Case presentations

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Pulmonary edema in a patient with mechanical mitral prosthesis

- 80 years old patient with RHD
- S/P MVR + CABG 10 years ago
- 7 years ago she presented with pulmonary edema –**mechanical ventilation – F.C IV**
- INR < 2 for several days
- History of PVD and carotid disease
- Mild LV dysfunction
- Limited mobility
- Technically difficult surgery 10 years ago with prolong recovery

TTE – CW Doppler on admission

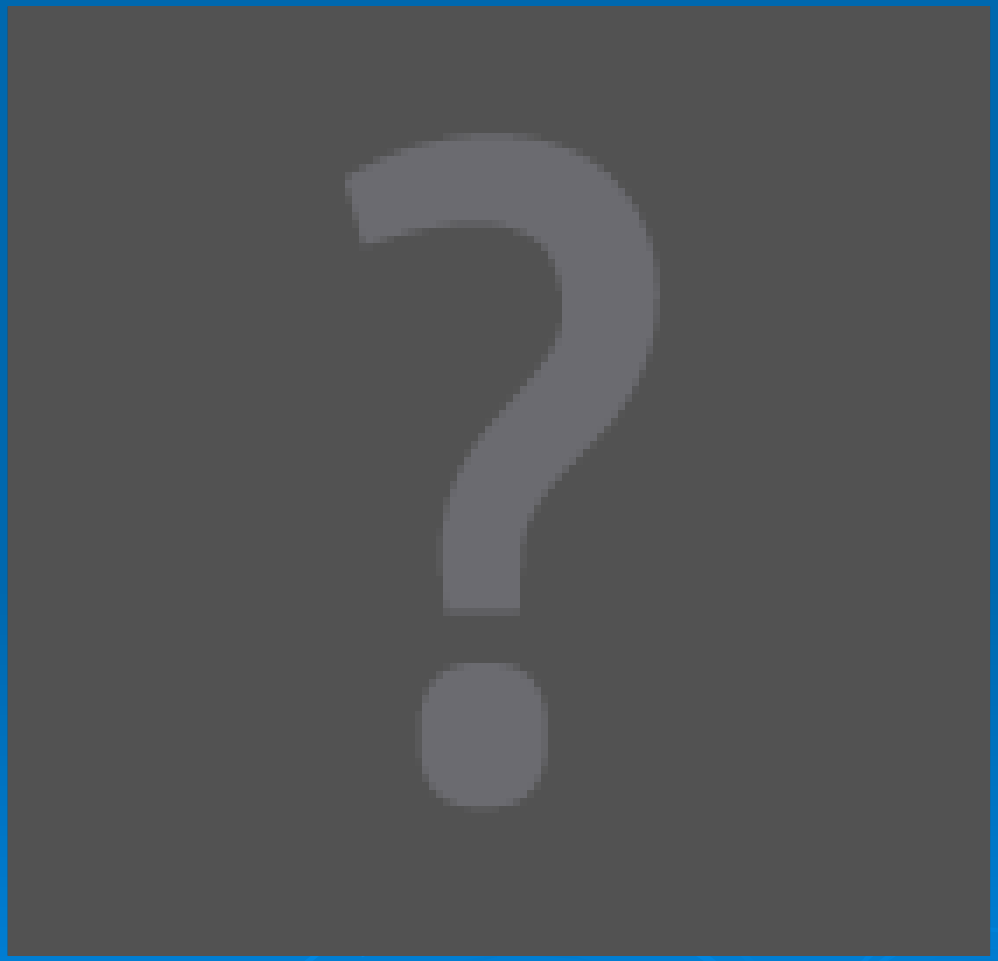
DD:

MVA = 0.6 cm².
Peak/Mean Gr =35\28 mmHg

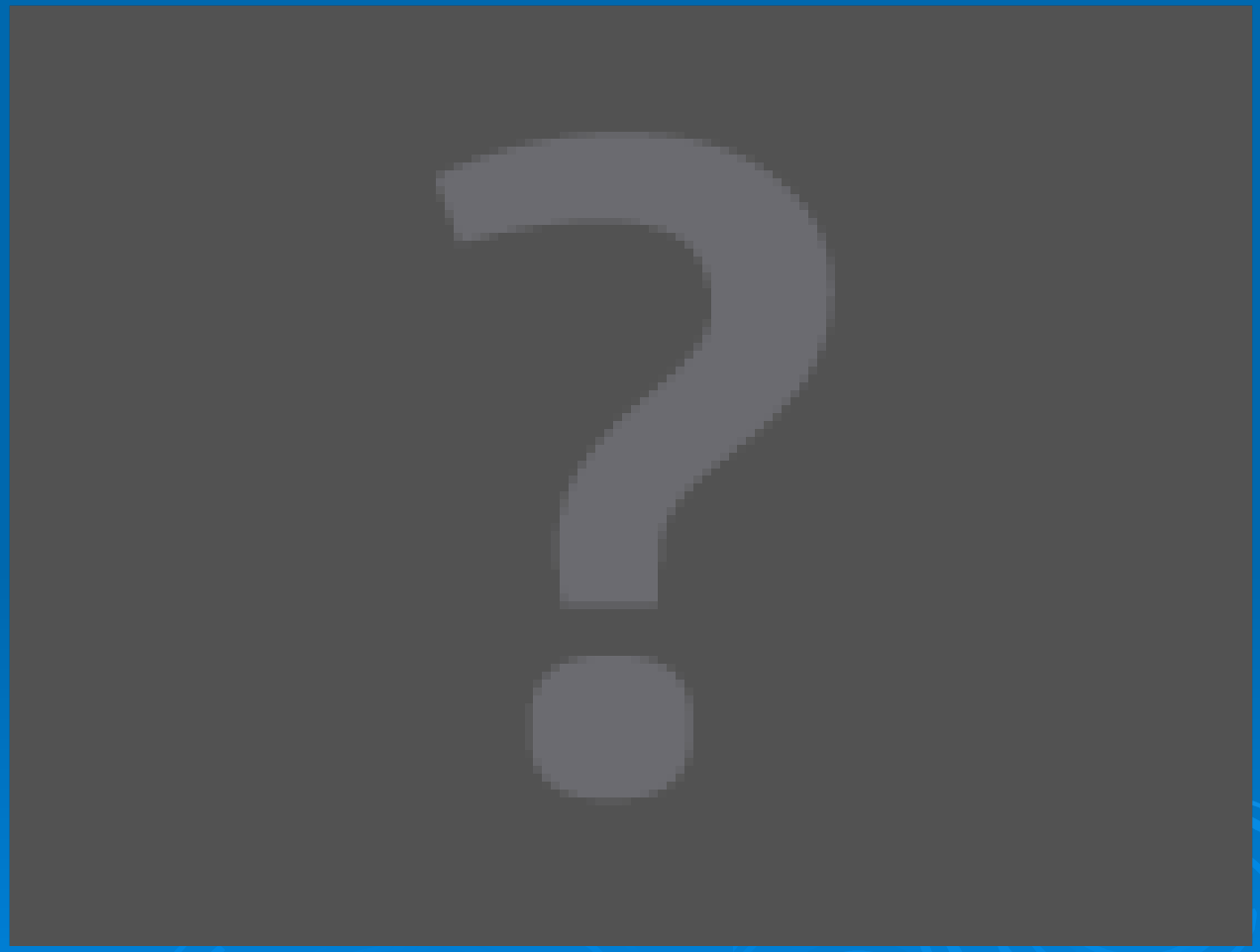
Predictors of Thrombus vs. Pannus

Predictors	Favor thrombus	Favor pannus
Onset of symptoms	Acute	Chronic
Time after surgery	< 1 month	> 6 month
Echo features	Large masses Left atrial extension Low density	Smaller masses No LA extension High density
Adequate coagulation	No	Yes

