

Left atrial volume during ventricular diastasis assessed by cardiac computed tomography is an incremental predictor adverse events: a matched control study

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Background and Rationale

- Computed tomographic (CT) coronary angiography (CTA) is increasingly being accepted as a key diagnostic modality for the non-invasive detection of coronary artery disease (CAD)
- To minimize patient radiation exposure, many centres have instituted prospective-ECG gated image acquisition algorithms, whereby image acquisition is restricted to ventricular diastasis when cardiac motion is at a minimum.
- However, this leads to the loss of left ventricular (LV) functional information.
- The ability to derive additional prognostic information from existing prospective ECG-gated CTA data sets would be attractive to clinicians.

Hypothesis and Objectives

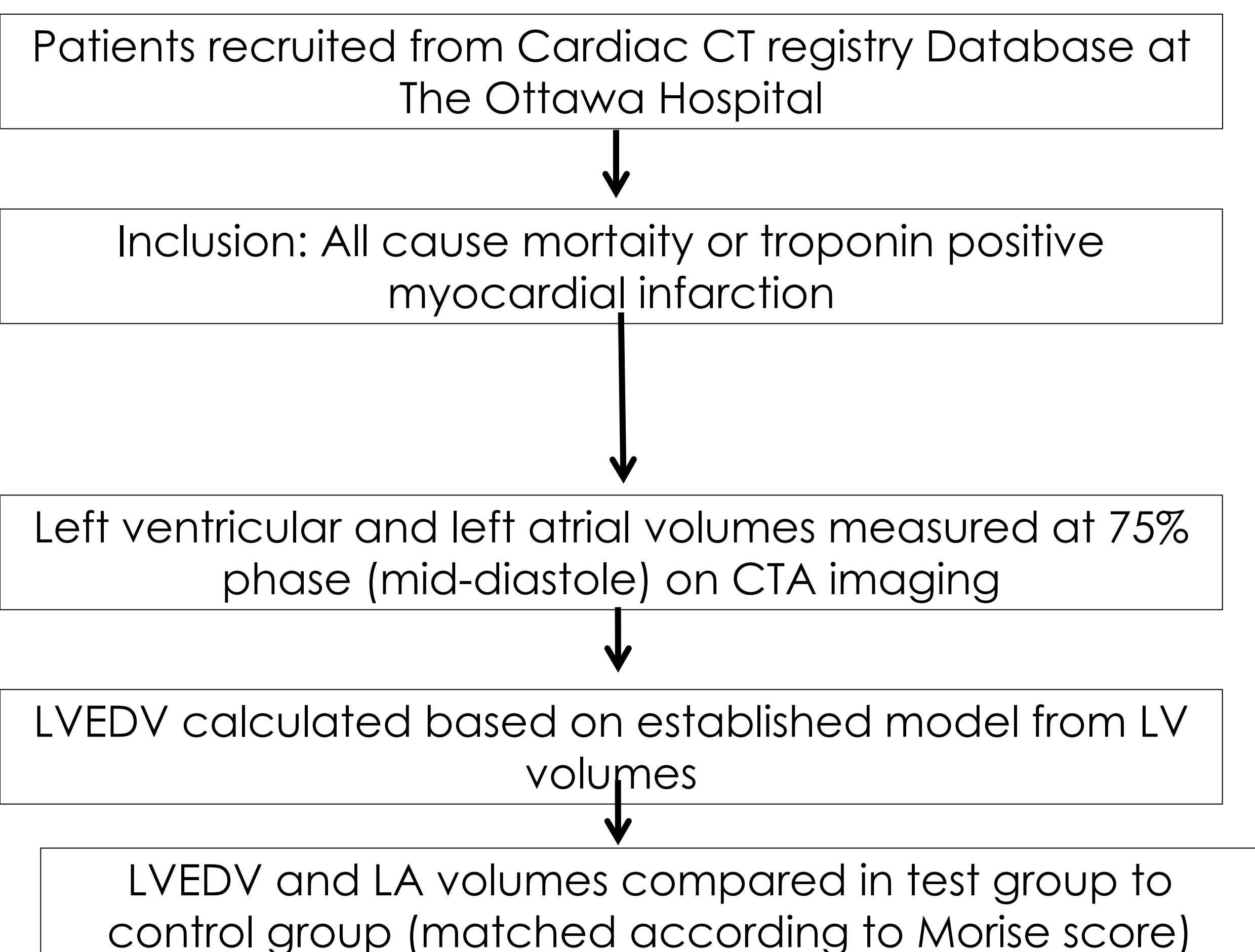
Hypothesis:

- Patients with enlarged left atrial (LA) volumes and enlarged left ventricular end diastolic volumes (LEDV), as demonstrated on CTA imaging will result in higher all cause mortality.

Objectives:

- To determine the relationship between LA volumes, LEDV measure on CTA imaging and all cause mortality.

