



Mechanical Complications of Acute Myocardial Infarction

A recent review in JACC [1] describes the 5 mechanical complications of acute myocardial infarction.

1. Right ventricular infarct
2. Severe mitral regurgitation
3. Ventricular septal rupture
4. Ventricular free wall rupture
5. Left ventricular aneurysm

These complications can also be appreciated on cardiac MRI quite easily.

- 1 Right ventricular infarct or ischemia (Fig. 1) occurs typically with proximal/ostial RCA lesions and usually accompany inferior wall infarcts.
- 2 Severe mitral regurgitation (Fig. 2) is of two types, either due to papillary muscle infarction or acute LV dilatation.
- 3 Ventricular septal rupture (Fig. 3) produces an acute left to right shunt and is potentially fatal.
- 4 Ventricular free wall rupture (Fig. 4) is also potentially fatal, unless contained by the pericardium.
- 5 Left ventricular aneurysm (Fig. 5) is a later complication that occurs due to abnormal dilatation of the infarcted tissue, usually apical.

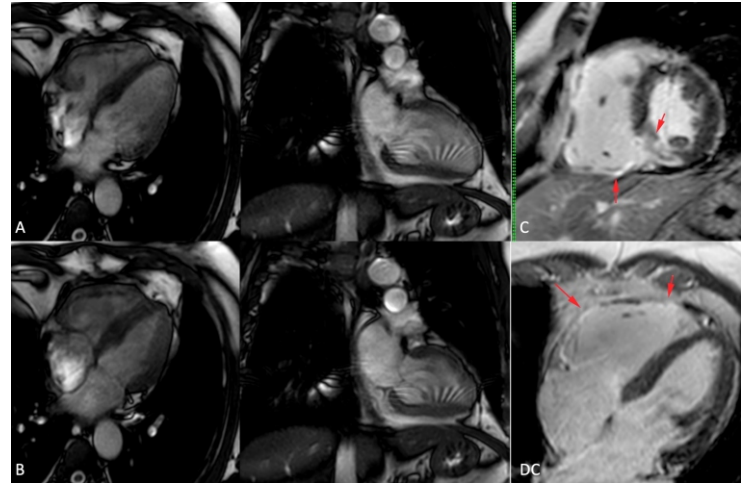


Fig. 1 (A-D). Right ventricular infarct. 69-yr old with acute RCA ostial occlusion. 4C and 2C cine images in diastole (A) and systole (B) show akinesia and dilatation of the RV walls and the inferior LV wall. SA (C) and 4C (D) late Gd images show acute RCA territory infarction involving the inferior LV wall and the RV free wall.

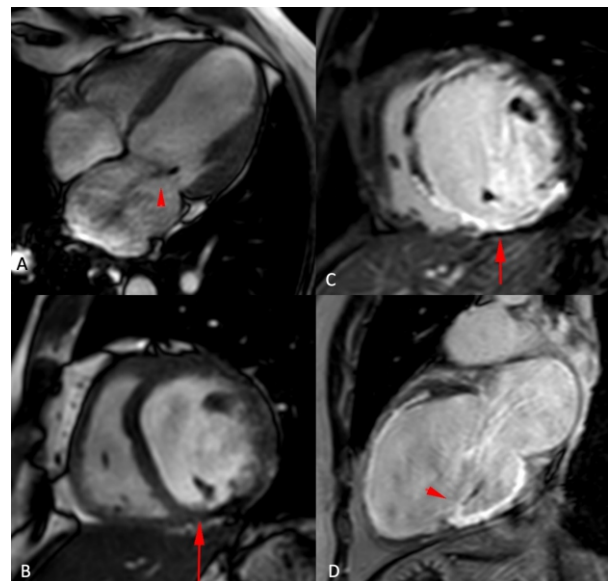


Fig. 2 (A-D): Severe mitral regurgitation. 45-yr old with acute RCA infarct. 4C (A) cine image in systole shows a severe MR jet with LA dilatation while the SA (B) cine image shows thinning of the inferior LV wall. The SA (C) late Gd image shows transmural infarction of the inferior LV wall, which involves the inferomedial papillary muscle (arrow in D) in the 2C view.

At a glance

- ◆ Acute myocardial infarction can cause multiple mechanical complications.
- ◆ These mechanical complications, ranging from acute RV infarct to aneurysm can be diagnosed and detected on cardiac MRI.

Fig. 3 (A,B): Ventricular septal rupture. 62-yrs old with acute LAD infarct. The SA cine (A) shows a rent in the septum (arrow). An acute LAD territory septal infarct is seen in the 4C late Gd image (arrow in B).

