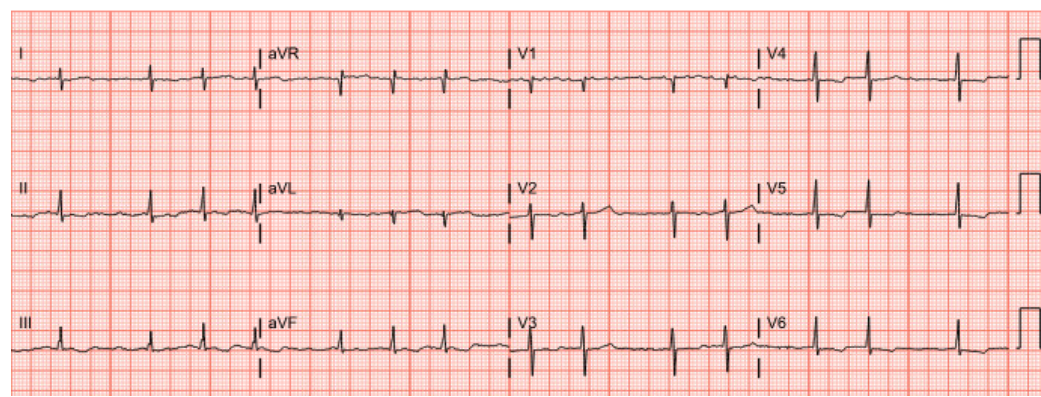


# ECG, Echo, Nuclear Imaging and MRI in Cardiac Amyloidosis

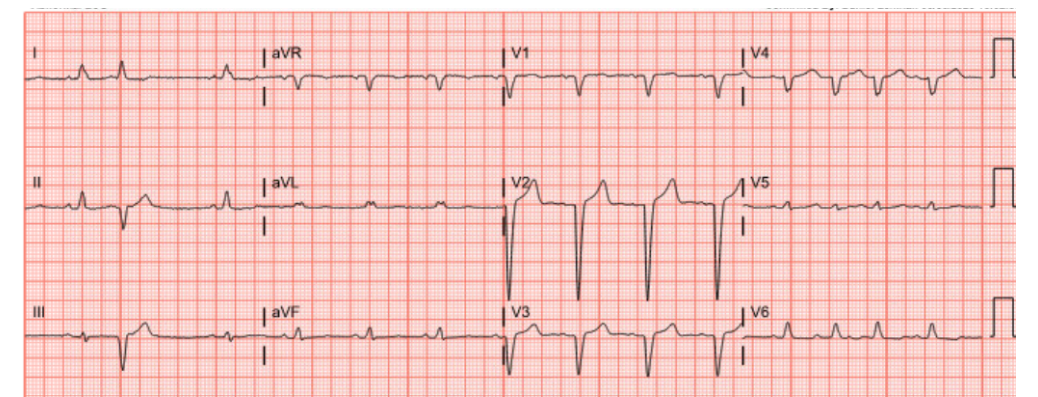
## Classic Characteristics of Each Modality



Atrial fibrillation and low voltages throughout

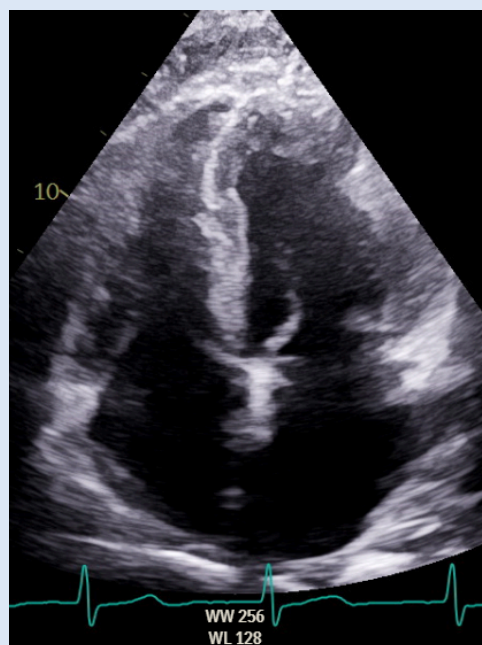
### Electrocardiography (ECG)

Classic ECG findings in Cardiac Amyloidosis (CA) are predominantly a discordance between hypertrophy seen on imaging and **low voltages** on ECG. Conduction abnormalities, **Q waves without infarction**, and atrial fibrillation are common but not specific to CA.

