

A discordant myocardial viability finding between low-dose dobutamine stress MRI and late gadolinium enhancement



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- A 65 year old man was referred to our cardio clinic due to abnormal electrocardiogram.
- 3 months earlier, he had a sudden onset of chest pain while cleaning his car.
- The pain persisted for 20 minutes and radiated to the left shoulder. He denied palpitation symptom and the pain spontaneously resolved.
- The patient did not go to the hospital and remained in good physical condition since then.
- He has taken antihypertensive and lipid-lowering medications regularly.
- Physical examination revealed no remarkable findings except a holosystolic murmur 2/6 at apex
- Electrocardiogram showed sinus rhythm with premature atrial complex.
- There was a deep Q-wave in V1-3 and inverted T in V1-5.
- Echocardiogram showed left ventricular function of 45% with akinetic movement of the anterior and antero-septum segments.
- Coronary angiogram revealed >70% stenosis of mid LAD.
- Due to akinetic movement from echocardiography, the patient was sent to cardiac MRI unit for stress and viability assessment.



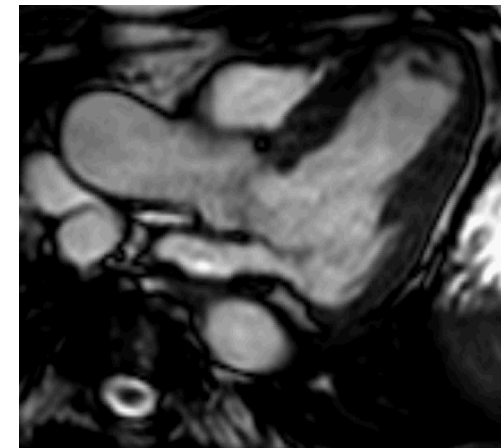
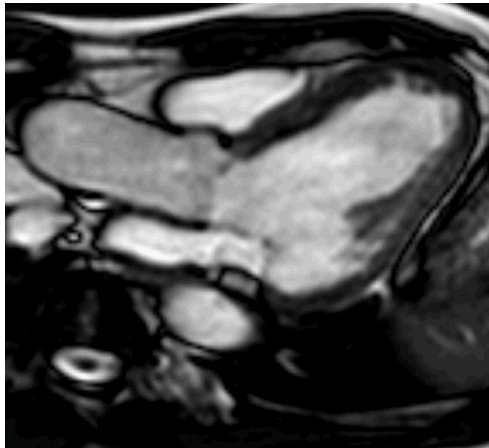
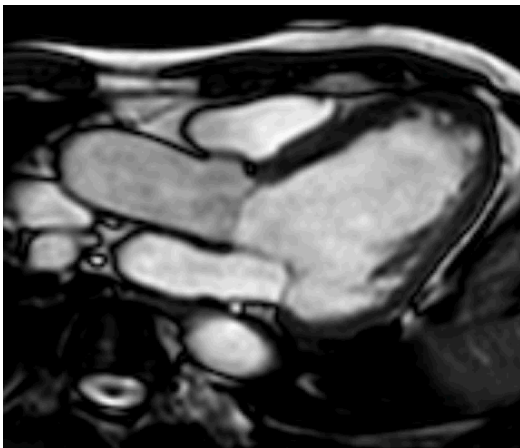
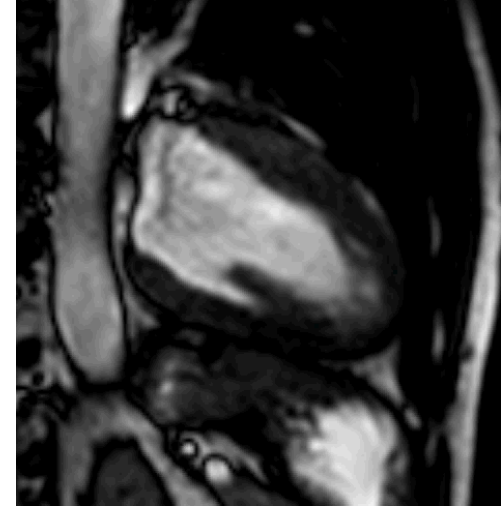
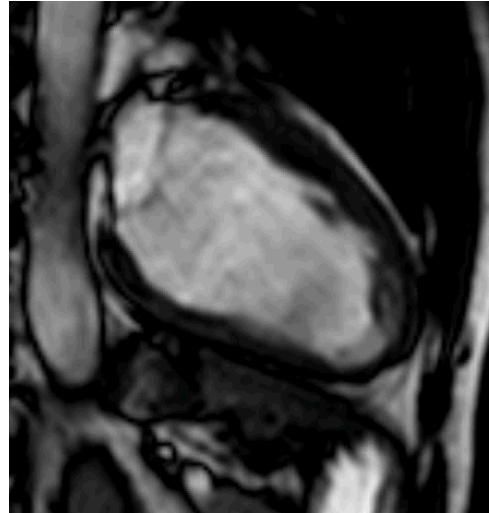
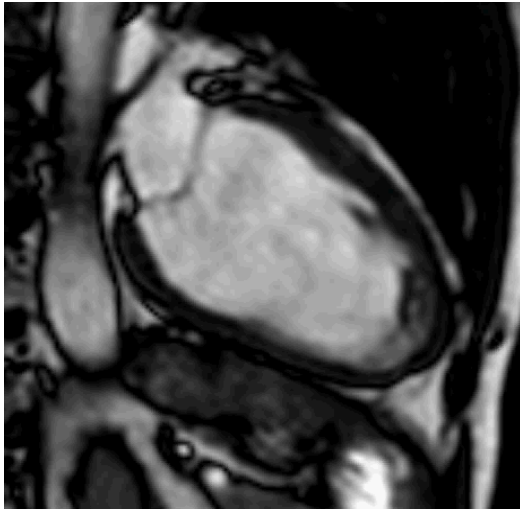
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Rest

