International Journal of Science and Research (IJSR)
ISSN: 2319-7064
Impact Factor 2024: 7.101

Understanding: Atypical FNH: Causes, Diagnosis, and Challenges

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Abstract: ***Focal nodular hyperplasia (FNH) is a benign lesion occurring in a background of normal liver. FNH is seen most commonly in young women and can often be accurately diagnosed at imaging, including CT, MRI, or contrast - enhanced US. In the normal liver, FNH frequently must be differentiated from hepatocellular adenoma, which although benign, is managed differently because of the risks of hemorrhage and malignant transformation. When lesions that are histologically identical to FNH occur in a background of abnormal liver, they are termed FNH - like lesions. These lesions can be a source of diagnostic confusion and must be differentiated from malignancies. Radiologists' familiarity with the imaging appearance of FNH - like lesions and knowledge of the conditions that predispose a patient to their formation are critical to minimizing the risks of unnecessary intervention for these lesions, which are rarely symptomatic and carry no risk for malignant transformation.***

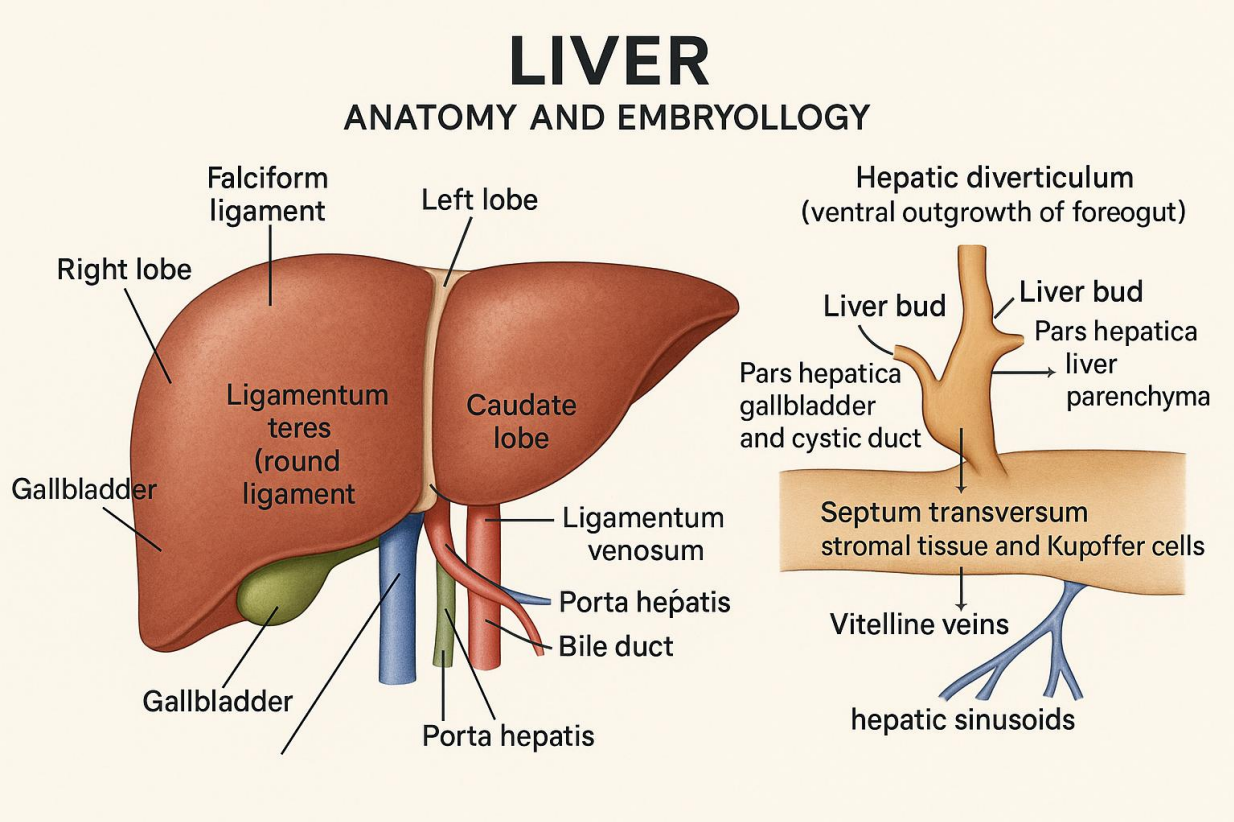
Keywords: Liver, Benign tumor, Adenoma, Focal nodular hyperplasia

