A 65-year-old male patient with a blank cardiac history was admitted to our hospital after an out-of-hospital cardiac arrest due to ventricular fibrillation. Immediate coronary angiography showed significant three-vessel disease without culprit lesions and no intervention was performed. Cardiac enzymes remained within normal limits and he made a complete recovery. Cardiovascular magnetic resonance (CMR) imaging on day 6 revealed a dilated left ventricle with low ejection fraction (26%). Late gadolinium enhancement accurately delineates reversible and irreversible myocardial injury in animal studies. In humans, scar differentiation by late gadolinium enhancement (LGE) imaging showed subendocardial increased signal intensity (SI), which was 25–50% transmural in the mid-anteroseptal, anterior, and anterolateral segments, and 50–75% transmural in the apical segments (arrows, Panel A). Panel B shows significant three-vessel disease without culprit lesions and no intervention was performed. Panel C). No hyperintensity was observed on T2-weighted imaging and a chronic anterior wall myocardial infarction with substantial residual viable myocardium was concluded. Unfortunately, he died 5 days later prior to a scheduled coronary artery bypass grafting operation. An autopsy was performed.

Macroscopic inspection of a nitro-blue tetrazolium (NBT)-stained, mid-ventricular section of the heart (Panel B) showed scar tissue of an old anteroseptal and anterolateral wall myocardial infarction as a subendocardial rim of compact fibrosis (arrows, Panel B). This represents scar tissue of an infarct of at least several weeks old (transition phase between granulation tissue and old scar tissue). Small discrepancies between histology and LGE CMR are explained by slightly different slice levels, the lower spatial resolution, and partial volume effect of CMR.

Late gadolinium enhancement accurately delineates reversible and irreversible myocardial injury in animal studies. In humans, scar size determined with LGE closely correlates with positron emission tomography and can be used to predict reversible myocardial dysfunction after revascularization. Literature reports comparing LGE CMR with histological confirmed macroscopy in humans are scarce. Our case demonstrates the ability of LGE CMR to detect both dense and diffuse fibrosis.

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