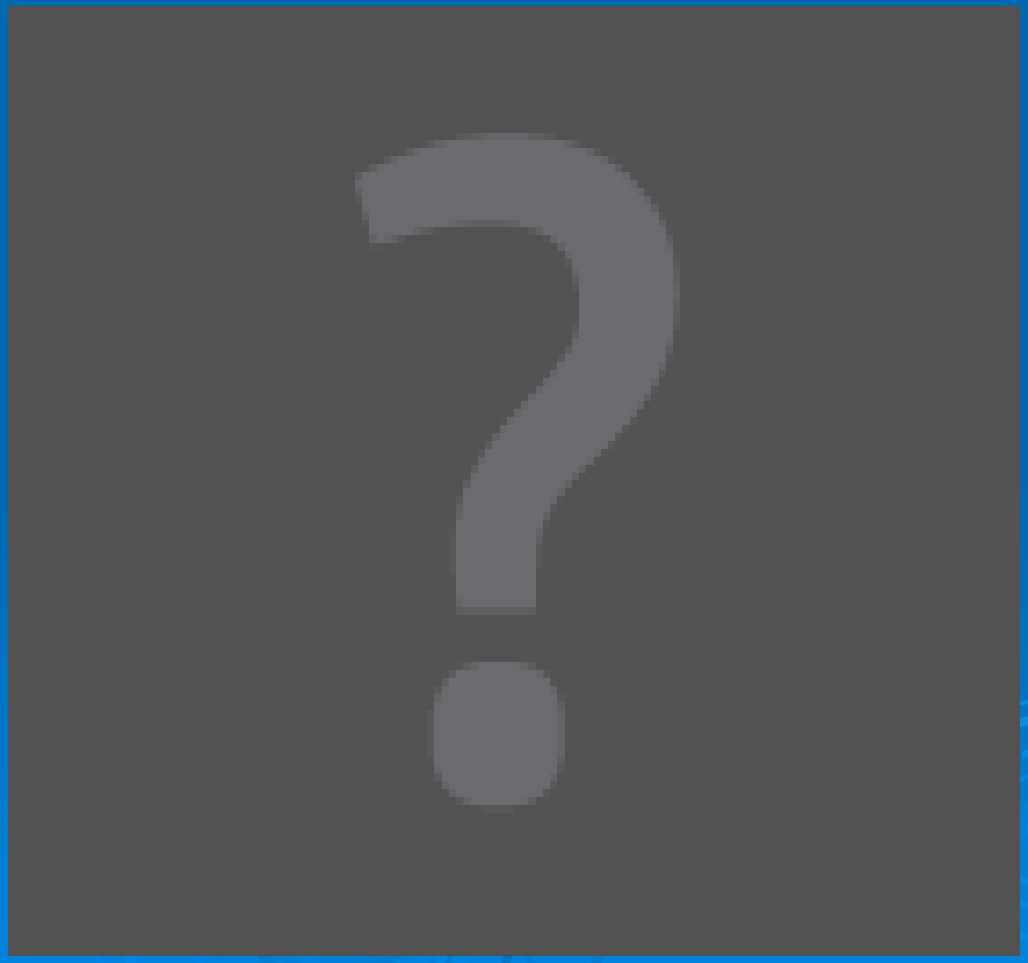
TEE on admission



Fluoroscopy on admission



Fluoroscopy on admission



Stuck prosthetic valve: Therapeutic options

- Surgery
- Thrombolysis
- High intensity AC

Surgery for stuck valve

Surgery although very effective is associate with the following problems:

- Always a re-do surgery
- High complication rate
- High perioperative mortality: 12%-46% (15% in large series)
- Higher morbidity and mortality in those with worse F.C
- Possible future reoperation
  - Biologic valve - degeneration
  - Mechanical valve- re-thrombosis