10 mcg/kg/minute

40 mcg/kg/minute



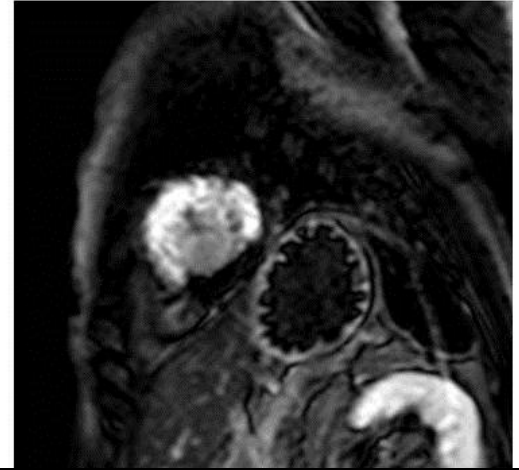
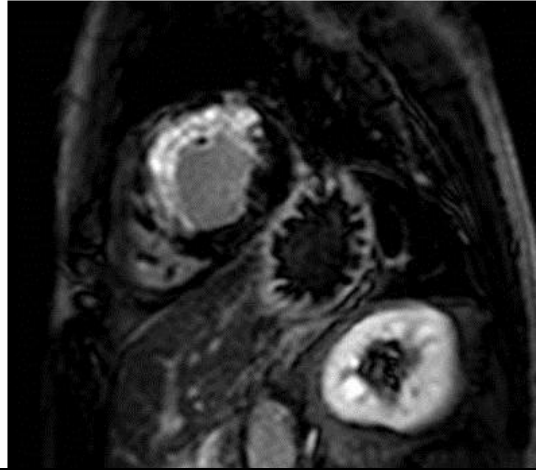
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- Baseline MRI showed mildly dilated left ventricle (LVEDVI 105.38 ml/m²) and mild to moderately impaired left ventricular systolic function (LVEF 48%).
- The apico-anterior and apico-septum demonstrated akinetic movement whereas the mid-anterior and mid-antero-septum revealed severe hypokinesia. Dyskinesia of apex was also found.
- During low-dose dobutamine stress MRI (DSMR), the contractility of the apex, apico-septum and apico-anterior remained unchanged whereas the other myocardial segment showed increased wall thickening.
- High-dose DSMR demonstrated neither new wall motion abnormalities nor biphasic response. The patient did not have any symptoms during stress