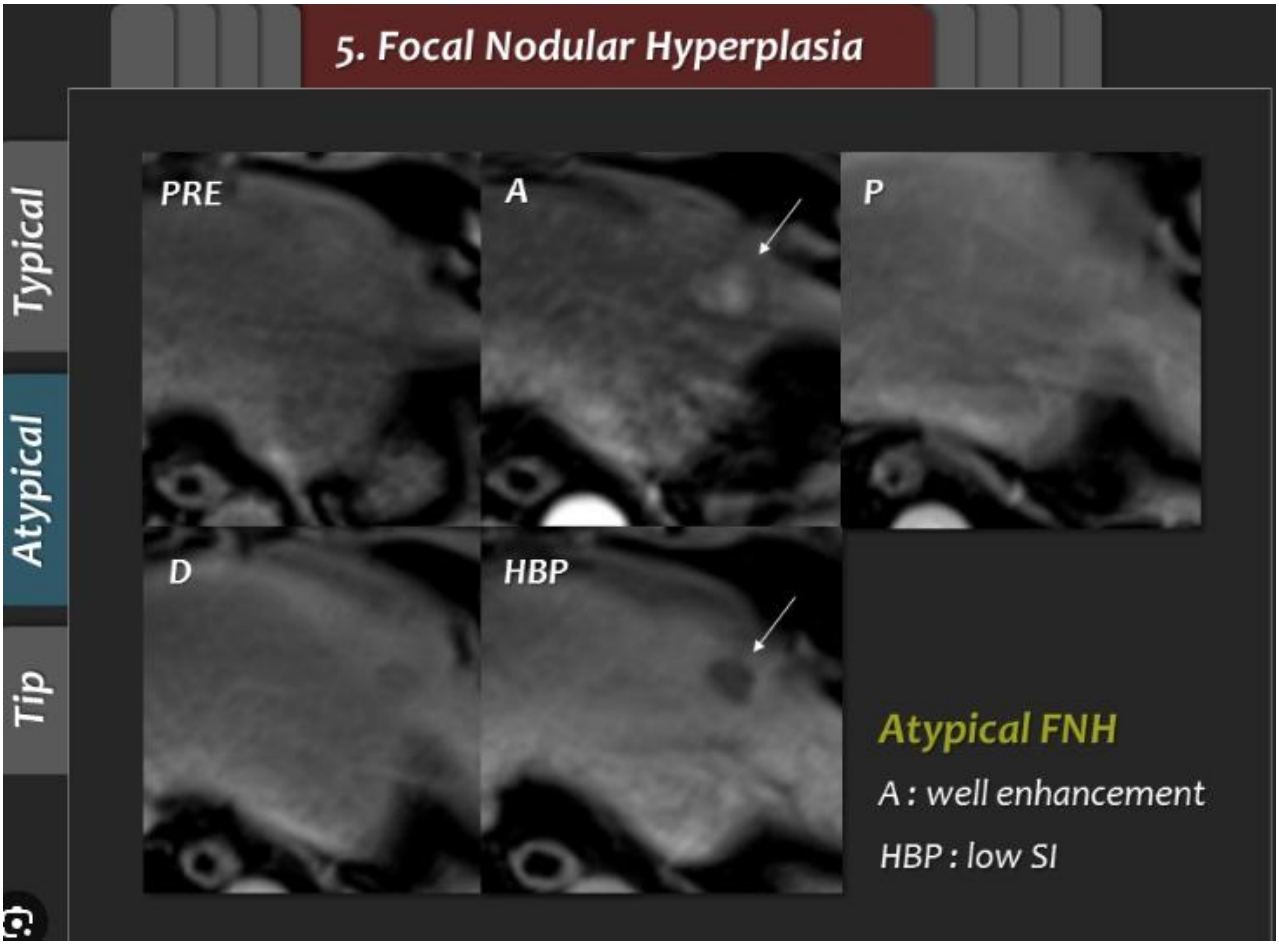
1. Introduction

Focal nodular hyperplasia (FNH) is the second most common benign lesion of the liver after hemangioma. Because FNH has no malignant potential or life - threatening complications such as hepatocellular adenoma, further intervention or surgical resection is not needed when the diagnosis is confirmed. The characteristic radiologic findings of FNH have been well documented, but the exact distinction of FNH from other hypervascular hepatic tumors is not easy, especially in cases of small lesions. Gadoxetic acid (Gd - EOB - DTPA, Primovist®, Bayer Schering Pharma AG, Berlin, Germany) is a hepatocyte - specific magnetic resonance (MR) contrast agent that is increasingly used for liver MR imaging. Gadoxetic acid is actively taken up by hepatocytes and excreted along the bile duct and kidney. It is known to be specific for the diagnosis of FNH, showing hyperintense or isointense regions compared to the liver during the delayed hepatobiliary phase (3, 4). Several atypical imaging findings have been reported for FNH (5), but most are CT - based imaging findings, and there are only a few reports concerning atypical findings in hepatocyte - specific MR contrast - enhanced imaging.

Liver: Anatomy and Embryology

Anatomy:





2. Case Report

A 44 year - old female was admitted to our emergency department due to progressively worsening abdominal pain. The pain was initiated in the epigastrium and accompanied with vomiting and diarrhea of several days' duration.

MRI Abdomen (Plain + Contrast) was performed.

MRI Abdomen (Plain + Contrast):

