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Tako Tsubo Cardiomyopathy

- **Transient left ventricular (LV) apical ballooning syndrome**
- **Broken heart syndrome**
- **Stress induced myocardial stunning**

History

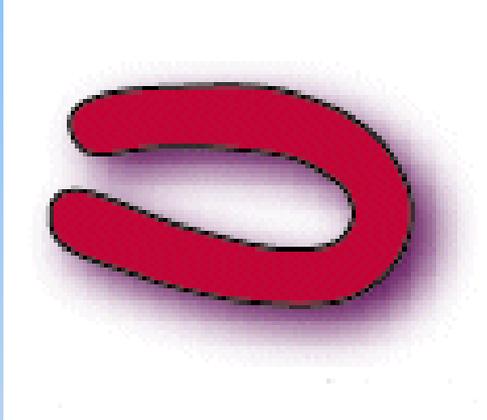
First described in 1991 by Japanese interventional cardiologists Dote and his team and named tako tsubo-like LV dysfunction in reference to the associated LV morphological features

What Tako-Tsubo means?

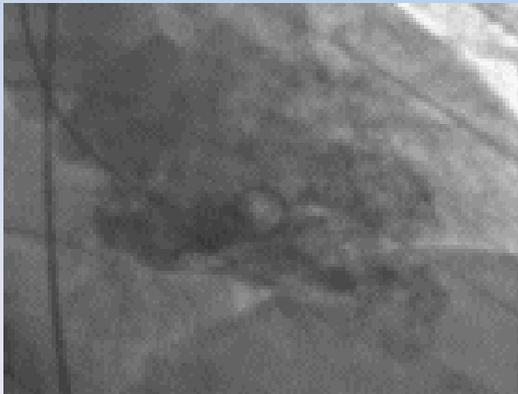
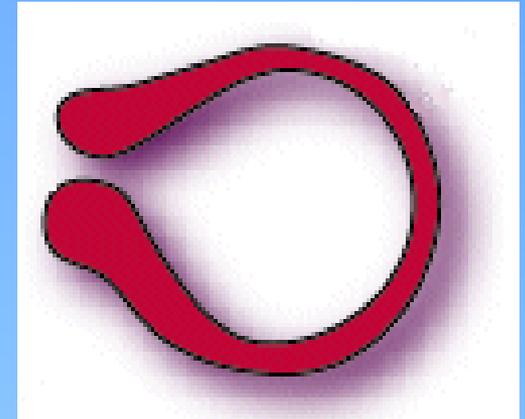
- 👉 „Tako“ = octopus „Tsubo“ = pot
- 👉 **Takosubo** is a pot with a round bottom and narrow neck used for trapping octopuses in Japan



Normal LV contraction



Apical ballooning



LV graphy



3 month later

Epidemiology

- ❑ **1- 2% of cases diagnosed as acute coronary syndrome**
- ❑ **mostly affects women in their post-menopausal age**
- ❑ **often emotional or physical stress**

Etiology & pathophysiology

 **Unclear**

→ Catecholamine mediated cardio-toxicity

→ Coronary microvascular constriction

Clinical and imaging characteristics of TTC

- 👤 **Chest pain**
- 👤 **ECG changes (STE, STD, TWI)**
- 👤 **Slightly raised Troponin**
- 👤 **Transient LV dysfunction**
- 👤 **TTC imitates ACS**
- 👤 **Frequently misdiagnosed as an acute coronary syndrome**

The diagnostic criteria according to Mayo Clinic are as follows:

-  **New abnormalities on ECG (ST-segment elevation and/or T-wave inversion) and/or cardiac Troponin elevation**
-  **Transient (reversible) akinesia or dyskinesia of the left ventricular mid segments, eventually also with involvement of the apex, independently of vascular distribution**
-  **Absence of obstructive coronary artery disease at coronary angiography**
-  **Absence of Myocarditis or Pheochromocytoma**
-  **Original criteria also included an absence of head injury or intracranial haemorrhage**

Treatment

-  **Symptomatic**
-  **Supportive**
-  **Analgesia**
-  **Oxygen**
-  **Diuretics**
-  **ACEI**
-  **BB**
-  **Inotrops and IABP in cardiogenic shock**

Prognosis

- 👉 **in-hospital mortality is around 2%**
- 👉 **Long-term prognosis is mostly favourable with complete resolution**
- 👉 **Recurrence of TTC around 5%**

Complications

-  **Cardiogenic shock**
-  **Arrhythmia**
-  **Pulmonary oedema**

In a snowy mountain range of an unfortunate stressed, resentful and angry giraffe running after some scrumptious food.

