

# A Magnetic Surprise: Don't be deterred by the Defib

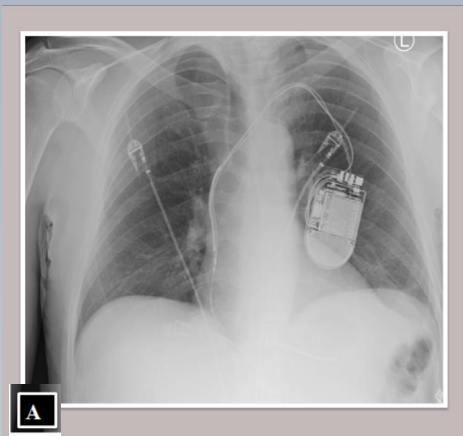
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## Background

Late Gadolinium enhancement on cardiovascular MRI (CMR) is increasingly used for diagnosing the aetiology of LV dysfunction and also for pre-procedural planning for ablation of ventricular tachyarrhythmias (VT) to improve procedural success.

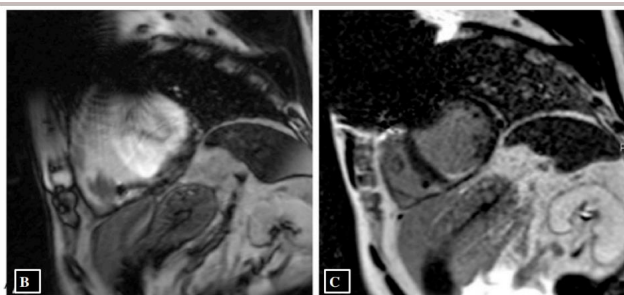
Frequently however patients have implantable cardioverter defibrillators (ICDs) which have historically precluded CMR.



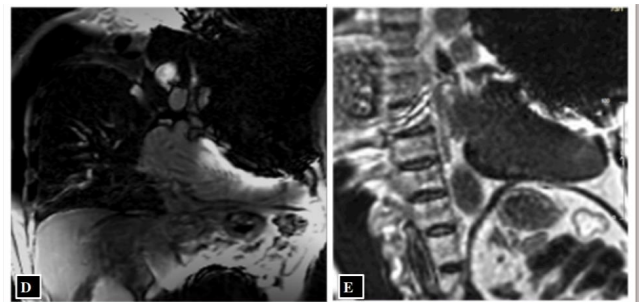
## Clinical Case

A 45 year old male with dilated cardiomyopathy attributed to anthracycline cardiotoxicity from administration for acute lymphoblastic leukaemia 16 years prior presented with a VT storm and multiple appropriate ICD therapies. He had severe left ventricular systolic dysfunction and had undergone implantation of a dual chamber non MRI conditional ICD (Figure A) for primary prevention 6 years prior and was already on maximal beta blockade. He was therefore listed for a VT ablation.

A CMR was arranged for scar localisation for ablation planning. The device was reprogrammed (ODO mode, tachycardia therapies programmed off) and the scan was performed in accordance with ESC and HRS guidelines with written consent obtained. There were no acute complications or significant changes to the lead parameters.



B: Standard FLASH LGE imaging showing significant hyperintensity artifact from the ICD generator. C: Wideband phase sensitive inversion recovery motion corrected sequence removes artefact and demonstrates inferior LGE



D: 2-chamber long axis standard FLASH LGE imaging showing significant hyperintensity artifact. E: Wideband phase sensitive inversion recovery motion corrected sequence improves artefact.

The CMR revealed a dilated and severely impaired left ventricle (LV ejection fraction calculated at 35%) in keeping with a dilated cardiomyopathy. Standard flash late gadolinium enhancement imaging was non diagnostic due to artefact from the ICD generator (Figures B,D).

The hypersensitivity artefact was removed using a wideband phase sensitive inversion recovery motion corrected sequence, revealing transmural late gadolinium enhancement at the basal to mid inferoseptum with extension into the inferior segment- evidence of a previously undiagnosed myocardial infarction (Figures C, E).

A successful endocardial VT ablation was performed with the VT substrate mapped to the basal inferoseptal region.

## Discussion

Our case shows that if protocols are adhered to, a CMR can be safely carried out in patients with non conditional devices. The scan highlighted an additional pathology contributing to the cardiomyopathy which led to effective secondary prevention and critically helped to localise the arrhythmogenic substrate and improve the procedural success.