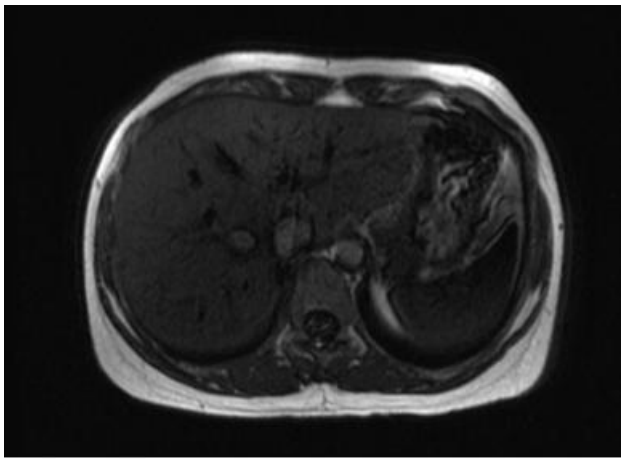


Figure 1: T2W

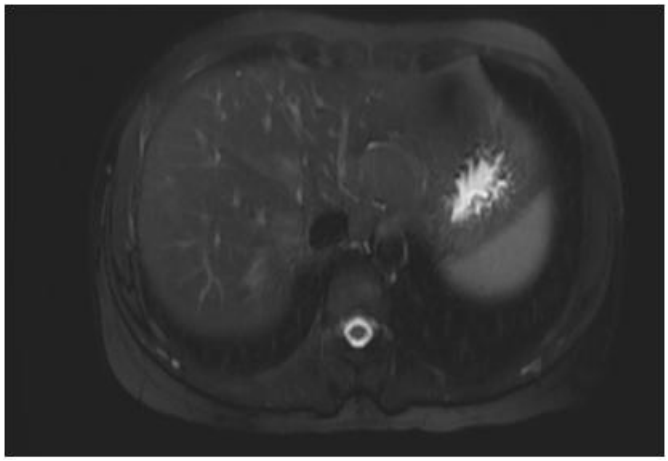


Figure 2: T1W

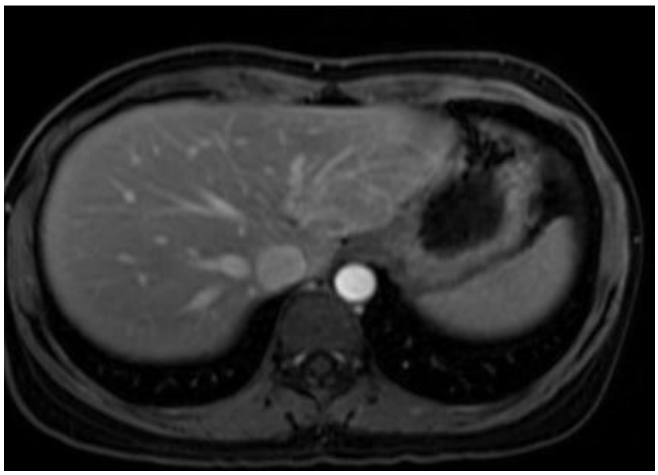


Figure 3: Post Contrast

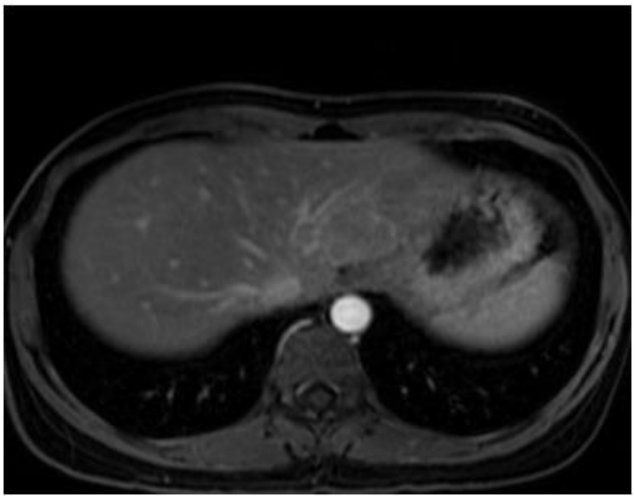


Figure 4: Post Contrast

3. Report

Liver parenchyma shows a well - defined area of altered signal intensity measuring approximately 2.7 x 4.2 x 3.0 cm (AP x TR x CC) noted in the segment II of the left lobe of the liver closely abutting the left hepatic vein with no obvious involvement. They appear isointense - hyperintense on T2W and isointense on T1W with mild peripheral enhancement on post contrast study. Findings are most likely suggestive of benign etiology, well differentiated HCC or metastasis from unknown primary cannot be completely ruled out.

4. Treatment

The management of emphysematous pancreatitis includes conservative therapy, such as administering fluids, electrolytes, and antimicrobial therapy to control septic shock. Depending on the response to conservative measures and clinical condition of the patient, surgical debridement or percutaneous drainage may also be feasible.

5. Conclusion

Atypical presentations of focal nodular hyperplasia, as demonstrated in this case, pose significant diagnostic challenges due to their resemblance to malignant hepatic lesions. Radiologic evaluation using MRI, especially with hepatocyte - specific contrast agents, remains central to accurate diagnosis. Awareness of such atypical imaging patterns is crucial for radiologists to avoid misdiagnosis and prevent unnecessary interventions. Ultimately, integrating imaging findings with clinical context and, when needed, histological confirmation ensures appropriate management of these benign liver lesions.

6. Discussion