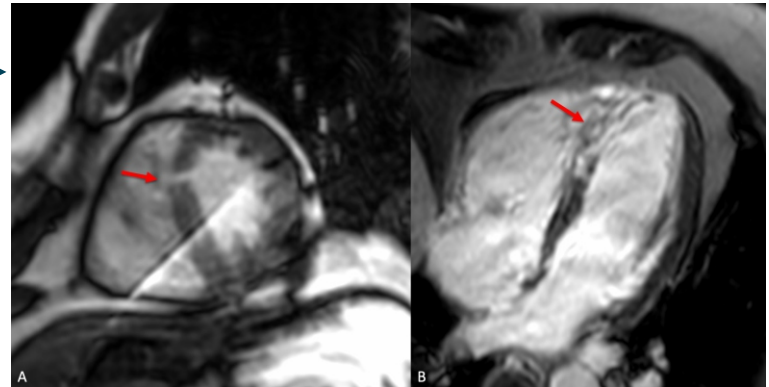
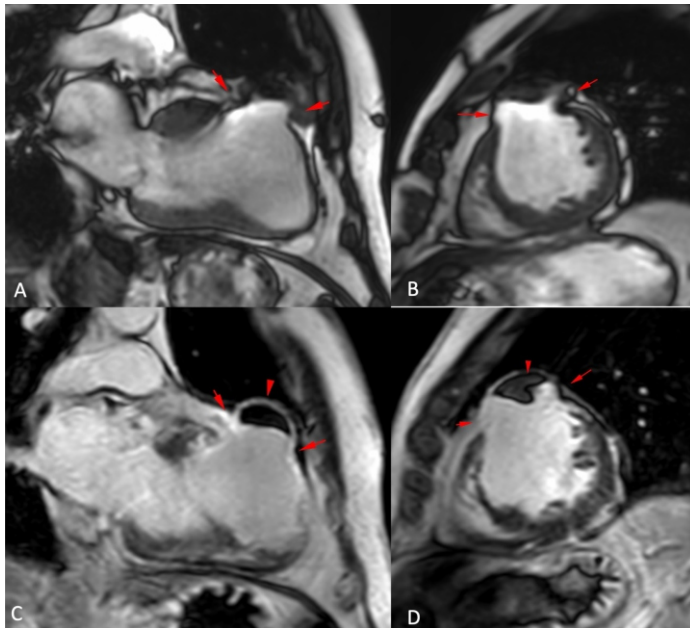


Fig. 4: (A-D): Ventricular free wall rupture. 65-yrs old with acute LAD infarct. The mid anterior wall shows a free wall contained rupture with a thrombus 2 weeks after the infarct in the 2C (A) and SA (B) cine images. The late Gd images in the 2C (C) and SA (D) views show the infarct (arrows) and the thrombus (arrowhead) well.

References:

1. Moreno PR, Fuster V. *JACC Focus Seminar on Mechanical Complications of Acute Myocardial Infarction.* *J Am Coll Cardiol.* 2024 May 7;83(18):1775-1778

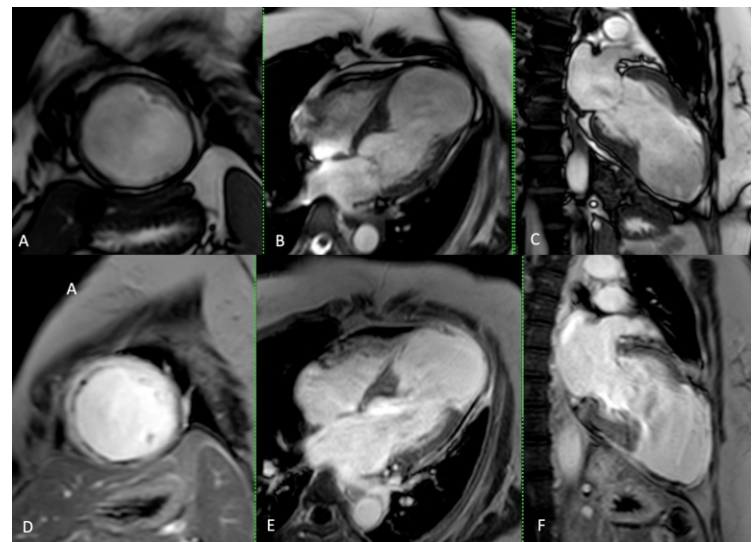


Fig. 5: (A-F): LV aneurysm. 70-years old 3 months after an acute LAD infarct. The SA (A), 4C (B) and 2C (C) cine images show mid and apical LV dilatation. The SA (D), 4C (E) and 2C (F) late Gd images show transmural infarction of all the apical LV segments.

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