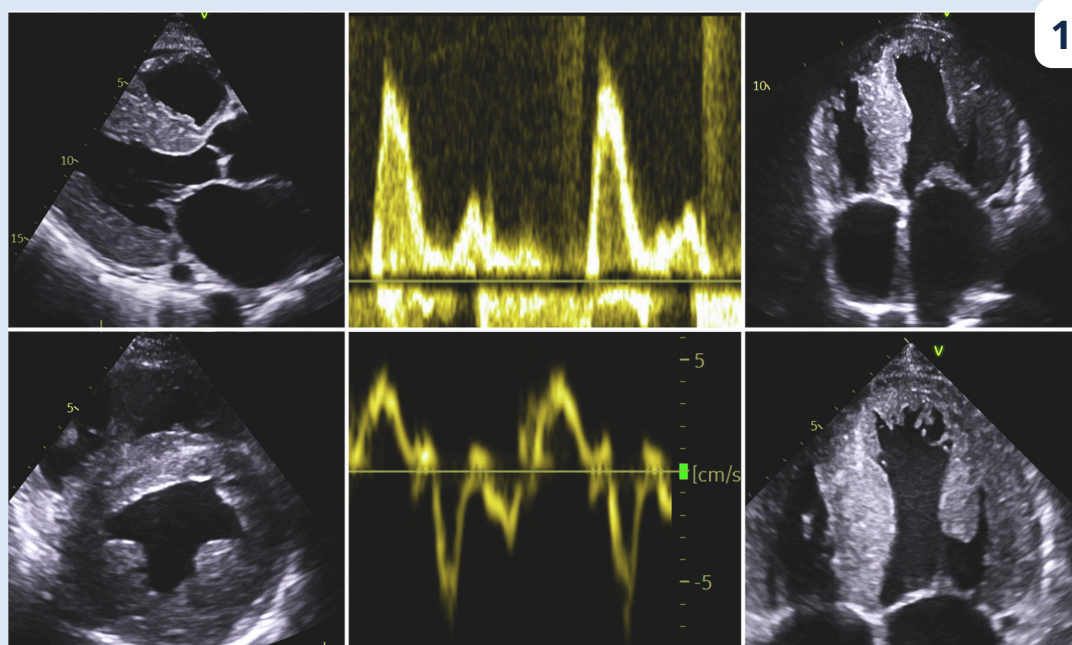


Pseudoinfarction, "Q waves without actual infarction"

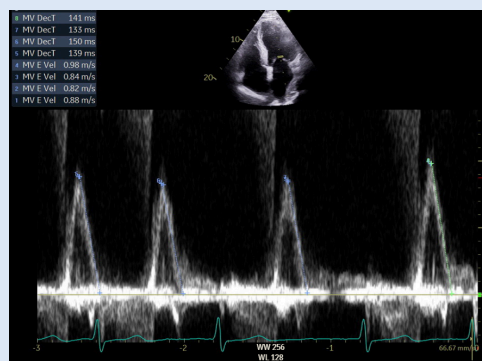
### Echocardiography Imaging With Doppler