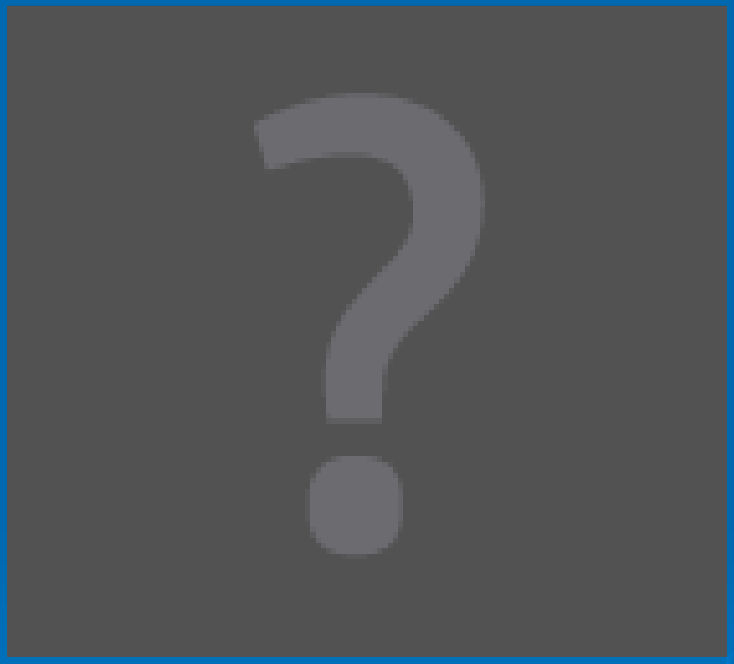
Thrombolytic Therapy

- IV TPA
  - Bolus 10 mg
  - 100 mg continuous drip for 3 hours

TTE - CW Doppler 12 hours after TPA

Pre treatment

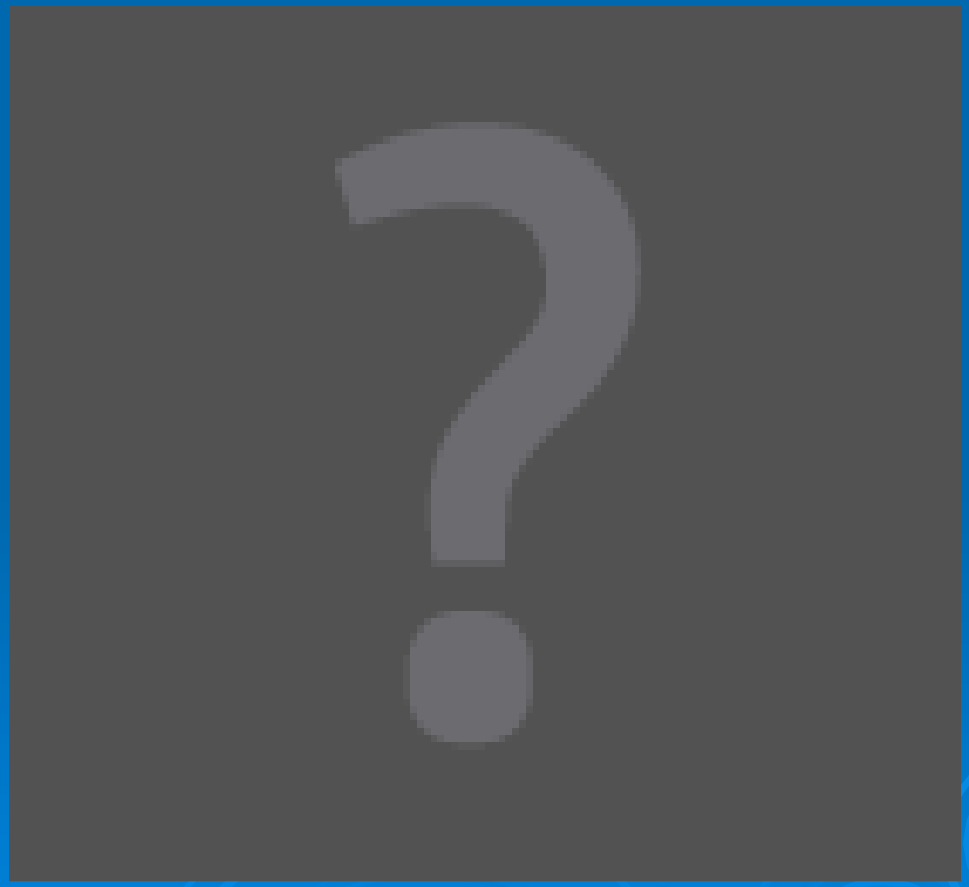
MVA = 0.6 CM^2.
Peak/Mean Gr =35\28 mmHg



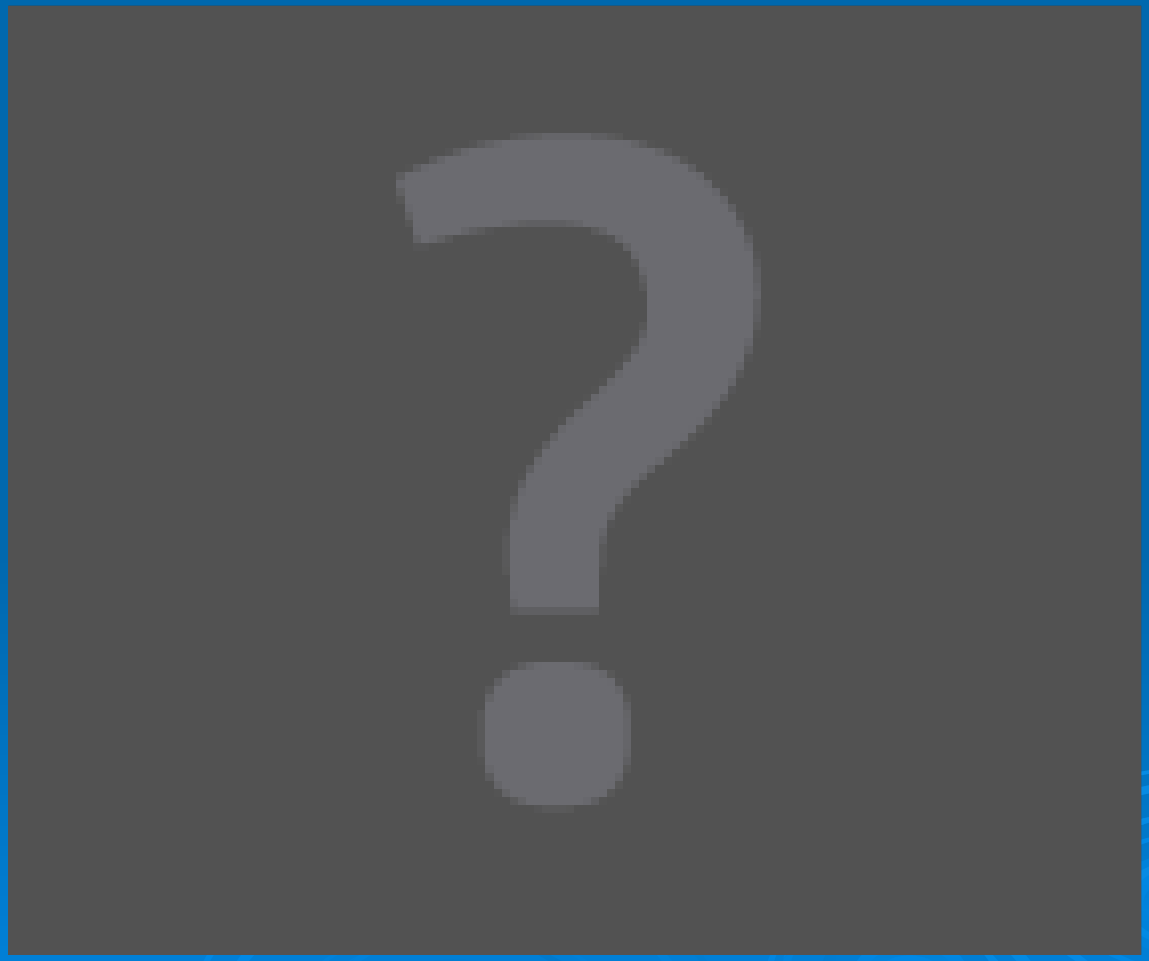
Post treatment

MVA = 2.1 CM^2.
Peak/Mean Gr =12\5 mmHg

TTE - 12 hours after thrombolysis

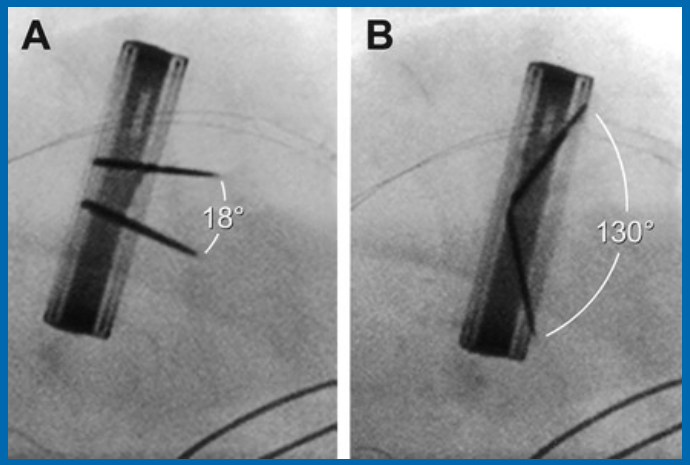


Fluoroscopy after 24 hours



Prosthetic Mitral Valve Thrombosis: Can Fluoroscopy Predict the Efficacy of Thrombolytic Treatment?

