Heart Failure – White is scar?

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Disclosures

- **Janssen Advisory Board**
- **Takeda Advisor Board**

Clinical History

- 48F, referred to the Cardio-oncology Clinic due to "cardiac history / arrhythmia" before starting ACT
- Originally from Ecuador
- R breast CA, ER+, PR+, HER2 negative

Clinical History

- PMHx
  - ? Cardiomyopathy started on Ramipril (Stopped 1 year ago), ?prior anticoagulation? Seen by a cardiologist
  - Grave's disease (90s) – oral meds / radioactive iodine
  - Hypertriglyceridemia
- Meds
  - Synthroid 0.175mg OD
- Social Hx – No smoking, 3 alcoholic beverages per week, no recreational drugs

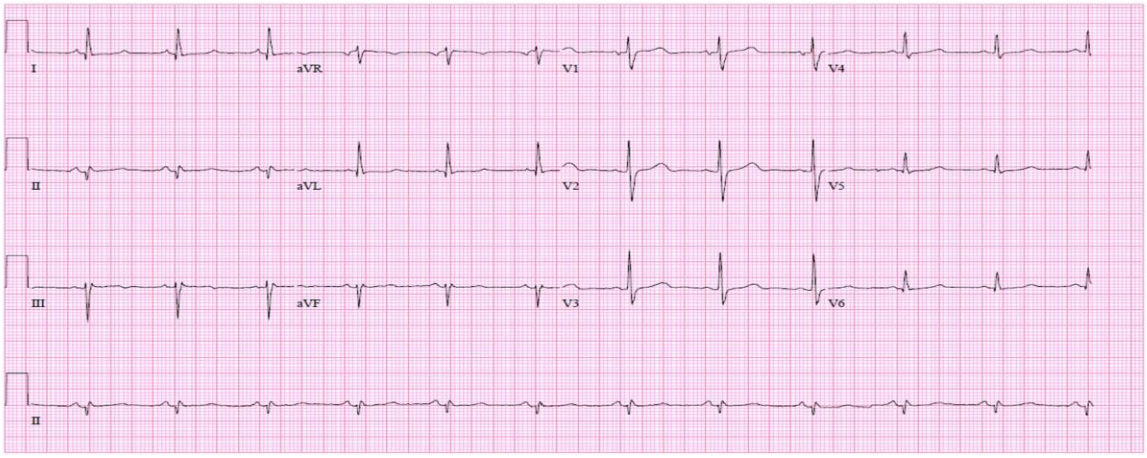
Clinical History

- Family history
  - Aunt died in 20s after a diagnosis of "epilepsy" in Ecuador
  - Twin brother – told that he has "fatty infiltration around his heart"
  - No other history of SCD
- HPI – no HF or anginal symptoms, no palpitations, syncope

Clinical History

- O/E
  - BP 100/60, HR 84 (reg), JVP not elevated, lungs clear, no peripheral edema
  - No S3, no murmurs