Conclusion from this study: Even maximally stressed giraffes don't get tako-tsubo syndrome.....

But there is no need for those fancy experiments..... how about studying non-human primates stuck for life in zoos? I would not be surprised that some tako-tsubo cases could be found there..... future will tell....



Case presentation

56 y/o female presented to the Emergency with chest pain and hypertension after a car accident when she was annoyed due to indecency of the second participant in this accident .

Case presentation

Blood tests

- Troponin-I level 0.48 $\mu\text{g/L}$
- Max TNI 0.72 $\mu\text{g/L}$
- (normal values 0.014 $\mu\text{g/L}$)

➤ TTE on admission

posterobasal hypokinesis of the inferior wall
and slightly reduced LFSF

- ECG Q wave in III,aVF with TWI in I, III,aVF and in lead V5-V6

Case presentation

- patient has received Clopidogrel+ASA-LMW heparin as per ACS protocol
- transferred to the Cath Lab
- Coronary angiography & Ventriculography
 - normal coronary arteries
 - posterobasal hypokinesis of inferior wall
- an atypical pattern of Tako-Tsubo cardiomyopathy was suspected
- two days later patient was D/C home
- **Medication:** metoprolol 25mg once daily ASA 100 mg once daily
- ECG and TTE on discharge showed the same finding as on admission
- patient was F/U for 2/12

Case presentation

- 2nd TTE 2/52 after discharge
only slight posterobasal hypokinesis of inferior wall
- CMRI confirmed
posterobasal hypokinesis of inferior wall
- No scar in the myocardium, as a sign of AMI was found in the late gadolinium enhancement
- 3rd TTE 5/52 after discharge
normal segmental and global left ventricular function was found
- ECG showed no Q wave or T wave inversion in inferior leads

Conclusion

The findings in cardiac MRI, as well as the complete resolution of ventricular wall motility and rearrangement of the ECG , were thus consistent with the first proposed diagnosis of TTC.