- Fluroscopy can predict result of thrombolysis in mitral PVT.
- Hypomobile leaflet always recovers regardless of symptom duration.
- Fully blocked leaflet has a favorable response to thrombolysis only in case of early PVT.
- Late PVT with blocked leaflet does not respond to thrombolysis, suggesting a larger thrombus and the coexistence of pannus



Montorsi et al Circulation 2003

Follow–up

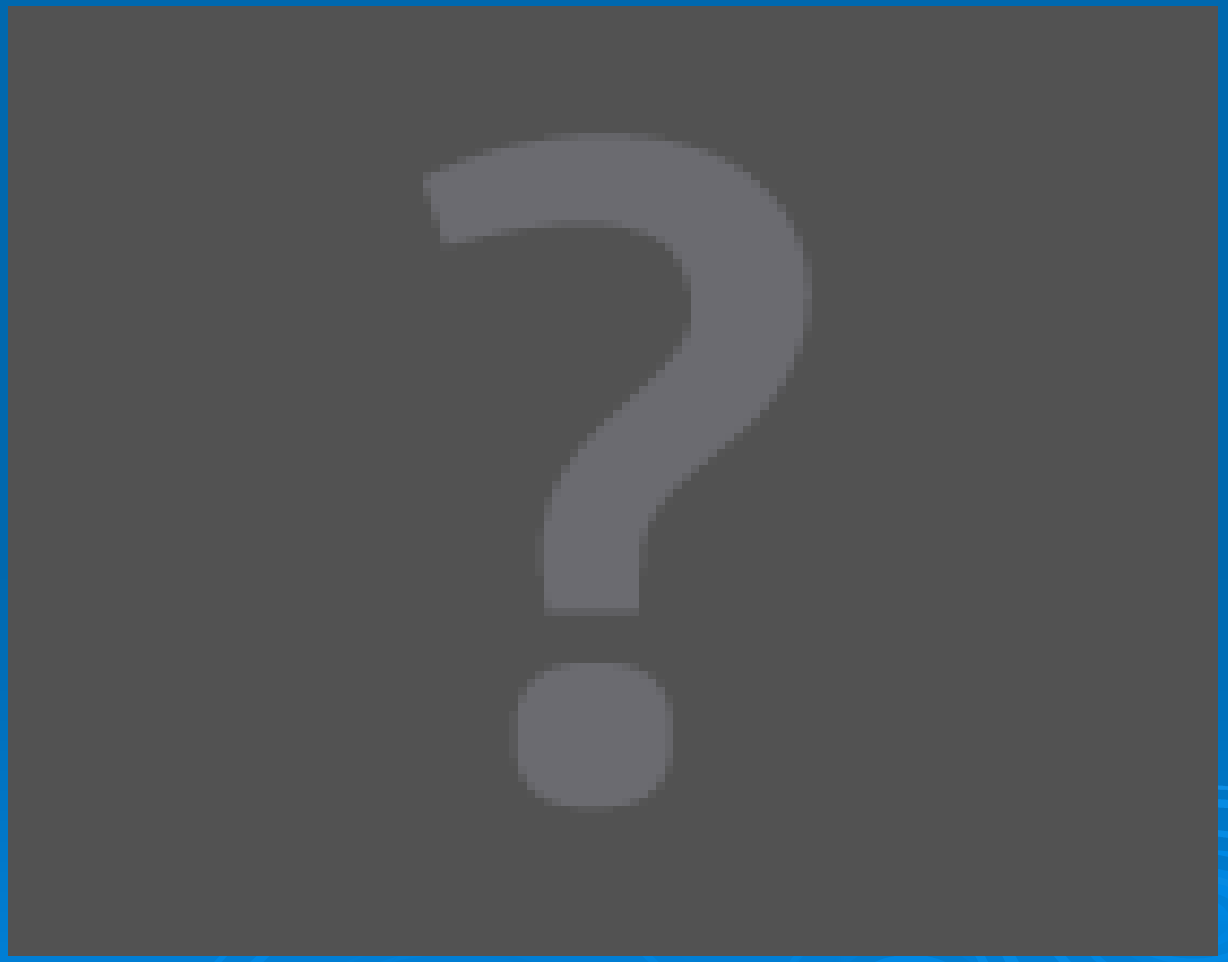
- 10 years later no recurrent episodes of stuck valve on high dose coumadin + aspirin

Thrombolysis for stuck mechanical valve should be the treatment of choice in a high surgical risk patient even in F.C IV.

Case 6

- 43 years – old woman
- S/P MVR – Bileaflet 27m (25 month ago).
- Symptoms – mild dyspnea - FC II-III
- INR –1.8

TEE on admission



Therapy:

- Referred for surgery
- Uneventful postoperative course

AHA/ACC approach to treatment of OPVT

- **CLASS IIa**
- Emergency operation is reasonable for patients with a thrombosed left-sided PV and NYHA functional class III–IV symptoms.
- Emergency operation is reasonable for patients with thrombosed left-sided prosthetic valve and a large clot burden. *(Level of Evidence: C)*

AHA/ACC approach to thrombolytic therapy in OPVT

- Thrombolysis for **right-sided** valves in NYHA class 3-4 or a large thrombus – IIa

- CLASS - IIb
- Indication for thrombolysis of left-sided valves as first line, if either
  - FC 1-2, small thrombus
  - FC 3-4, small thrombus
  - FC 2-4, large thrombus

If surgery is high risk or unavailable

Bonow et al, JACC 2006

ESC approach to treatment of OPVT

CLASS I (level of recommendation C)

- Urgent or emergency valve replacement is the treatment of choice for obstructive thrombosis in critically ill patients without serious co morbidities

Vahanian et al, ESC 2007

ESC approach to thrombolytic therapy (TT) in OPVT

- TT can be considered if
  - Critically ill patients unlike to survive surgery
  - Situation in which surgery is not available and the patient can not transferred
  - Thrombosis of tricuspid or pulmonary valve replacements because of low incidence of embolism

Vahanian et al, ESC 2007

Society of Heart Valve disease approach to TT in OPVT

- TT is the first-line treatment in all patients with OPVT independent of NYHA class if there are no contraindications (Class I)

Lengyel et al, JHVD 2005

Review recommendations For Patients who are critically ill when presenting with PVT

- Patients who are critically ill when presenting with PVT NYHA class III\IV **should receive immediate** IV thrombolytic therapy
- **Repeated infusions** of thrombolytic agents should be administered if complete resolution of prosthetic valve thrombus is not achieved.
- **Re-do valve replacement** should be seriously considered if repeated infusions of thrombolytic agents fail