Investigations



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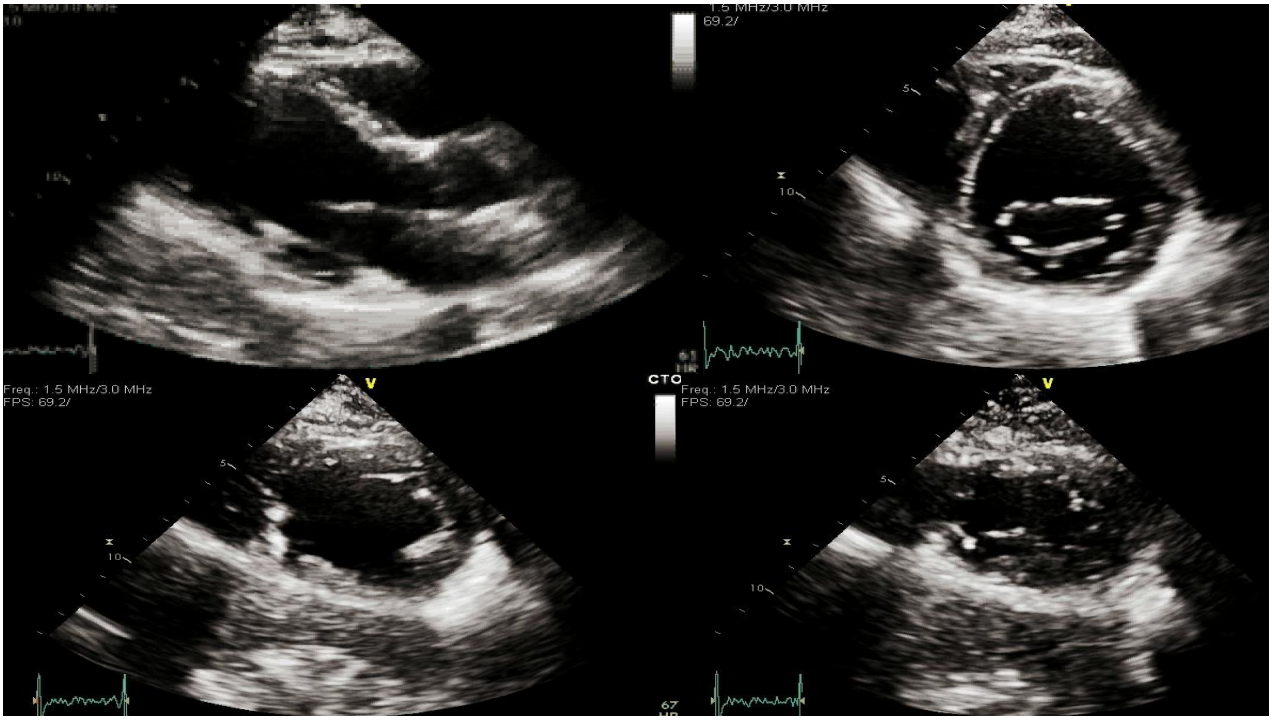
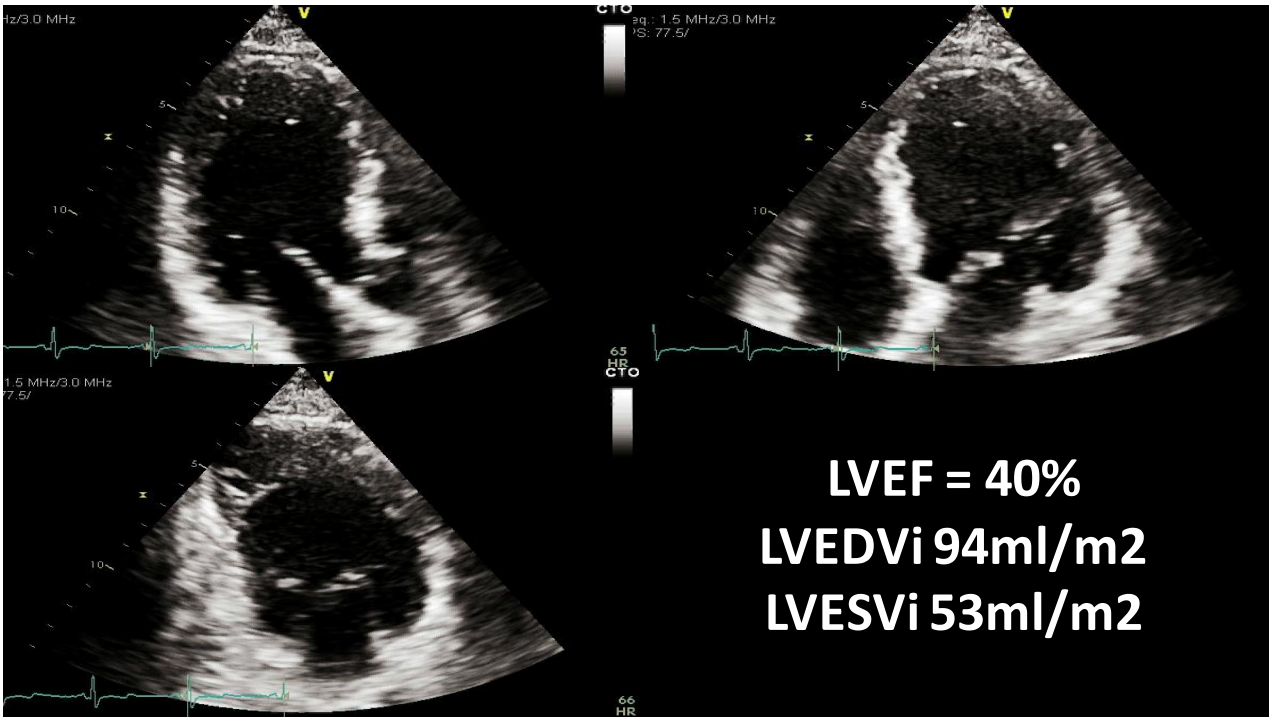