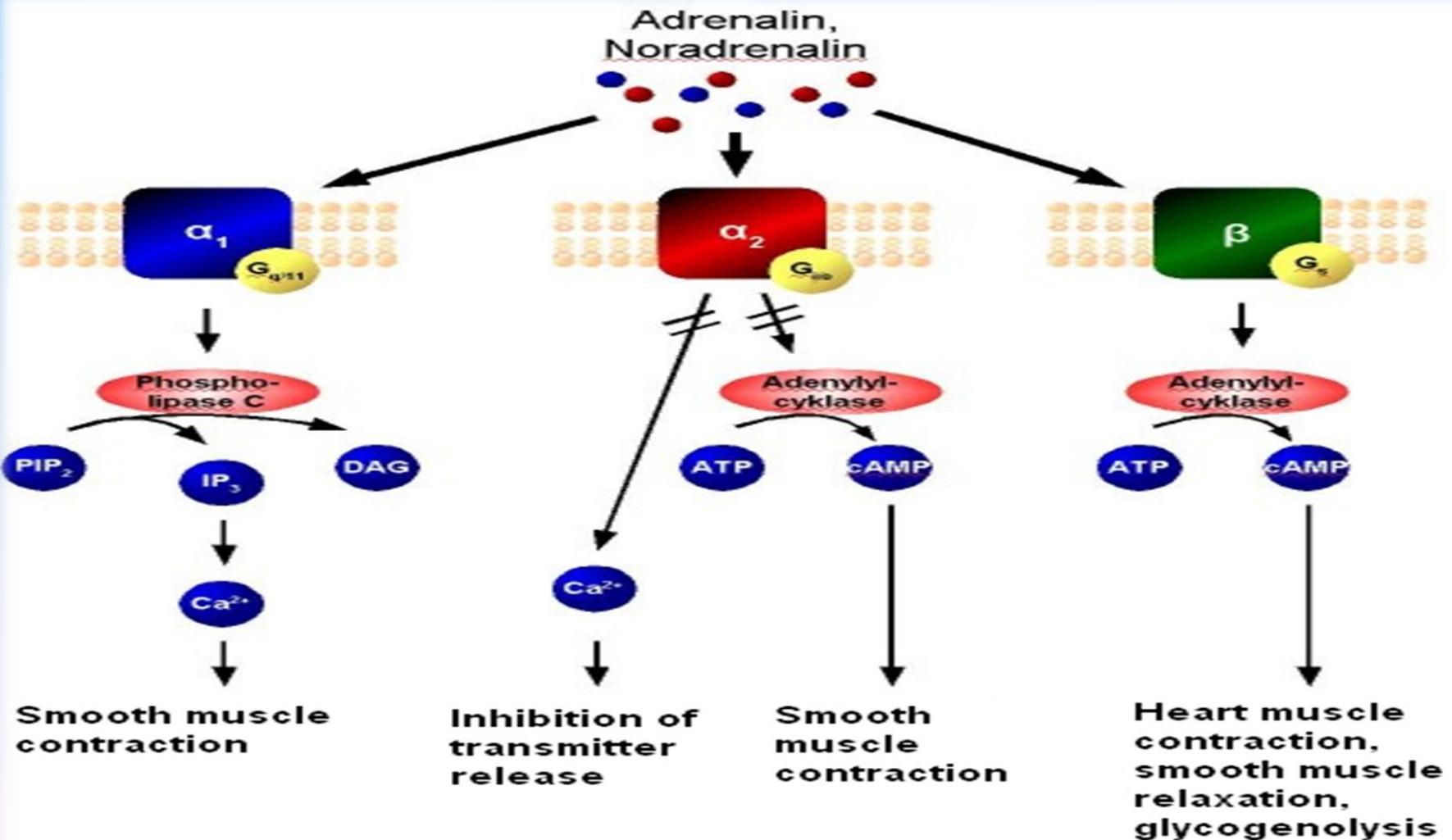
References

A.Q.Negahban, et al. ,Uncommon type of Tako–Tsubo cardiomyopathy ’ Case report and current view
Cor et Vasa (2013)
<http://dx.doi.org/10.1016/j.crvasa.2013.09.004>



***Thank You for
listening***

What support Catecholamine mediated theory?

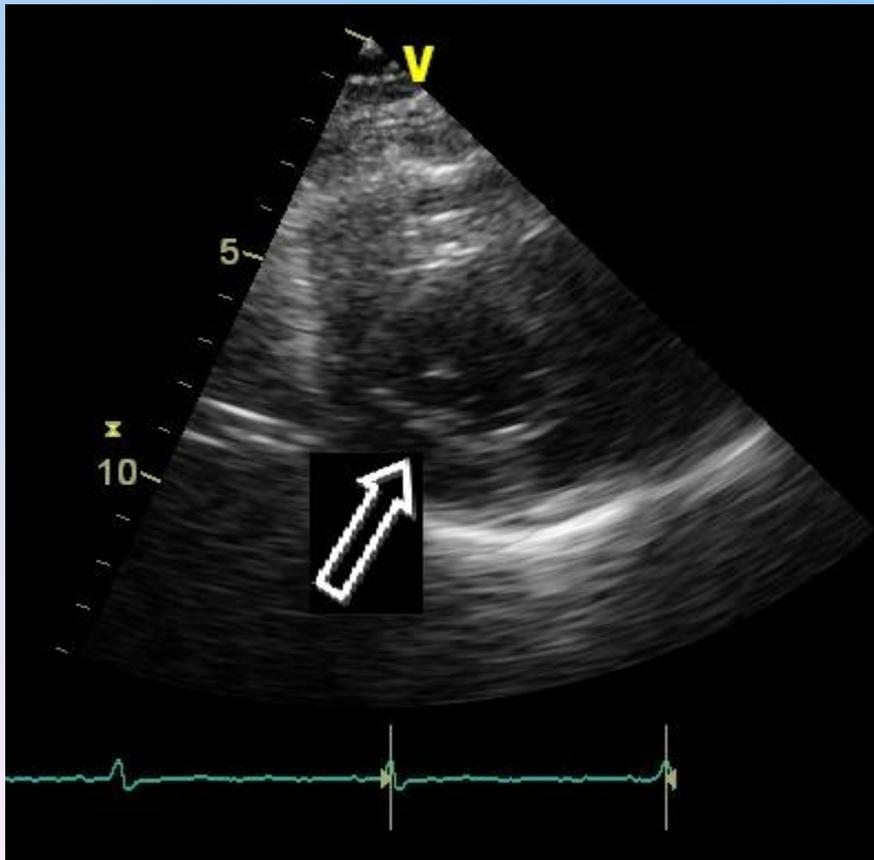


What support micro-vaso-constriction theory?