Methods



Results

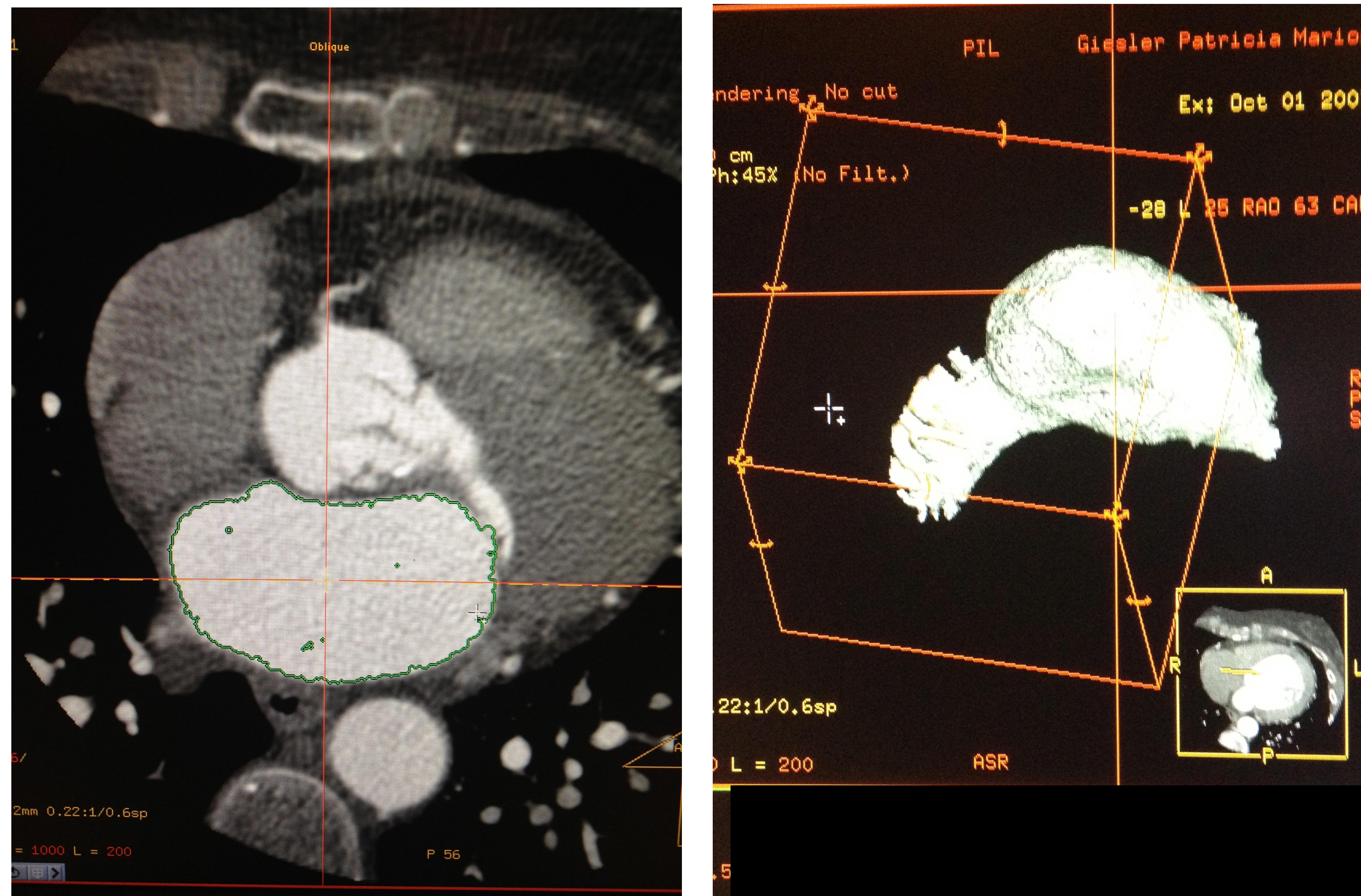


Figure 1: CT (above) scan of heart. A slice by slice approach was used to assess the dimensions of LA and LV. Measurement of LA volume shown (left) and corresponding 3D reconstruction of LA chamber (right)

	Test population	Control Population	P Value
LAV index (75% phase) (mL)	118.68 ± 40.247	100.27 ± 27.93	P=0.0002
Predicted LVEDV index	169.01 ± 84.69	139.19 ± 53.35	P=0.003

Table1: LAV index and predicted LVEDV index of Test and Control populations.

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Results

- Both 75% LAV and predicted LVEDV were significantly larger in patients who experienced hard cardiac events on follow up.
- Both 75% LAV (p=0.001) and predicted LVEDV (P=0.01) were univariable predictors of adverse events.
- However, on multivariate analysis only 75% LAV predicted adverse events.

Conclusion

- Significantly larger LAV during ventricular diastasis and predicted LVEDV are seen with patients who experienced adverse events on follow-up.
- LAV assessed during ventricular diastasis by CT is an incremental predictor of adverse events.

Future Direction

- Applying the same principles as shown in this study, **right** atrial and ventricular volumes will be analyzed to see if there is any correspondance to adverse events.

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