

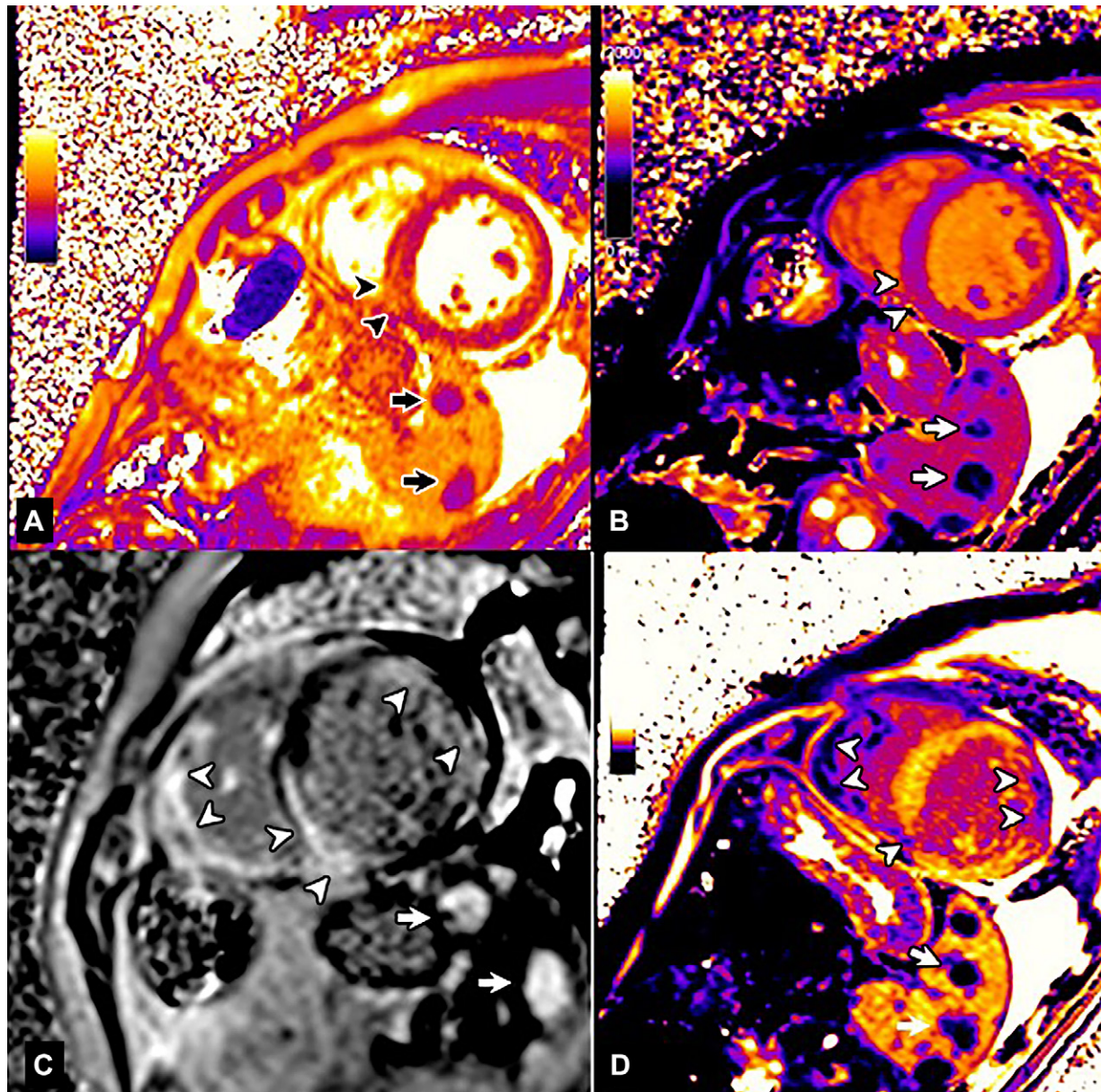
## MRI of Splenic Sarcoidosis with T1 and T2 Mapping

Giovanni Camastra, MD • Federica Ciolina, MD

From the Departments of Cardiology (G.C.) and Radiology (F.C.), MG Vannini Hospital, Via di Acqua Bullicante 4, 00172 Rome, Italy. Received September 4, 2023; revision requested September 24; revision received October 12; accepted October 24. Address correspondence to G.C. (email: [gcamastra@virgilio.it](mailto:gcamastra@virgilio.it)).

Conflicts of interest are listed at the end of this article.