Ca´ceres-Lo´riga et al 2006, Int J Cardiol

Thrombolysis in Stuck Left-sided Valves Guided by TEE

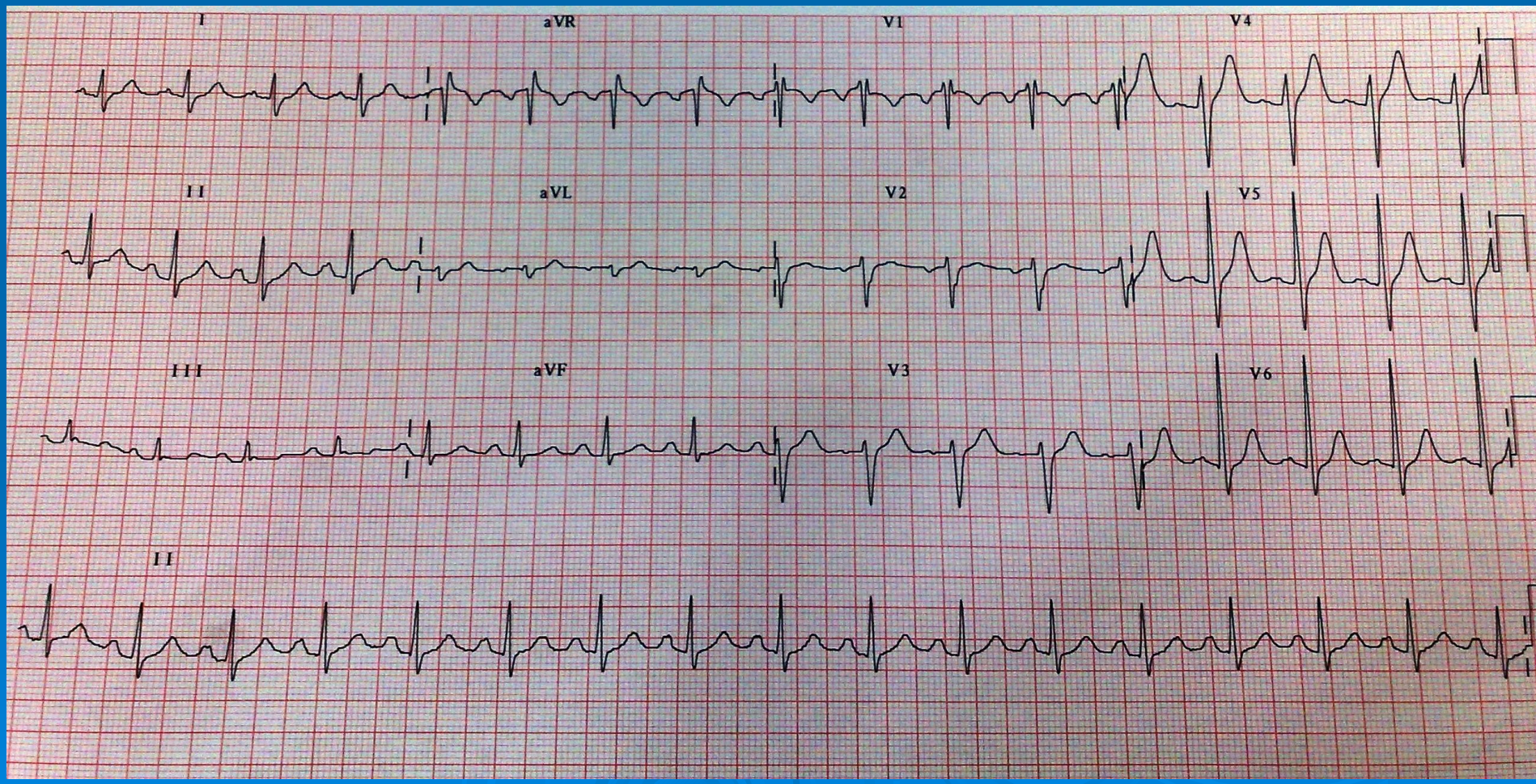
	Shapira and Sagie	Koca et al	Lengyel and Vandur	Tong and Zoghbi	Total
No of episodes	39	29	43	107	203
Successful lysis	82%	81%	86%	87%	84%
Embolism	3%	5%	9%	7%	6%
Death	0%	0%	5%	5.6	2.5%

Case presentation

- A 47 years old man
- 4 years ago an echocardiogram done due to chest pain reveal:
  - MVP with mild MR and normal LV size and function
  - bicuspid aortic valve with mild AR
  - Thallium SPECT – 13 minutes Bruce – normal
- Other diseases
  - Primary myelofibrosis
  - Splenectomy
  - Thrombocytosis- hyderea and aspirin treatment

- 2 weeks before admission several events of effort dyspnea without chest pain.
- On **the day of admission** (Saturday) he presented with **pulmonary edema** after mild effort.
- On examination :BP 170\80 HR: 90 dyspnea, 4/6 systolic murmur, lung congestion. No right heart failure

ECG on presentation



Deferential diagnosis

- After treatment with diuretics, oxygen, Nipride and morphine the patient was stabilized
- DD:
  - 1.
  - 2.
  - 3.

TTE

LVEDD = 57 mm
LVESD = 36 mm

TTE-Doppler Color flow

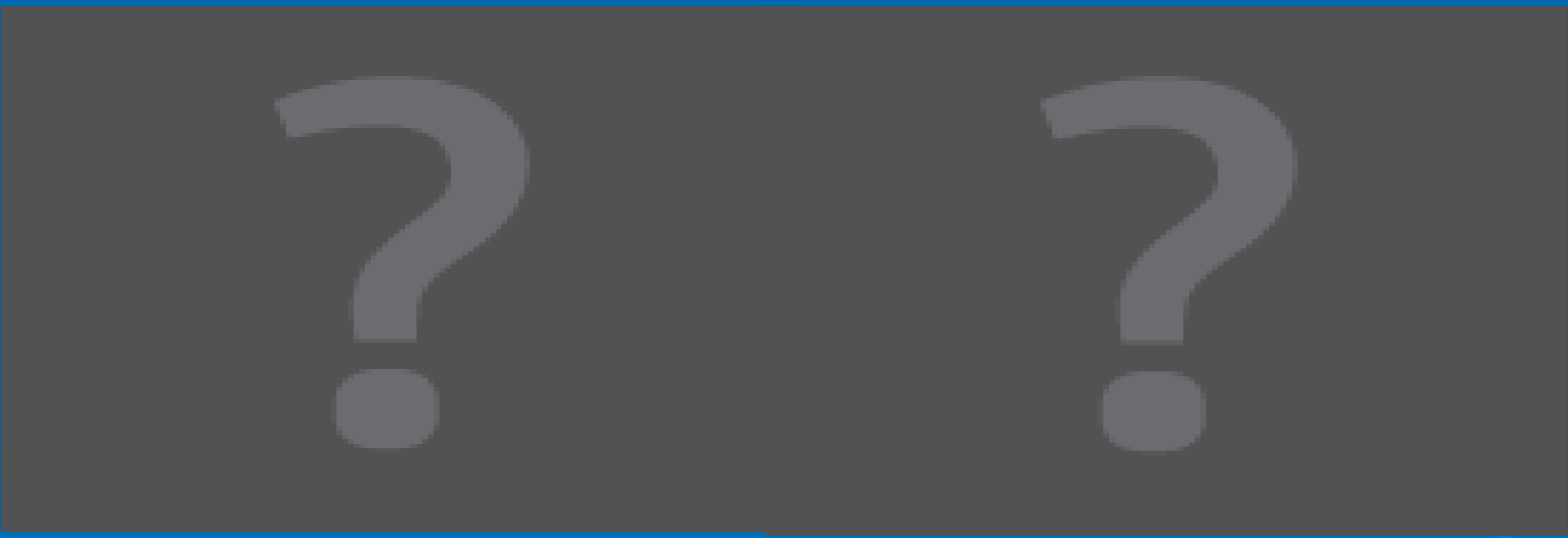
TTE SA

TTE 4CV

TTE 5CV

Doppler TV

TEE



TEE flail anterior leaflet

TEE SA aortic valve

TEE – pulmonary veins

What to do next

- IABP and immediate surgery
- Coronary angio IABP and immediate surgery
- Coronary angio and surgery tomorrow morning
- Conservative (drug therapy) treatment and consider surgery later on according to his functional status and LV size and functioon