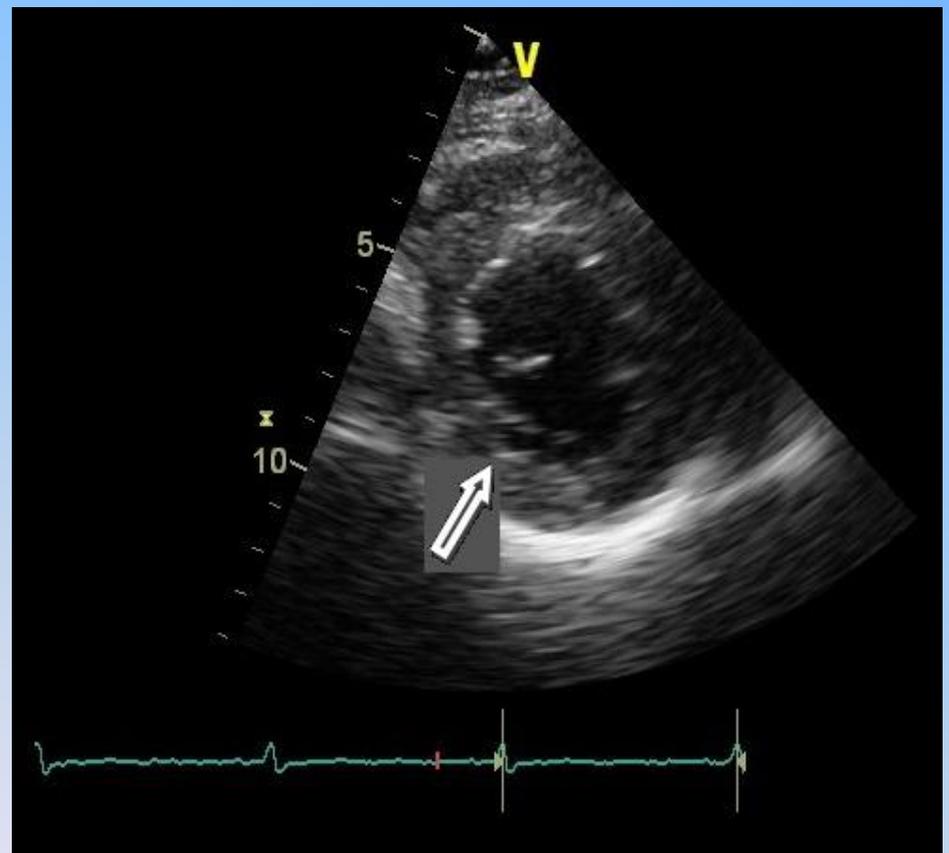
- ❖ **Effect of Adrenaline/Noradrenaline on α_1 and α_2**
- ❖ **TIMI frame count showed impaired microcirculatory flow**
- ❖ **PET – reversible impairment of coronary flow reserve**
- ❖ **Contrast ECHO showed impaired myocardial perfusion**

ECHO on admission

Parasternal short axis (PSAX)
at the level of papillary muscles
End-diastole – area of hypokinesia
(arrow)

