Purpose
- Investigate 3D myocardial motion and deformation patterns
- Determine the parameters of relevance to study LAD infarct.

Methods
- 46 patients (baseline [37 sequences] and 1-year follow-up [33 sequences])
- 46 healthy controls

Patients were selected if they had a LVEF<50% or 3 akinetic segments in the LAD territory.

Tracking: 3D speckle-tracking of the LV (QLab prototype), including endo/epicardium at end-diastole/end-systole, and manual corrections on the output.

Post-processing:
- extraction of local radial/circumferential/longitudinal deformation and motion
- spatiotemporally alignment to a common reference to allow for intra- and inter-subject comparisons.

Conclusions
- Generic statistical comparison framework
- Subset of parameters relevant to characterize myocardial viability
- Coherent with physiological improvements at follow-up

Results
- Regions with significant decrease in longitudinal strain coincide with the theoretical LAD infarct localization.
- Lateral segments improved longitudinal strain at follow-up (end-systolic values)
  - AHA#1: $p=0.004$ [baseline] vs. $p=NS$ [follow-up]
  - AHA#11&12: $p<0.001$ [baseline] vs. $p=NS$ [follow-up]
- Abnormalities in circumferential and radial displacement partially overlapped the infarct region, while longitudinal displacement and circumferential/radial strain did not provide relevant information.

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