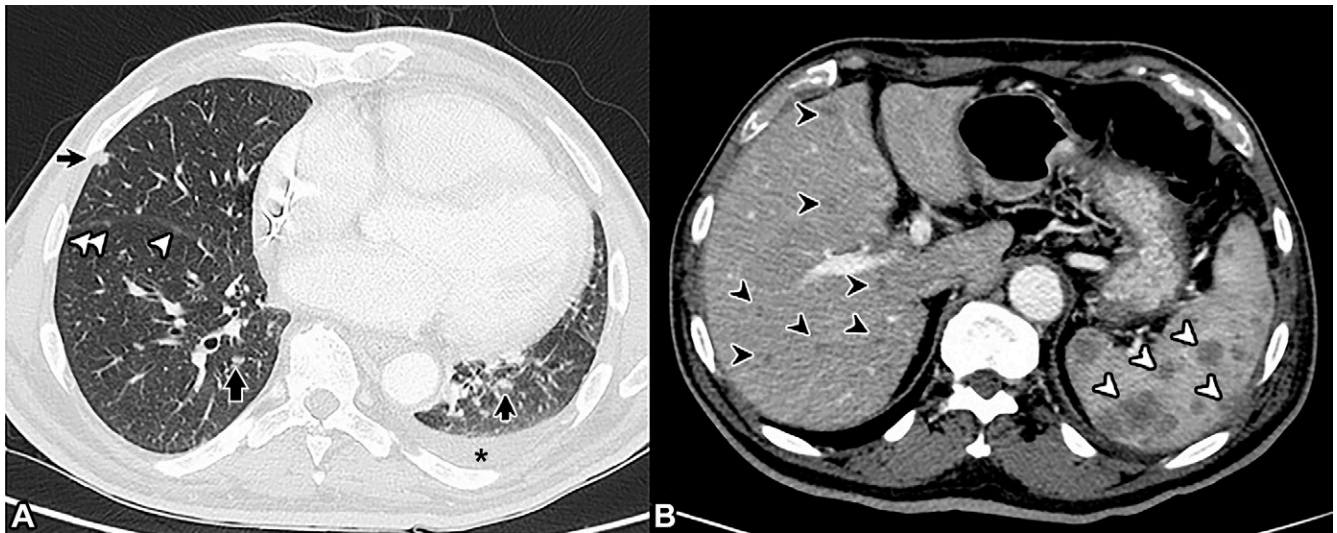
Radiology 2024; 310(2):e232367 • <https://doi.org/10.1148/radiol.232367> • © RSNA, 2024



**Figure 1:** A 75-year-old man presented with heart failure, reduced left ventricular ejection fraction, and second-degree atrioventricular block at MRI. **(A)** Short-axis T2 map shows hyperintensity in the left inferoseptal myocardial wall (arrowheads) and hypointense nodules in the spleen (arrows) compared with healthy parenchyma. **(B)** T1 map at the same location shows there is blurred hyperintensity of the right ventricular septal insertion (arrowheads) and hypointense nodules in the spleen (arrows). **(C)** Postgadolinium delayed contrast-enhanced phase-sensitive inversion-recovery image shows multiple areas of late gadolinium enhancement in the right and left ventricles (arrowheads) and enhancing splenic nodules (arrows). **(D)** Color-coded T1 map after contrast media administration shows hypointensity at the same level of myocardial and splenic lesions (arrowheads and arrows, respectively).

**A** 75-year-old man presented with heart failure, reduced left ventricular ejection fraction, and second-degree atrioventricular block. Coronary angiography demonstrated normal coronary arteries. Cardiac MRI with T1 and T2 mapping sequences (Fig 1) showed high signal intensity on the T2 map of myocardium. Also, there were

multiple round areas in the spleen, with reduced signal intensity compared with healthy tissue (T1, 721 msec vs 1180 msec; T2, 40 msec vs 82 msec, respectively). Postgadolinium delayed contrast-enhanced phase-sensitive inversion-recovery images showed several areas of late gadolinium enhancement in the left and right ventricles and



**Figure 2:** (A) Axial CT scan of the thorax shows perilymphatic micronodules (arrowheads), subpleural and interlobular alveolar opacities (arrows), and mild pleural effusion (\*). (B) Axial CT scan after intravenous contrast media administration shows multiple hepatic (black arrowheads) and splenic (white arrowheads) nodules.

the splenic nodules. Postcontrast T1 maps confirmed myocardial and splenic lesions. These findings were suspicious for sarcoid granulomata. An implantable cardioverter defibrillator was placed during hospitalization. Follow-up chest and abdominal CT showed the presence of tiny nodules in the liver and lungs (Fig 2). US-guided biopsy of the liver nodules and subsequent histopathologic assessment confirmed a diagnosis of sarcoidosis.

The annual incidence of sarcoidosis varies between 1 and 15 individuals per 100 000, depending on the geographic region. Lung involvement and lymph node enlargement are seen in more than 90% of patients, and the eyes, skin, and liver are affected in 15%–30%. Sarcoidosis of the nervous system and heart is less common (2%–10% of patients) and can include conduction disturbances. Advanced imaging uncovers cardiac

involvement 4–5 times more than what is clinically detectable. Liver and spleen sarcoidosis is relatively common but seldom causes symptoms or functional impairment and, for this reason, extracardiac findings need always to be checked for on cardiac MRI scans (1,2).

**Disclosures of conflicts of interest:** G.C. No relevant relationships. F.C. No relevant relationships.

## References

1. Lehtonen J, Uusitalo V, Pöyhönen P, Mäyränpää MI, Kupari M. Cardiac sarcoidosis: phenotypes, diagnosis, treatment, and prognosis. *Eur Heart J* 2023;44(17):1495–1510.
2. Rossides M, Darlington P, Kullberg S, Arkema EV. Sarcoidosis: Epidemiology and clinical insights. *J Intern Med* 2023;293(6):668–680.