Coronary angio

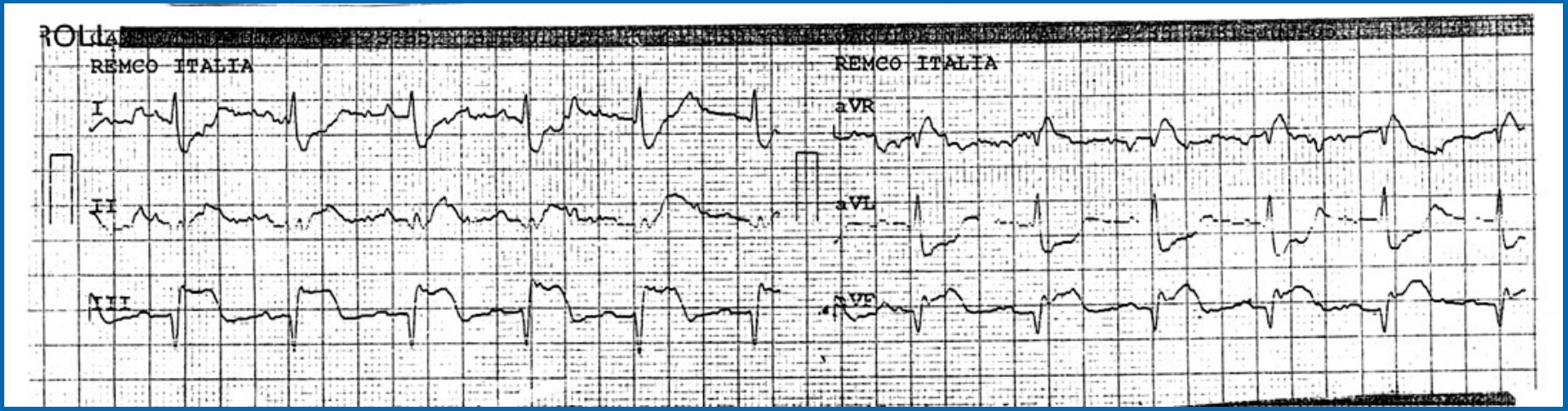
TTE post repair

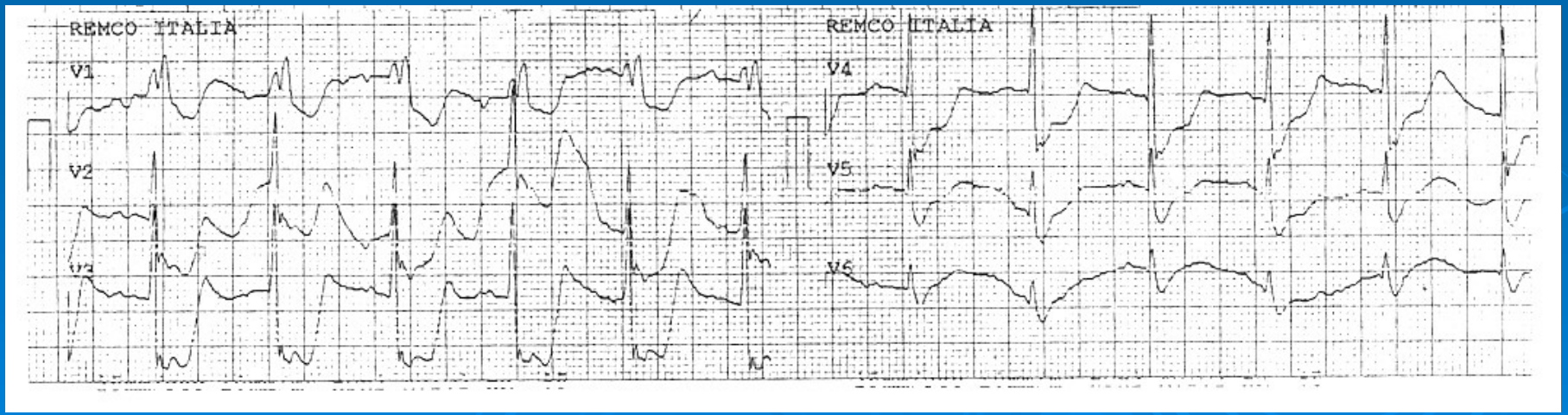
TTE -4CV post repair

Cardiogenic shock in a patient with acute inferior wall MI

- A 78 years old man was admitted at midnight to emergency room with typical chest pain starting 12 hours before.
- In the ICCU - Systolic BP 85 mmHg – no pulmonary edema, no murmurs
- ECG shows:
- **DD:**

ECG


REMCO ITALIA
I
II
III
REMCO ITALIA
aVR
aVL
aVF


REMCO ITALIA
V1
V2
V3
REMCO ITALIA
V4
V5
V6

- Short and technically suboptimal echocardiogram revealed good global LV function and significant RV dysfunction
- Cardiogenic shock due to significant RV involvement was diagnosed
- Patient was transferred urgently to cath lab for primary PCI.