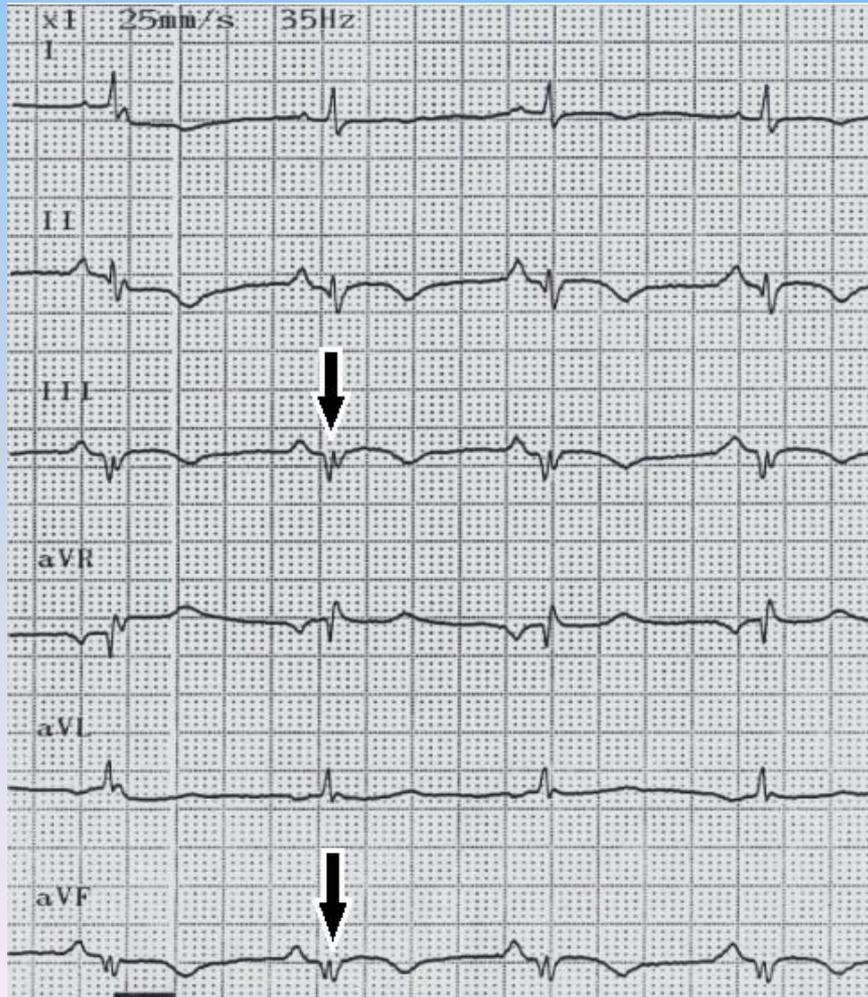


PSAX at the level of papillary
muscles
End - systole area of hypokinesia
(arrow)