Early mild involvement

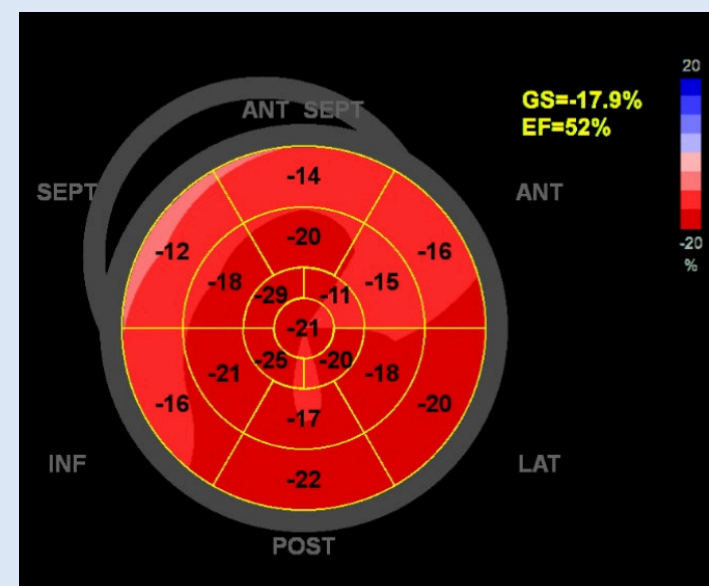


More severe infiltration

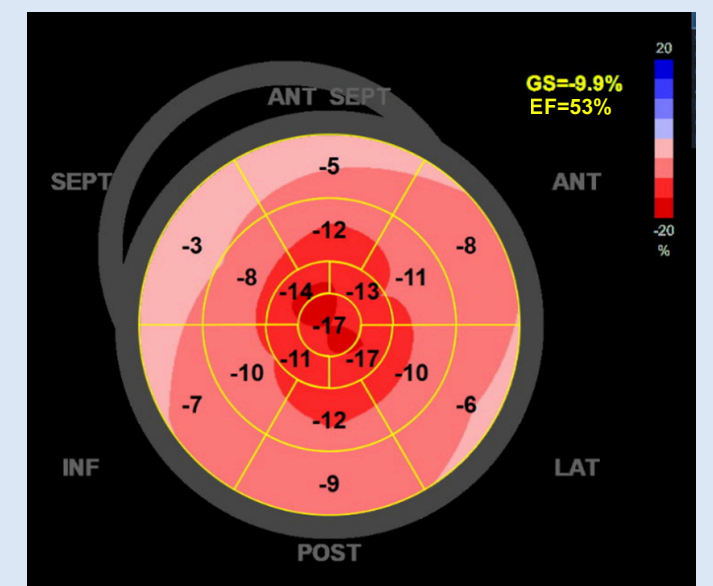


- Increased wall thickness
- Biatrial enlargement
- Diastolic dysfunction
- Elevated filling pressures

