

Understanding Gamna-Gandy Bodies and its Imaging Aspects: A Case Report

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Abstract

Gamna-Gandy bodies, also recognized as splenic siderotic nodules, are pathological formations within the spleen. These nodules result from hemorrhagic and necrotic processes in the spleen's red pulp, often consequent to increased blood pressure, particularly observed in cases of portal hypertension [1]. Yet, to date, literature on the MRI detection of splenic Gamna-Gandy bodies is sparse and not widely familiar.

This case report details the diagnostic imaging findings and clinical implications of Gamna-Gandy bodies in a 16-year-old patient with recurrent bacterial cholangitis, that has progressed to hepatic cirrhosis, evaluated for potential complications, including Caroli's disease.

Keywords: Gamna Gandy Bodies; Spleen; Pediatric Imaging; Case Report

Introduction

The Gamna-Gandy bodies (GGB), named after Carlo Gamna (1866 -1950) and Charles Gandy (1872 - 1943), represent siderotic nodules stemming from small intrasplenic hemorrhagic foci [2]. They are commonly accepted as being primarily related to the phenomenon of portal hypertension [3]. MRI is considered the most sensitive imaging technique for the detection these nodules, mainly because of their iron content, hence understanding the signal characteristics and appearance of these lesions is critical for diagnosis. Yet, to date, there are only a few articles that address the MRI detection of splenic Gamna-Gandy bodies [1,4].

In this case, we present a 16-year-old female patient who had a history of recurrent bacterial cholangitis, which progressed to liver cirrhosis. Unexpectedly, MRI imaging performed to assess potential complications revealed the presence of Gamna-Gandy bodies. This case report adds up to the limited literature reviews on the radiological aspects of splenic GGB in the pediatric population.

Case Report

A 16-year-old patient, previously diagnosed with recurrent bacterial cholangitis that led to hepatic cirrhosis, was evaluated for potential complications, including Caroli's disease. Diagnostic imaging techniques used included ultrasound and magnetic resonance imaging (MRI) to assess the extent of the complications.

Diagnostic imaging findings

The MRI revealed a dysmorphic liver with heterogeneous signal indicative of liver cirrhosis. Portal hypertension signs including a splenomegaly.

Both T1- and T2-weighted images exhibited multiple hypointense, small siderotic nodules within the spleen, each measuring only a few millimeters in diameter (Figure 1).

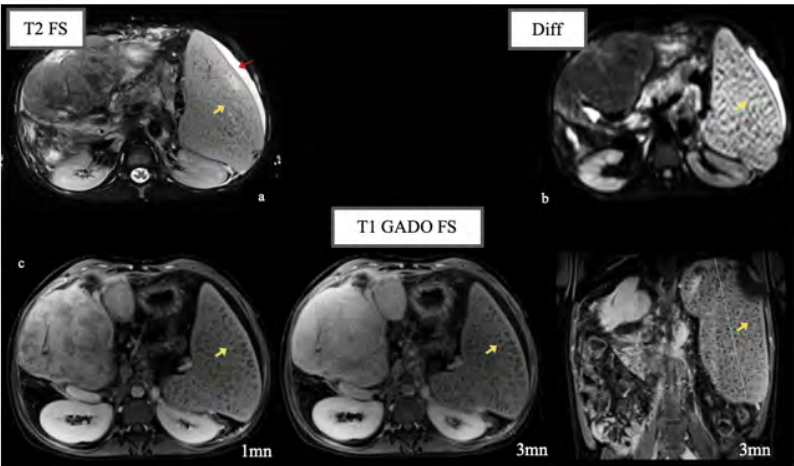


Figure 1: MR imaging showing small hypointense nodules (Gamna-Gandy bodies) within the spleen on T2 FAT SAT (a), DWI (b) and T1 FAT SAT with Gadolinium injected (c) sequences.

a: Marked hypointensity of the liver parenchyma (green arrow) is suggestive of hepatic iron overload. Splenomegaly and ascites (red arrow). Gamna-Gandy bodies (GGB) appearing as a marked hypointensity nodules within the spleen (yellow arrow).

b: Diffusion-weighted sequence: the GGB remain markedly hypointense.

c: T1-weighted sequence with fat suppressed at 1 and 3 minutes post-gadolinium injection. The GGB remain markedly hypointense. Note the distinct blooming effect due to the metallic content of the GGB (blue arrow). There is no late changes in the signal of GGB (yellow arrow).