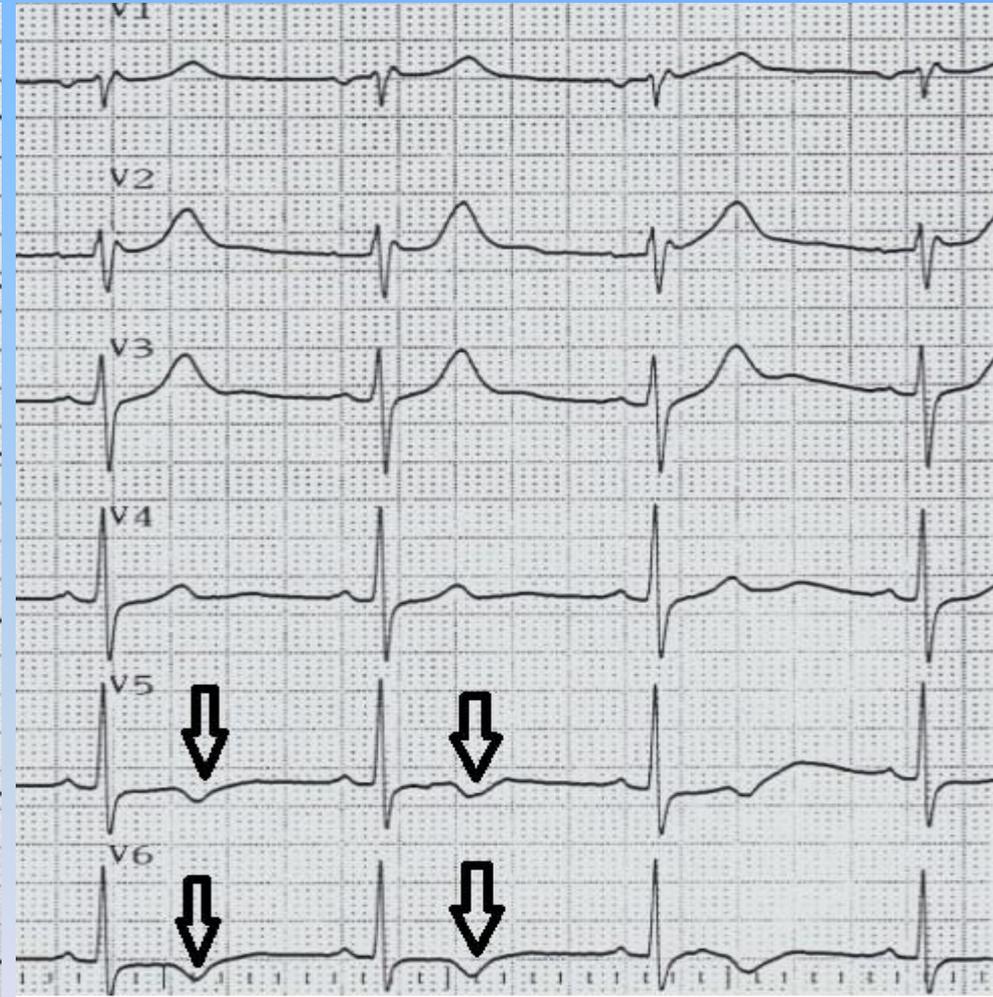


ECG on admission

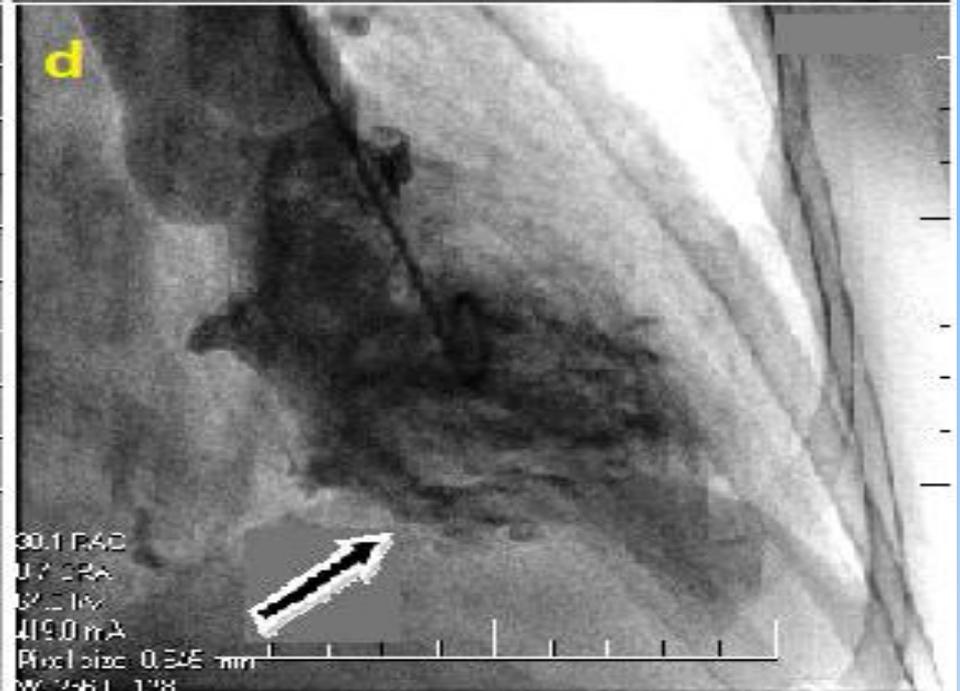
Extremity leads, Q wave in III, aVF
(arrows)



Chest leads, negative T wave in V5-V6
(arrows)