### Global Longitudinal Strain Bulls Eye Plot



Mild

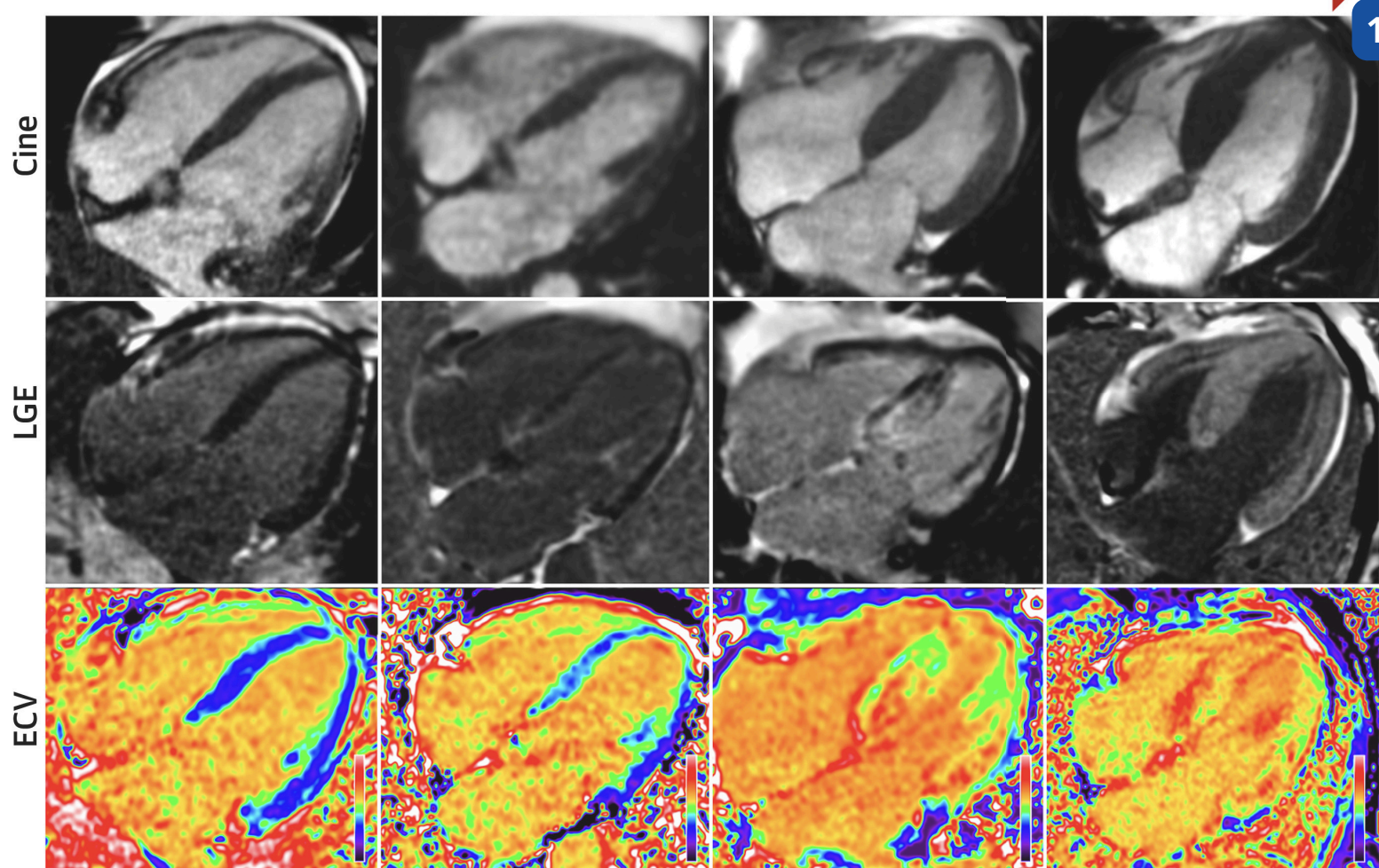


More severe

**Global longitudinal strain (GLS)** can be obtained with imaging. The **Bull's Eye Plot** shows regional strain values from the apex (center) to the base (outside edge). Normal strain value is -17% to -22% (deep red). Less negative strain values are lighter color and reflect poorer contraction. The **apical sparing pattern** relates to normal apical strain but worse basal strain values.