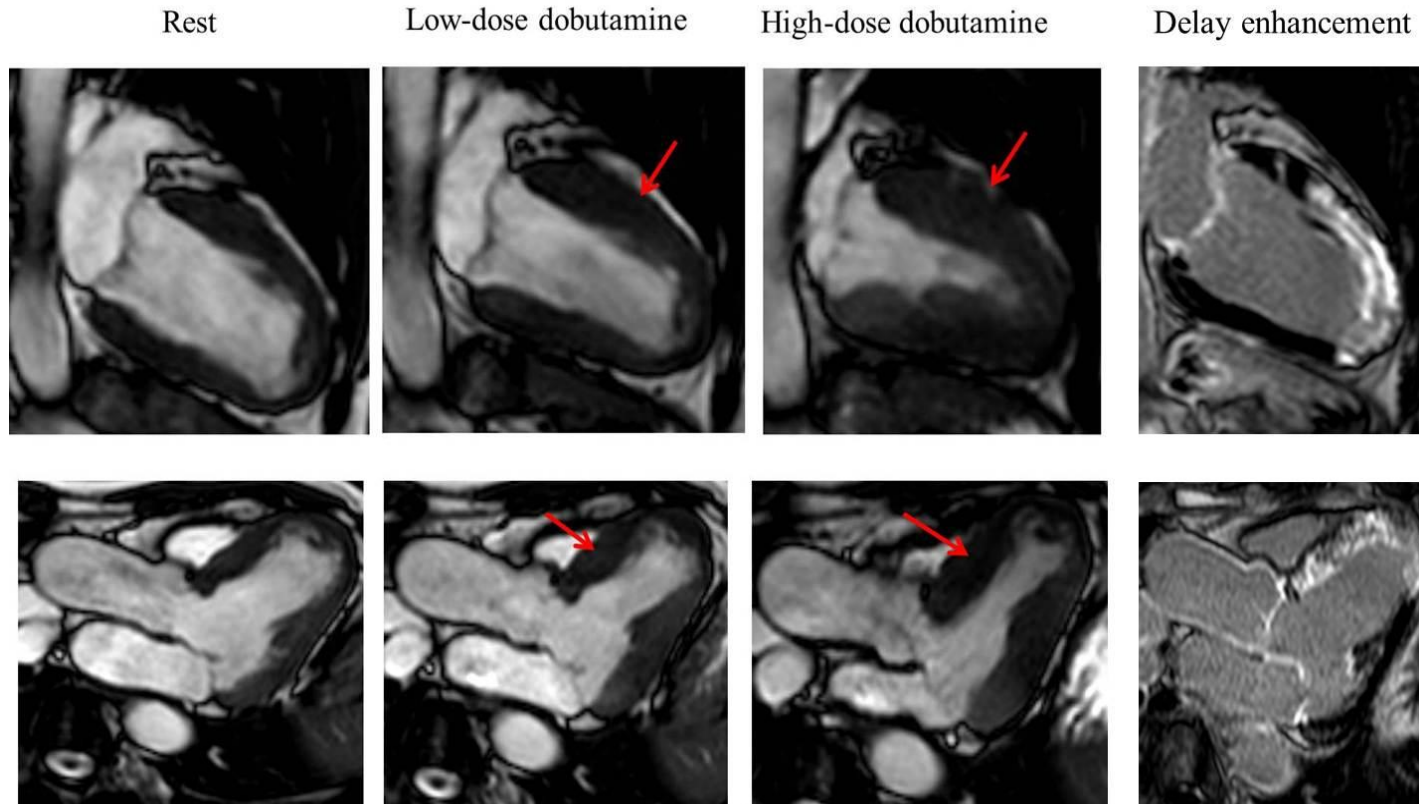
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Delayed enhancement obtained 10 minutes later showed 100% transmural enhancement at apex (segment 17), antero-septum and apico-anterior. There was also >75% transmural heterogeneous enhancement at mid and basal-antero-septum and mid-anterior segments.