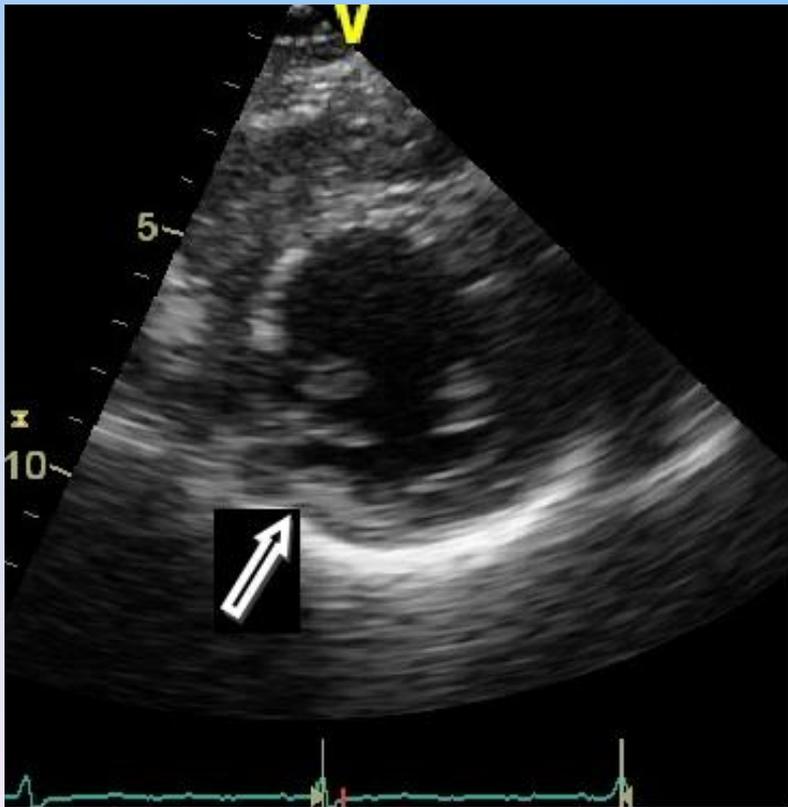


Coronary Angiogram & Ventriculogram

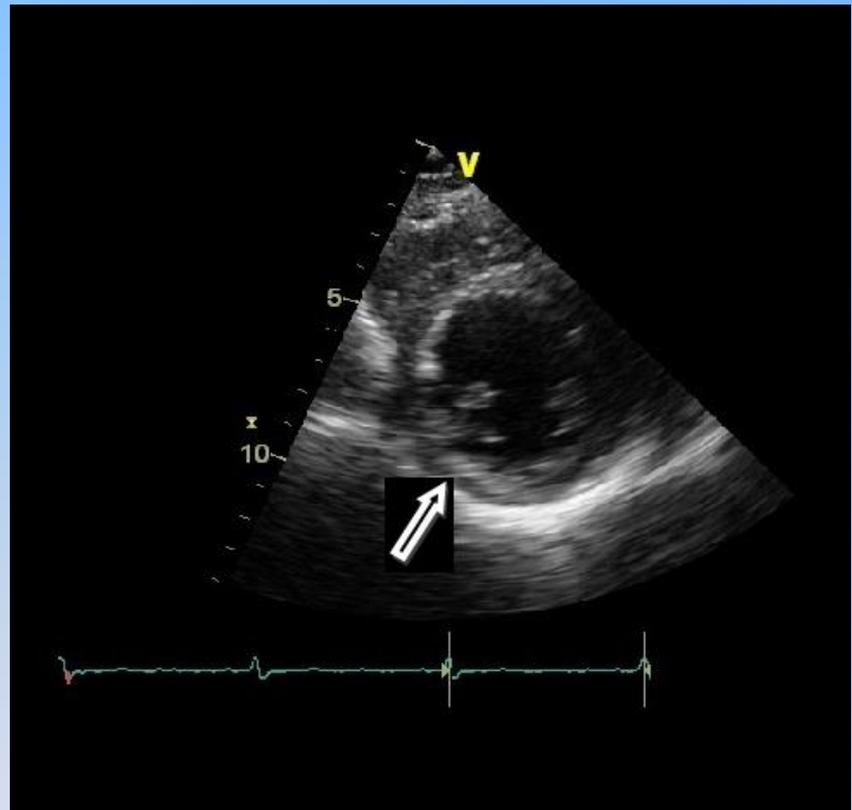


ECHO 2/52 after D/C

Parasternal short axis (PSAX)
at the level of papillary muscles
End-diastole – area of hypokinesis
(arrow)

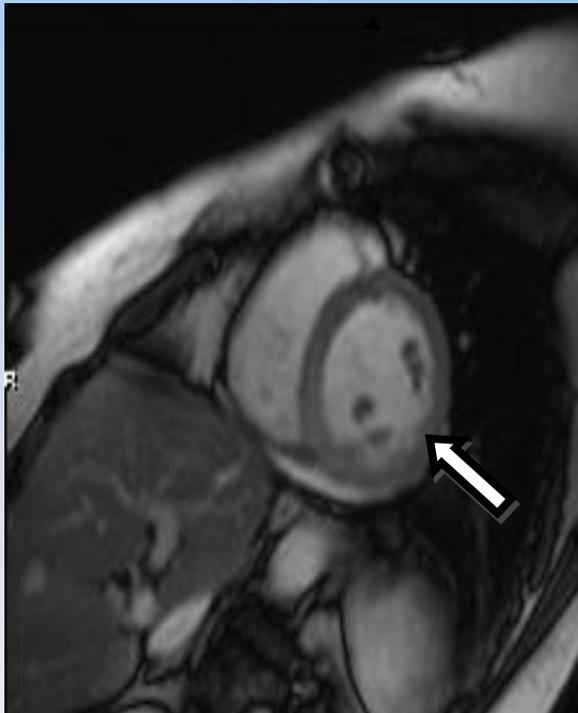


PSAX at the level of papillary
muscles
End - systole area of hypokinesis
(arrow)



Cardiac MRI

T1 IR sequence after injection of contrast medium (Gadolinium)
Short axis view (SAX)
No Late Gadolinium Enhancement finding
Area of hypokinesis (arrow)