A complementary abdominal ultrasound demonstrated splenomegaly associated with multiple hyperechoic spots disseminated within the splenic parenchyma, (red arrow) (Figure 2).



Figure 2: Abdominal ultrasound showing the presence of multiple hyperechoic diffuse nodular spots (red arrows) within a large spleen (its diameter = 20 cm).

Discussion

Gamna-Gandy bodies, also recognized as splenic siderotic nodules, are aggregates of hemosiderin, calcium, and fibrous tissue. These nodules form due to hemorrhagic and necrotic processes within the spleen's red pulp, a consequence of increased blood pressure frequently seen in cases of portal hypertension [2].

The pathophysiological process is explained by the rupture of congested splenic sinuses, leading to microhemorrhages and subsequent reactive fibrosis [5]. Although predominantly associated with portal hypertension, Gamna-Gandy bodies may also arise in other circumstances, including portal vein or splenic vein thrombosis, hemolytic anemia, leukemia [6], lymphoma, acquired hemochromatosis, paroxysmal nocturnal hemoglobinuria, and in individuals receiving blood transfusions [7,8]. In cirrhotic patients, the appearance of these nodules signifies increased portal pressure, highlighting the severity of the underlying hepatic pathology [9].

Several concurrent radiological signs of portal hypertension can also be detected and should alert the radiologist. Among these, splenomegaly is common and may indicate increased splenic activity [5,10]. Portal cavernoma, resulting from venous obstruction, as well as greater portal/splenic vein diameter, are indicators of potential hepatic complications or splenic congestion [4,11].

Imaging plays an important role in achieving a positive diagnosis. Its modalities include:

- MRI, which is the Gold Standard for diagnosis: It is the most sensitive imaging modality for detecting Gamna-Gandy bodies, that appear as small, well-circumscribed foci of signal void across all MRI sequences due to hemosiderin presence. The pronounced signal loss on both T1 and T2-weighted sequences results from the high magnetic susceptibility effect of the iron, with the gradient echo (GRE) sequence being particularly sensitive to hemosiderin detection. Lack of enhancement post-contrast administration is crucial for differentiating these nodules from other vascular or neoplastic spleen lesions [12].
- CT scan: May occasionally detect high-attenuation foci within the nodules with adequate calcium content, however, distinguishing them from splenic granulomas remains challenging, therefore limiting the CT scans' diagnosis value [9].
- Ultrasound remains the initial diagnostic tool: It is always the first line method to explore the abdomen. Gamna-Gandy bodies appear as multiple punctiform hyper-echogenic lesions within the spleen [3]. These lesions aren't associated with a posterior acoustic shadowing, setting them apart from calcic deposits [13]. Despite these suggestive findings, ultrasound results are non-specific and require an MRI to confirm diagnosis [14].

The treatment for Gamna-Gandy bodies is primarily focused on managing the underlying conditions that lead to their formation. In cases of portal hypertension, measures to decrease hepatic venous pressure can indirectly affect the development of these nodules.

Prognosis largely depends on the success of managing the associated diseases, and in the absence of significant underlying pathology, the bodies themselves do not require direct intervention.

Conclusion

The identification of Gamna-Gandy bodies is a critical marker of elevated portal pressure, diagnosis should be considered in patients with portal hypertension symptoms, however differential diagnosis should not be neglected.

MRI offers superior diagnostic accuracy compared to other imaging modalities in demonstrating Gamna-Gandy bodies.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

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