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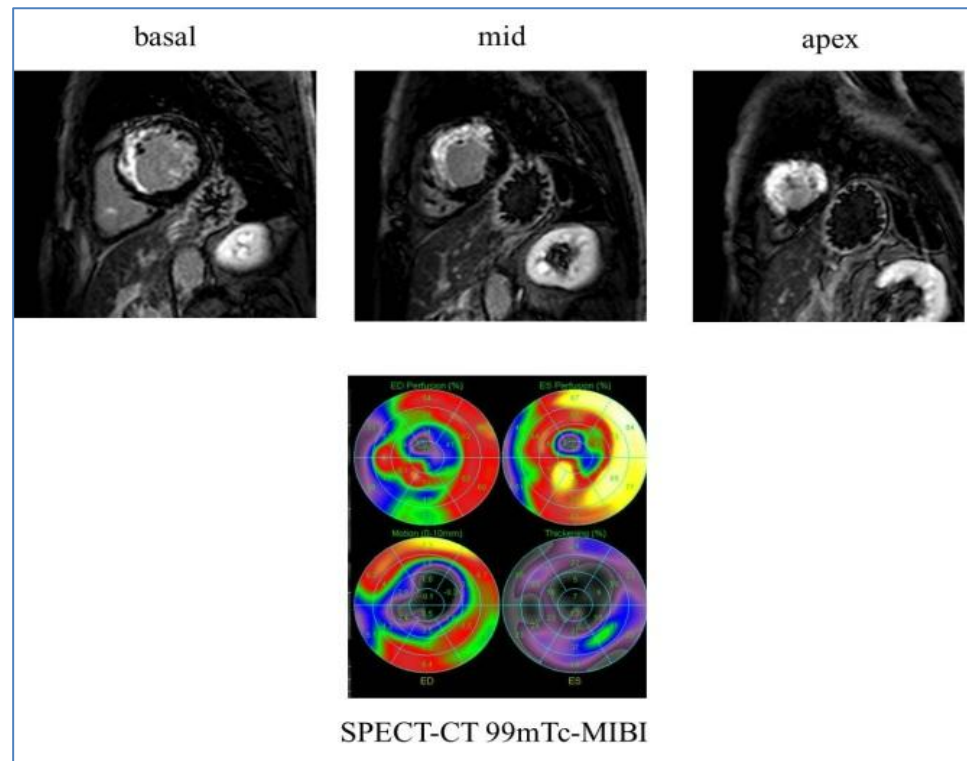


- There are discordant findings between low-dose DSMR and delayed enhancement for myocardial viability assessment in this case.
- Despite of the DSMR findings are suggestive of non-viable myocardium only at apex, apico-septum and apico-anterior, delayed enhancement findings are suggestive of non-viable myocardium beyond those area.

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- Due to discordant results, the patient was sent for nuclear MIBI scan for re-evaluate the myocardial viability.
- ^{99m}Tc -MIBI showed transmural myocardial infarction at apex and apical segment of the anterior wall but the rest of the LV is viable.
- Findings from ^{99m}Tc are more consistent with DSMR than late gadolinium enhancement.



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- The interventionist decided to perform balloon angioplasty at mid LAD.
- Two months later, the patient was rescheduled for MRI to reevaluate the wall motion. The apex and apical segments remained akinesia but mid-anterior and mid-anteroseptum showed improvement of contractility.
- Our patient highlights the superior benefit of the contractile reserve evaluation over the scar imaging for viability evaluation

