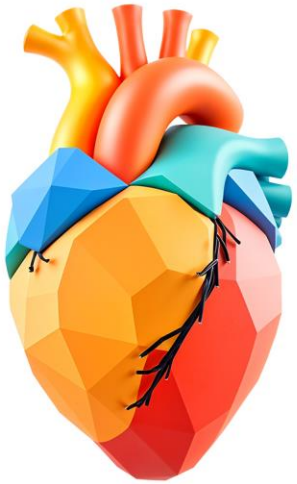

مرکز قلب تهران

دانشگاه علوم پزشکی و خدمات بهداشتی درمانی تهران

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12th Annual Tehran Heart Center Congress

7th CRITICAL CARDIOVASCULAR CARE

دوازدهمین کنگره سالیانه مرکز قلب تهران

2025

۲۵ و ۲۶ بهمن ماه ۱۴۰۳

13 & 14 February

Tehran Heart Center

Tehran, Iran

Prosthetic valve malfunction a case based approach to effective treatment

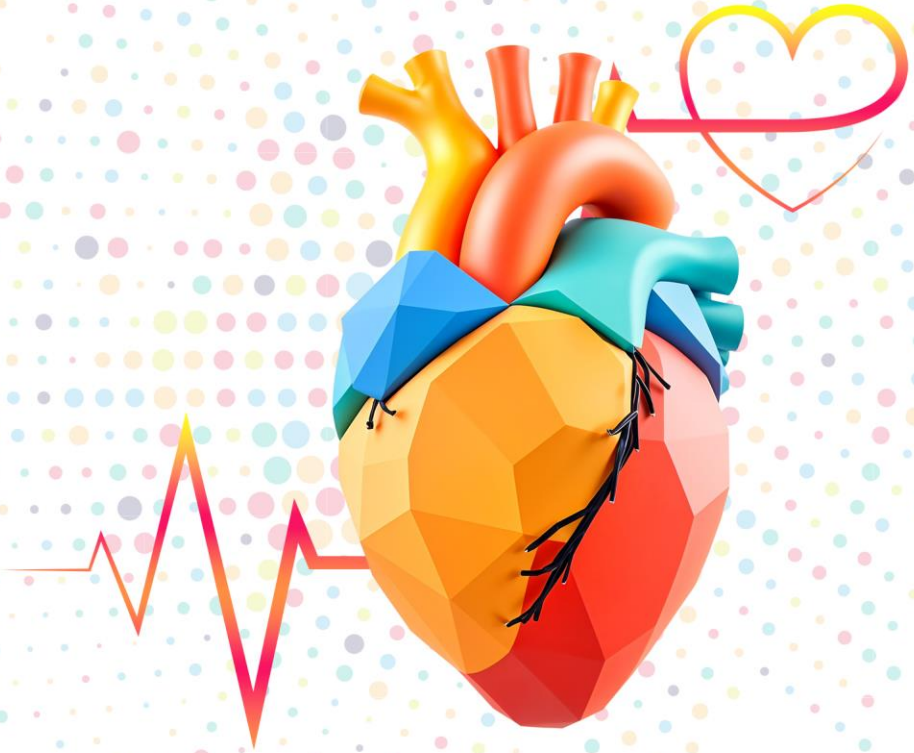
Reza Mohseni Badalabadi

Associated professor of Tehran heart center

مرکز قلب تهران

دانشگاه علوم پزشکی و خدمات
بهداشتی درمانی تهران

Critical Cardiovascular Care



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1950

- first prosthetic ball valve implanted (by Charles Hufnagel) (1952)
- development of circulatory support heart bypass machinery (1953)

1960

- first valve implanted in anatomic position - Starr-Edwards (1960)
- homograft valve in aortic position (Gunning & Duran) (1962)
- stent-mounted porcine valve (Gunning & Duran) (1964)
- tilting disk valve – Bjork-Shiley (1967)
- glutaraldehyde fixation introduced (Carpentier) (1968)