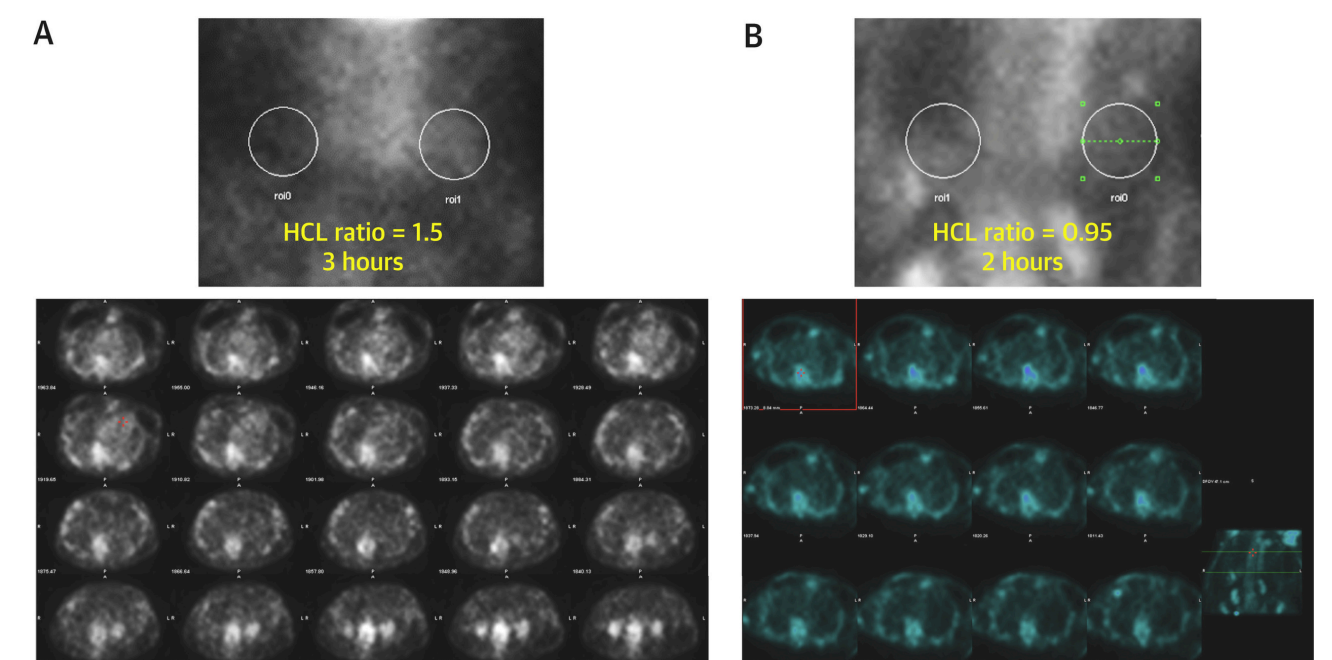
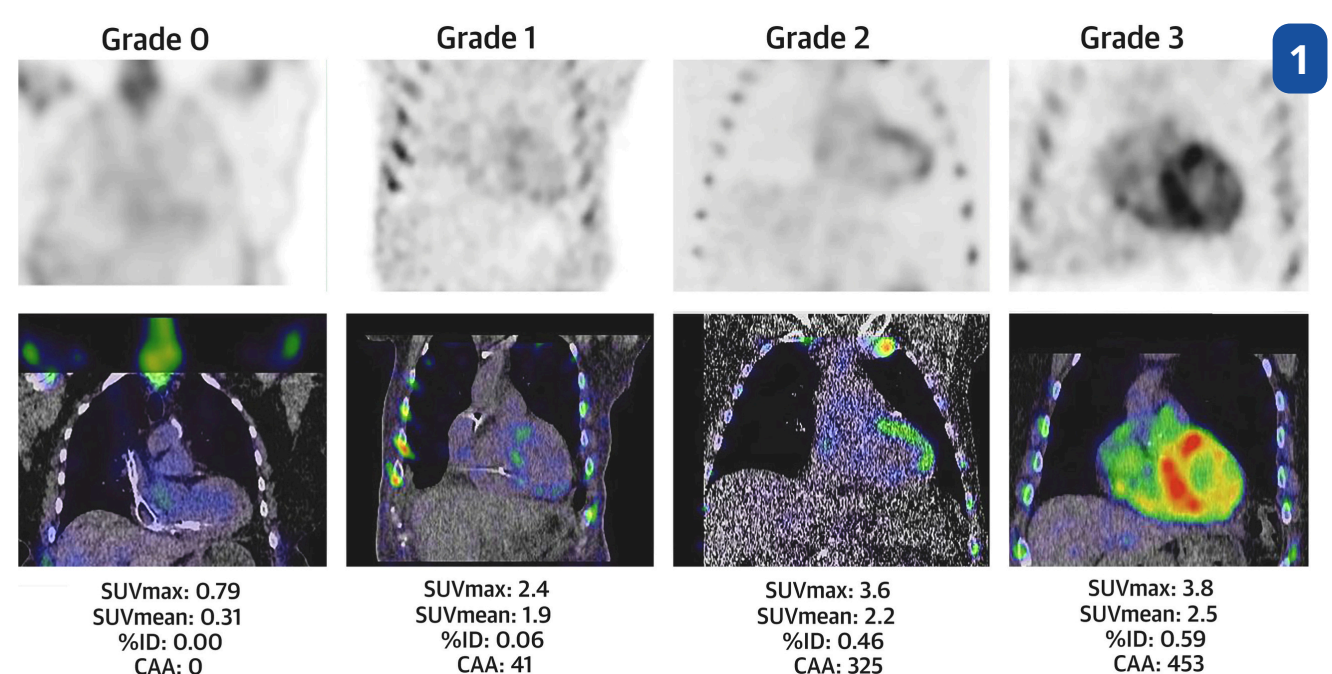
### Cardiac Magnetic Resonance (CMR)

Increasing amyloid deposition →



- Increased biventricular thickness and biatrial enlargement
- Late gadolinium enhancement (LGE) is usually diffuse throughout the myocardium but can be patchy
- Extracellular volume (ECV) elevation occurs early and may be a parameter to follow for treatment response

### Technetium Pyrophosphate Scan



Grade 2/3 uptake and Heart Lung Ratio >1.5 are highly suspicious of TTR amyloidosis

### References:

1- The Last Decade in Cardiac Amyloidosis: Advances in Understanding Pathophysiology, Diagnosis and Quantification, Prognosis, Treatment Strategies, and Monitoring Response. Marianna Fontana. (2025). JACC Cardiovascular Imaging. DOI: 10.1016/j.jcmg.2024.10.011