Cardiac Catheterization

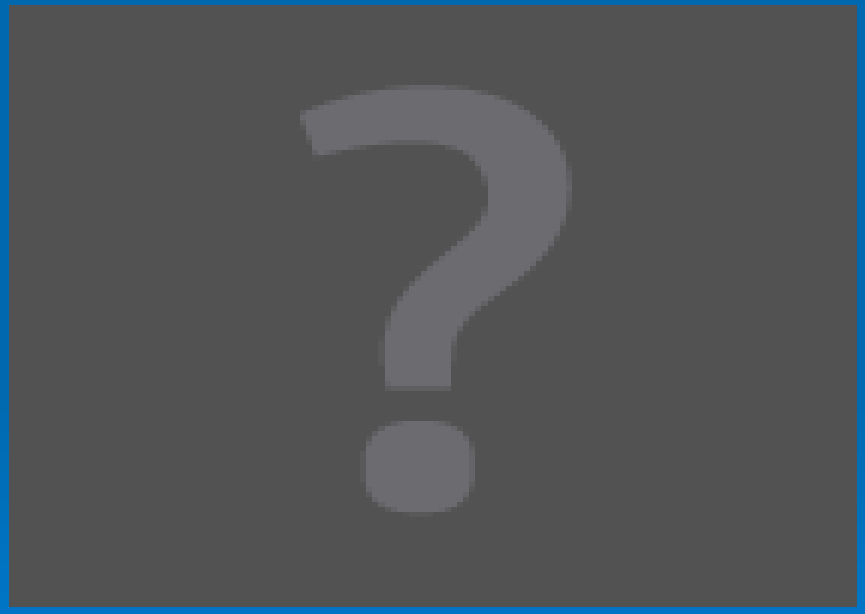
PCI

Follow-up

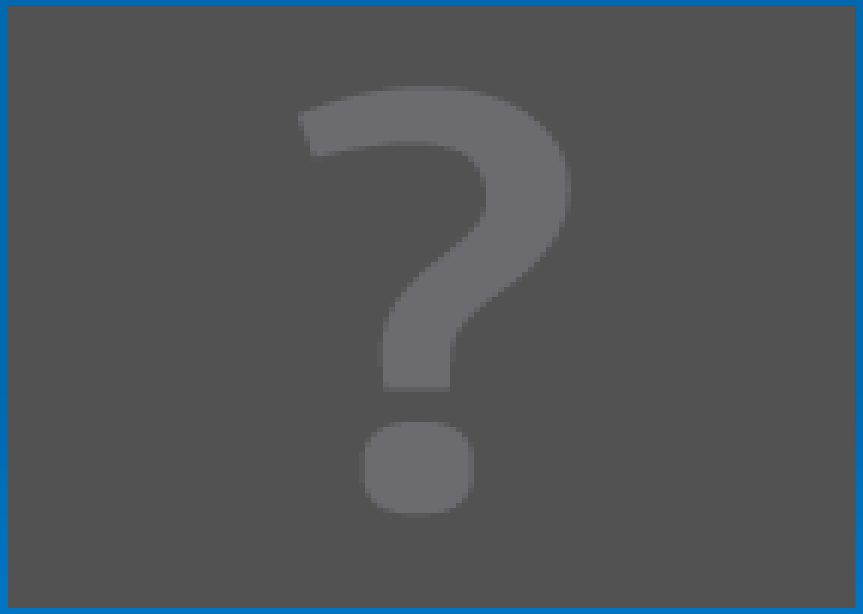
- After stenting the RCA the patient remains in cardiogenic shock, ventilated and treated with fluids and aortic balloon pump.
- RV infarction was the leading diagnosis.
- Next morning the patient deteriorates with pulmonary edema and TTE was done