T1 IR sequence after injection of contrast medium (Gadolinium)
Left ventricular outflow tract (LVOT) view
Area of hypokinesis (arrow)
No Late Gadolinium Enhancement finding

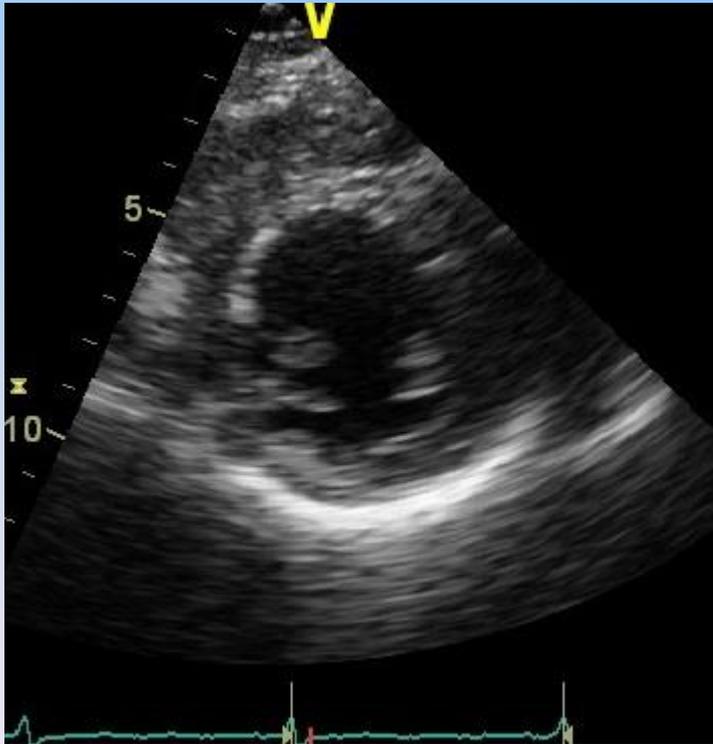


T1 IR sequence after injection of contrast medium (Gadolinium)
Left ventricular outflow tract (LVOT) view
Area of hypokinesis (arrows)
No Late Gadolinium Enhancement finding

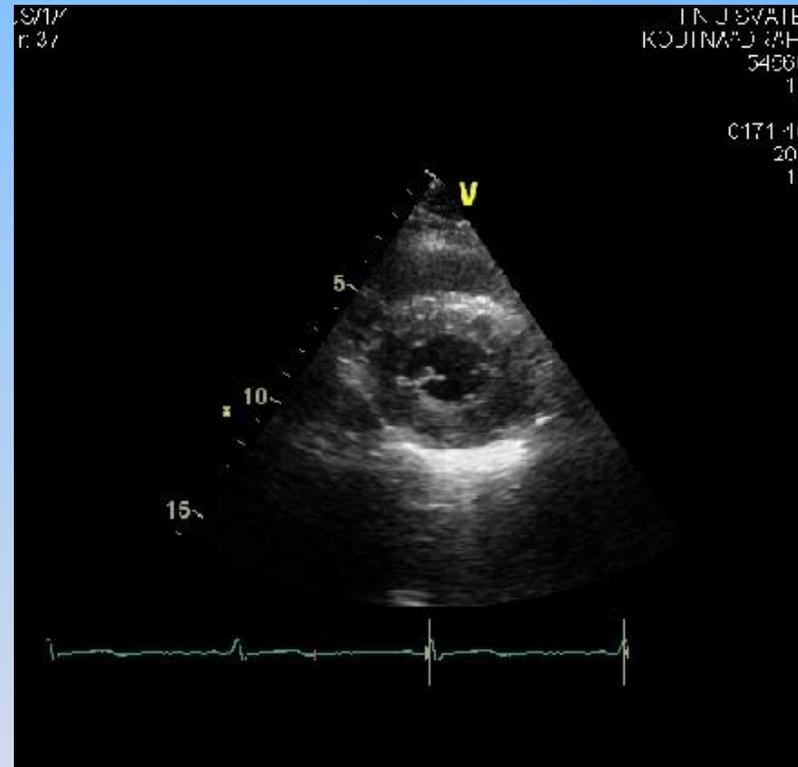


ECHO 5/52 after D/C

Parasternal short axis (PSAX)
at the level of papillary muscles
End-diastole – No hypo kinesis-
complete Recovery



PSAX at the level of papillary
muscles
End - systole No hypo
kinesis - complete Recovery



ECG 5/52 after D/C