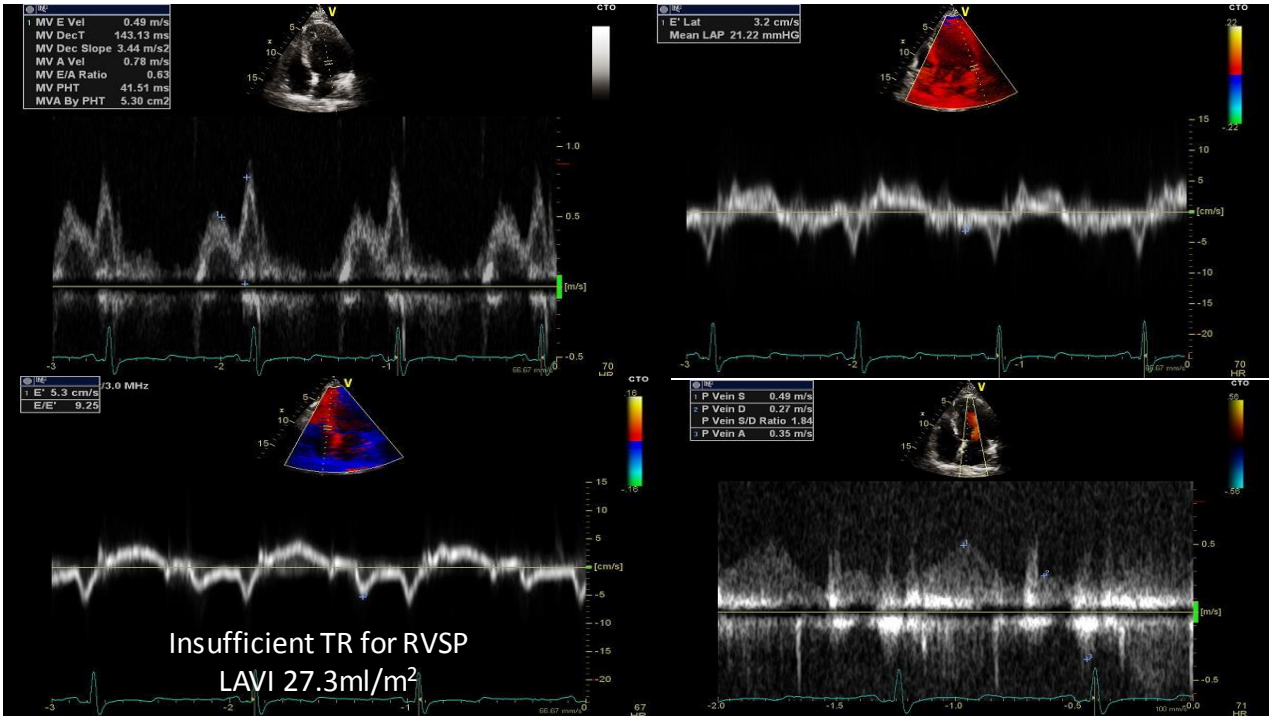
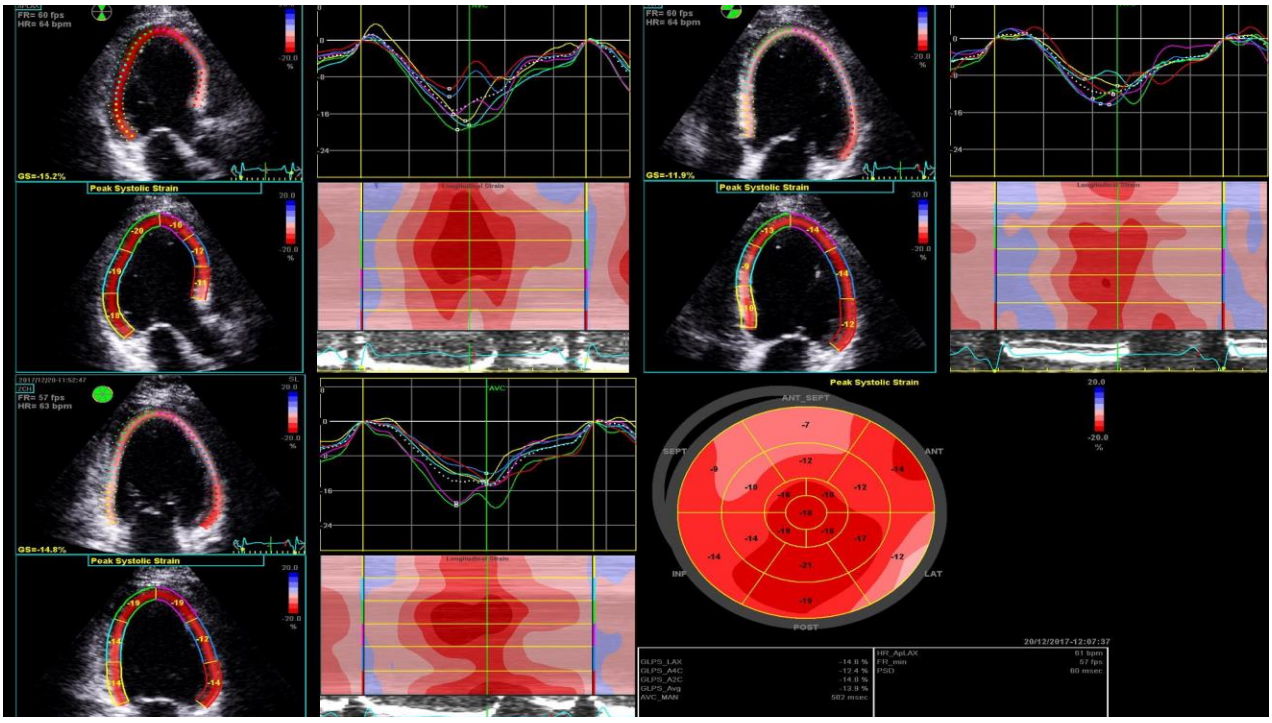



