possibility of metastatic disease. After a multidisciplinary discussion, the treating physicians reached a consensus that, given the benign nature of VMCs and the absence of clinical progression, the patient would not require antiviral therapy at this time. Instead, he would be closely monitored with regular laboratory tests and imaging studies.

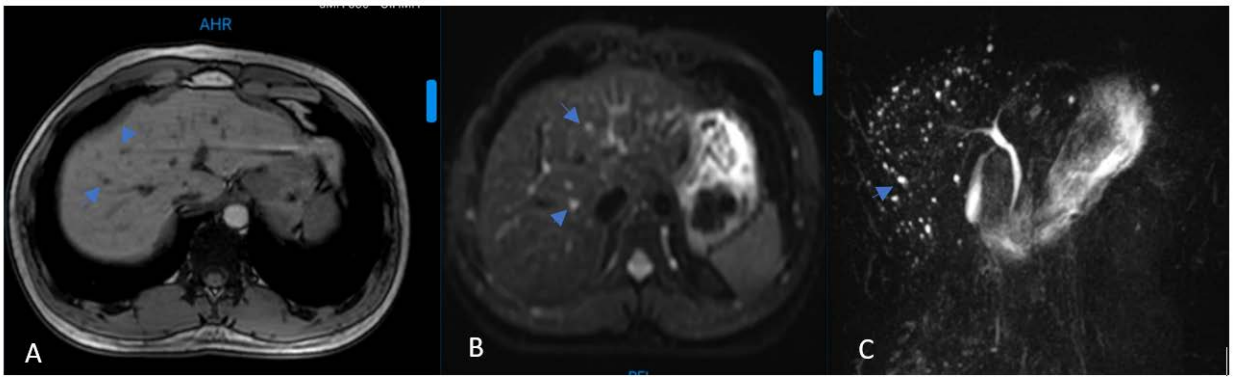

Figure 2: A: T1-weighted image obtained after intravenous administration of a non-liver-specific gadolinium chelate during the interstitial phase shows focal liver lesions with no enhancement (arrows);

B: On a T2-weighted MR image, multiple cystic lesions present with irregular margins (arrows);

C: Three-dimensional MR cholangiography with maximum intensity projection reconstruction reveals additional lesions, all of which are very tiny. The biliary tree has a normal appearance. These MR findings suggest diffuse VMCs (arrows).

The follow-up plan included abdominal ultrasound, laboratory cancer marker screening, liver elastography, and assessments of liver and renal function every three to six months. Throughout these intervals, no changes were observed in imaging or laboratory findings. The patient continued regular follow-up without specific antiviral treatment, undergoing routine tests to monitor his condition.

KEYWORDS

Von Meyenburg Complexes (VMCs), Hepatitis B Virus (HBV), Differential Diagnosis of Liver Lesions

ABBREVIATIONS

CT = COMPUTED TOMOGRAPHY
HBV = HEPATITIS B VIRUS
HCC = HEPATOCELLULAR CARCINOMA
MRI = MAGNETIC RESONANCE IMAGING
MRCP = MAGNETIC RESONANCE CHOLANGIO-PANCREATOGRAPHY
VMCs = VON MEYENBURG COMPLEXES

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