TTE

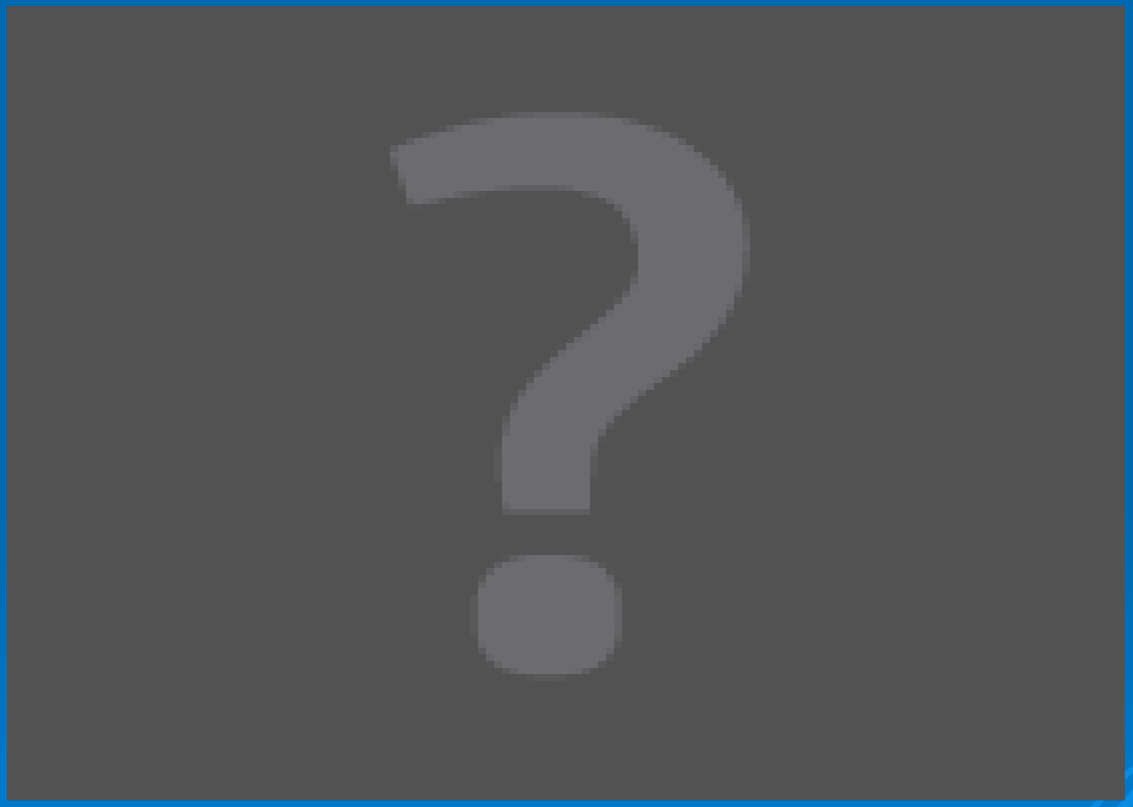
TTE-Color Doppler



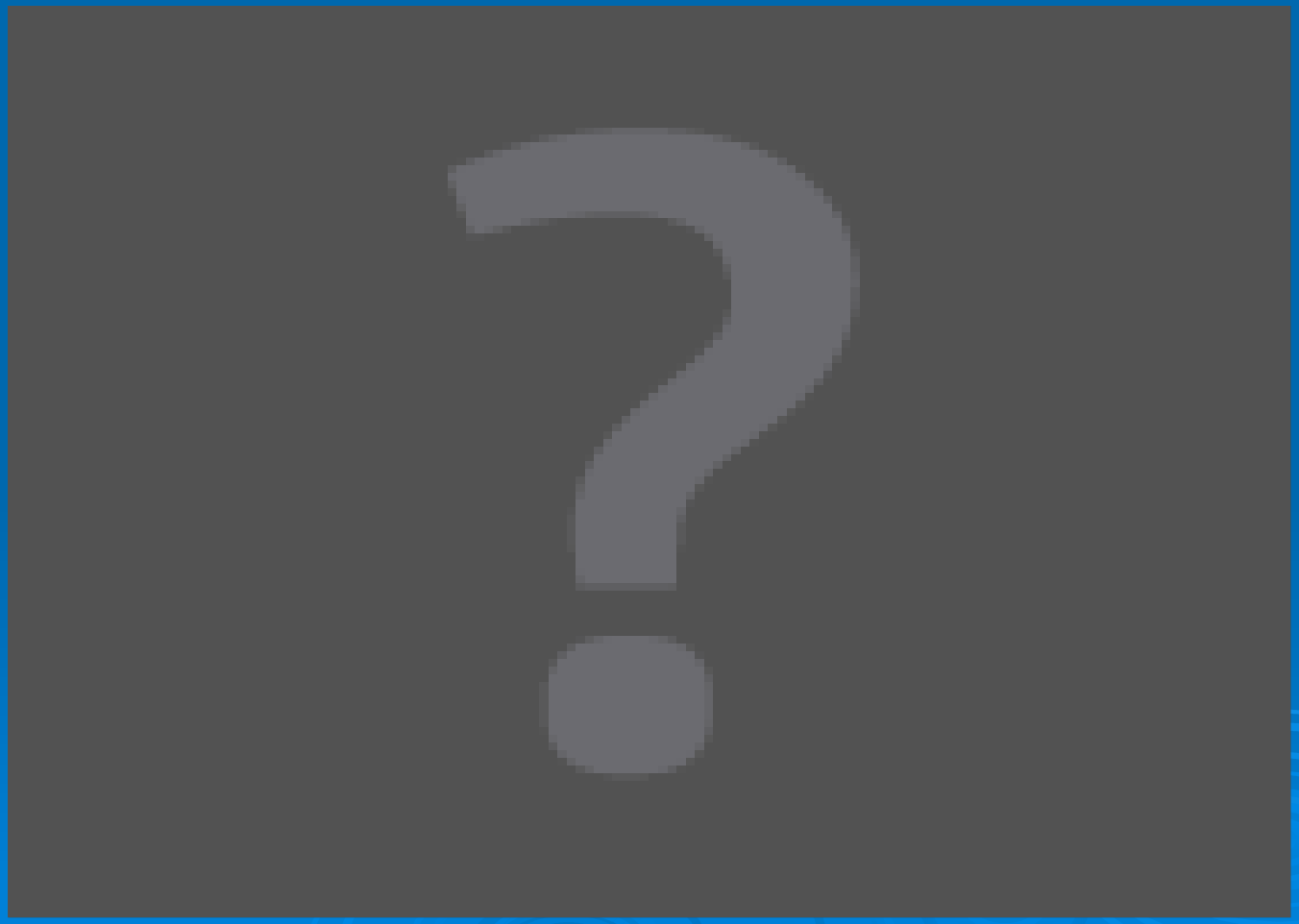
Intraoperative TEE



Papillary Muscle Rupture



Pulmonary Venous Flow



Follow -up

- MVR +CABG of RCA was peformed.
- Although initially he was hemodynamically stable, he died few days later from sepsis.

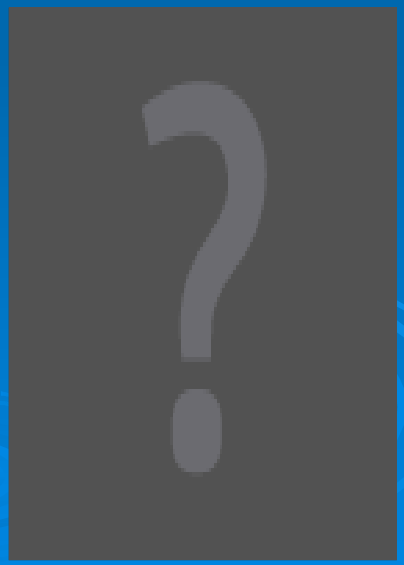
Lessons

- Unusual presentation of acute papillary muscle rupture (pulmonary edema was not the predominant presenting symptom).
- Maybe the combination of PMR with significant RV dysfunction (low cardiac output) contributed to the atypical clinical presentation.
- Early **complete** echocardiographic study is essential in every complicated AMI before primary PCI

Pulmonary edema in a patient with biologic mitral prosthesis

- A 63 yrs old men was admitted to the ICCU with worsening shortness of breath.
- A year ago he underwent CABG + MVR for severe ischemic mitral regurgitation (biological prosthesis).
- He was well until 2 weeks before hospitalization and than noted worsening shortness of breath. There was **no fever**
- Congestive heart failure was diagnosed and treated medically. He was stabilized without respiratory support
- TTE was performed

TTE-mitral xenograft stenosis

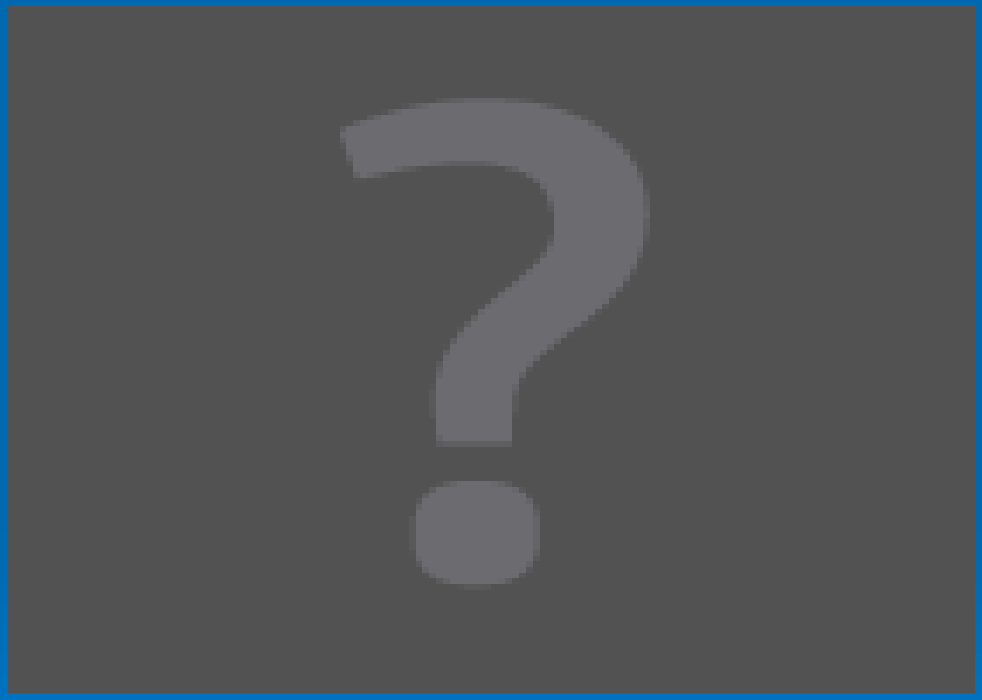


MVA = 0.7 CM^2.
Peak/Mean Gr =50\30 mmHg

TR – Severe PHT

Pulmonary artery pressure around 70-80 mmHg

TEE



MVA = 0.7 CMsq.
Peak/Mean Gr =50\30 mmHg

TEE
Prosthesis ring

- DD:
  - Thrombus
  - Pannus
  - Vegetations
  - Degeneration

Bioprosthesis obstruction due to large vegetations mass was the leading diagnosis

Follow-up

- Coronary angiography was advised before operation.
- During cath the patient developed PE and mechanical ventilation was needed.
- All grafts were patent.
- High temprature was noted.
- Surgery was scheduled for the next morning.
- Several hours later the patient **deteriorated into cardiogenic shock** and was transferred urgently to OR.
- Re-MVR was performed and the patient recovered uneventfully.

Follow-up

- At surgery the valve was filled with vegetations that blocked the valve almost completely.
- Cultures from the prosthetic valve revealed S.auerous

Lesson

- Biological valve stenosis (“stuck”) is a true emergency situation (like stuck mechanical valve) and needs emergent intervention.
- In this case TEE contributed significantly to diagnosis

Thanks for listening