LVEF = 40%
LVEDVi 94ml/m2
LVESVi 53ml/m2


MV E Vel 0.49 m/s
MV DecT 143.13 ms
MV Dec Slope 3.44 m/s2
MV A Vel 0.78 m/s
MV E/A Ratio 0.63
MV PHT 41.51 ms
MVA By PHT 5.30 cm2
E' Lat 3.2 cm/s
Mean LAP 21.22 mmHG
E' 5.3 cm/s
E/E' 9.25
P Vein S 0.49 m/s
P Vein D 0.27 m/s
P Vein S/D Ratio 1.84
P Vein A 0.35 m/s
Insufficient TR for RVSP
LAVI 27.3ml/m2



Management

- To investigate potential causes – cardiac CT and cardiac MRI ordered
- With the LV dysfunction started on
  - Ramipril 2.5mg OD
  - Bisoprolol 2.5mg OD

- Clinical history from prior cardiologist

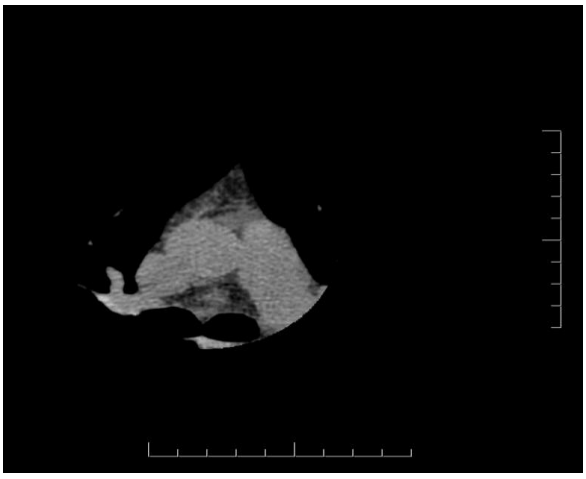
Management

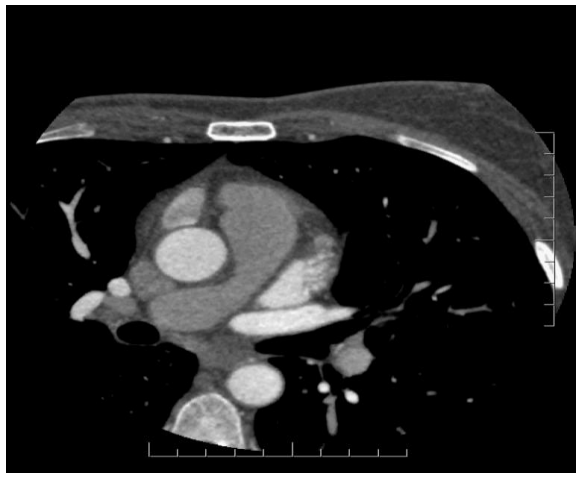
- Cancer - cyclophosphamide and docetaxel x 6 cycles
- Followed by right mastectomy and radiotherapy

Prior Cardiologist

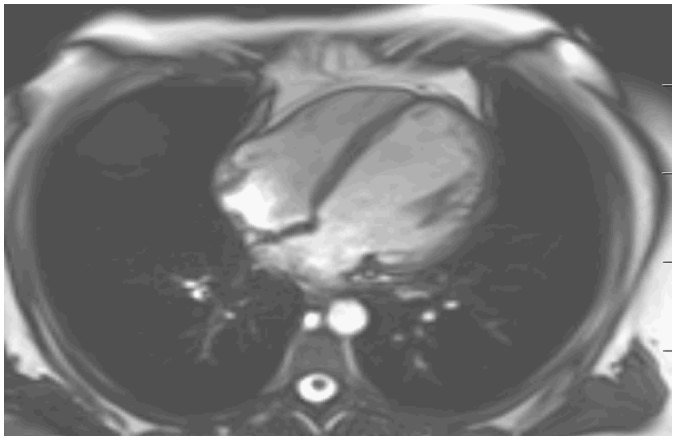
- Seen in 2015, SOB x 18 months
- LVEF 40% (2014), Normal size LV initially
- Subsequently LVEF reported at 45% in 2015 (definity)
- Started on ACE (Aug 2015)
- Diagnosis – DCM, no further investigations
- No records of anticoagulation