Focal nodular hyperplasia (FNH) is a benign liver lesion that is often incidentally discovered and rarely requires treatment. The typical presentation involves young to middle - aged women, and classic imaging findings include a central scar with characteristic enhancement patterns on MRI, particularly with hepatocyte - specific contrast agents such

as gadoxetic acid. However, atypical presentations, like the one in this case, can complicate the diagnostic process.

In this case, the lesion demonstrated atypical imaging features, including mild peripheral enhancement without a well - defined central scar. Such presentations may overlap with other hepatic lesions, including well - differentiated hepatocellular carcinoma (HCC) or metastatic deposits, especially in patients with risk factors or atypical demographics. Therefore, careful correlation of imaging features, clinical history, and, if necessary, histopathologic analysis becomes essential.

The presence of isointense - to - hyperintense signals on T2 - weighted imaging and isointense signals on T1 - weighted imaging with mild peripheral enhancement raised concern for possible malignancy. However, the stability of the lesion, lack of aggressive features, and patient demographics ultimately supported a benign etiology. The challenge lies in distinguishing such FNH - like lesions from malignant ones, especially when imaging features deviate from the classic pattern.

This case underscores the diagnostic dilemma posed by atypical FNH and highlights the critical role of advanced MRI techniques, including the use of hepatocyte - specific contrast agents, in differentiating benign from malignant liver lesions. It also emphasizes the importance of clinical judgment in avoiding unnecessary invasive interventions in patients with benign hepatic lesions.

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