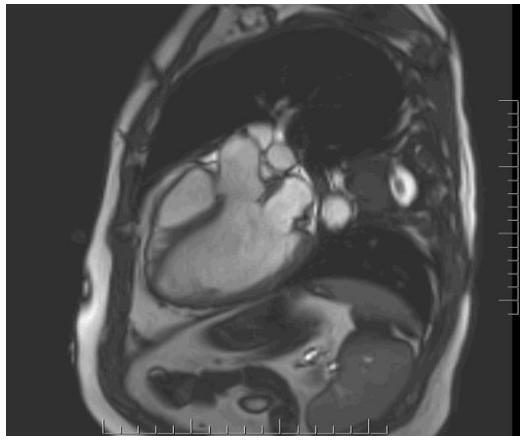
Cardiac CT



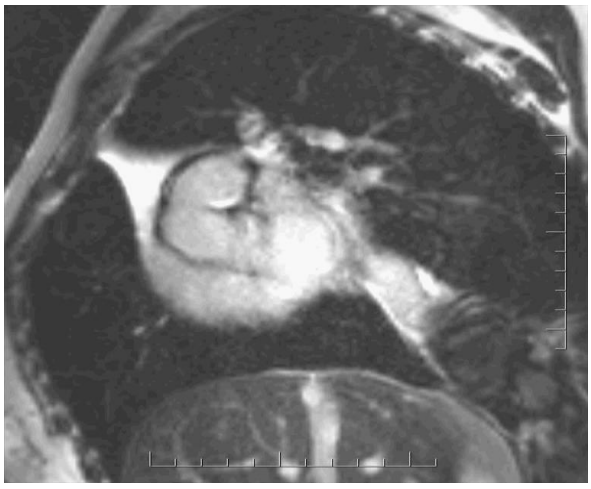


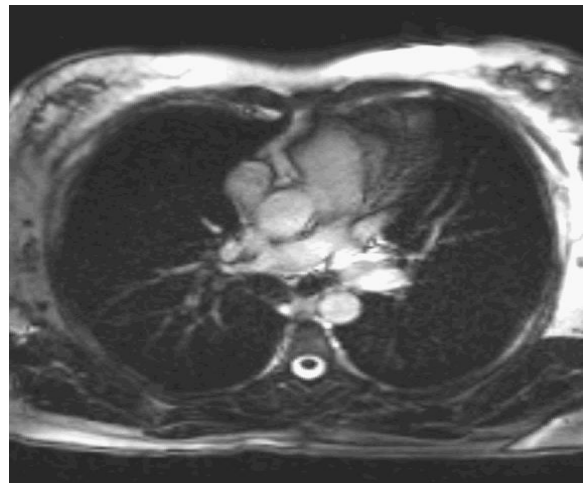
Cardiac MRI





Cardiac MRI





Cardiac MRI

- LVEF 36%, global hypokinesis, mildly dilated (108ml/m^2)
- RVEF – moderate dysfunction, no regional abnormalities
- Non-ischemic pattern of LGE with prominent epi- and sub-epicardial LGE at base, mid LV, and apex.
- DDx – myocarditis, ALVC, muscular dystrophies, other

What is the diagnosis?

1. Ischemic CM
2. Muscular dystrophy
3. Myocarditis
4. Need more investigations

Endomyocardial Biopsy

- No evidence of inflammatory or infiltrative process
- Areas of significant interstitial fibrosis
- Large areas with loss of muscle fibers

- Unable to comment on cause

Endomyocardial Biopsy

- Electron microscope
  - Surprising presence of fibrillar and interstitial deposits with fibril size of 8-12nm
  - Appearance of these fibrils and size is that of amyloid fibrils
  - Mild ultrastructural change in individual muscle fibers and dilatation of sacrotubular system

Blood molecular diagnostics

- UPEP / SPEP - negative
- For TTR amyloid – none of the variants for the Hereditary Panel detected

Additional Shocking History

- 23 year old daughter was found dead at home
- Genetic testing showed variants of uncertain significance in
  - DSP – associated with autosomal dominant ARVC and DCM, clinical significance unknown
  - PKP2 – associated with autosomal dominant ARVC, Brugada, and DCM, significance unknown
  - SLC22A5 – autosomal recessive carnitine def

Management

- Seen in our inherited arrhythmia clinic
  - Exercise stress test – 7 minutes (Bruce), max HR 130 (<85% MPHR), normal BP response, rare PVCs
  - 14 day Holter – NSR throughout, PVCs <1%, 9 runs of NSVT, longest 5 beats (103bpm), fastest 4 beats 131 bpm

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Management

- Risk stratification with EP study or ICD
- She wanted to think about the options
- Family referred for cardiac testing
- Exercise limitation suggested
- Titration of cardiac medications

Management

- Genetic panel done
  - DSP positive!
  - This is most likely left dominant arrhythmogenic cardiomyopathy

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Conclusions

- Arrhythmogenic CM, LV involvement common in autopsy (76% have RV involvement)
- Likelihood of LV involvement increases with age
- Left dominant involvement in ~5% of patients
- More commonly identified with increasing use of CMR – sub-epicardial / mid wall LGE
- DSP mutations more commonly associated with LV involvement

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