1970

- first valve with pyrolitic carbon implanted (1969)
- first pericardial valve (Ionescu) (1971)
- cryo-presevation introduced (1975)

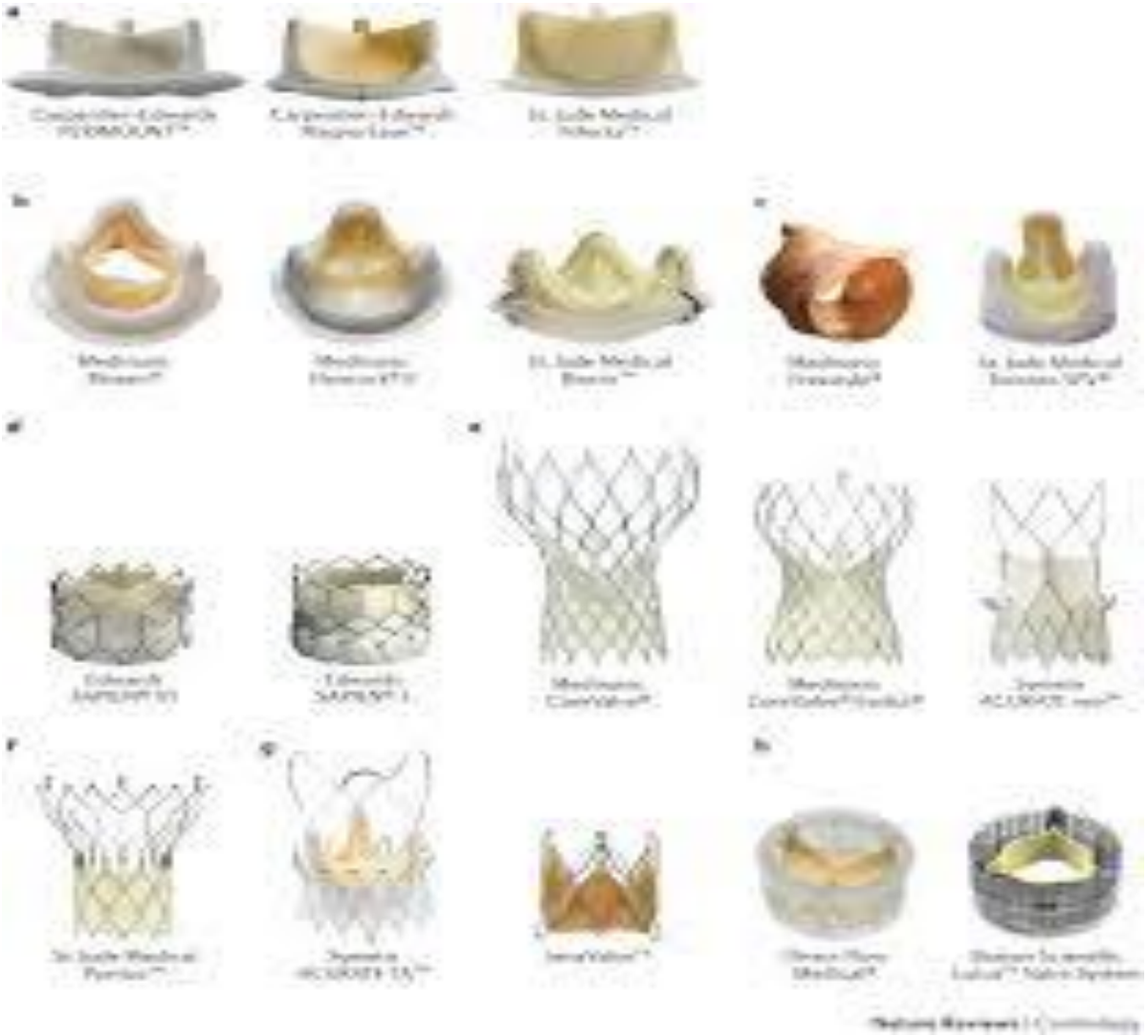
1980

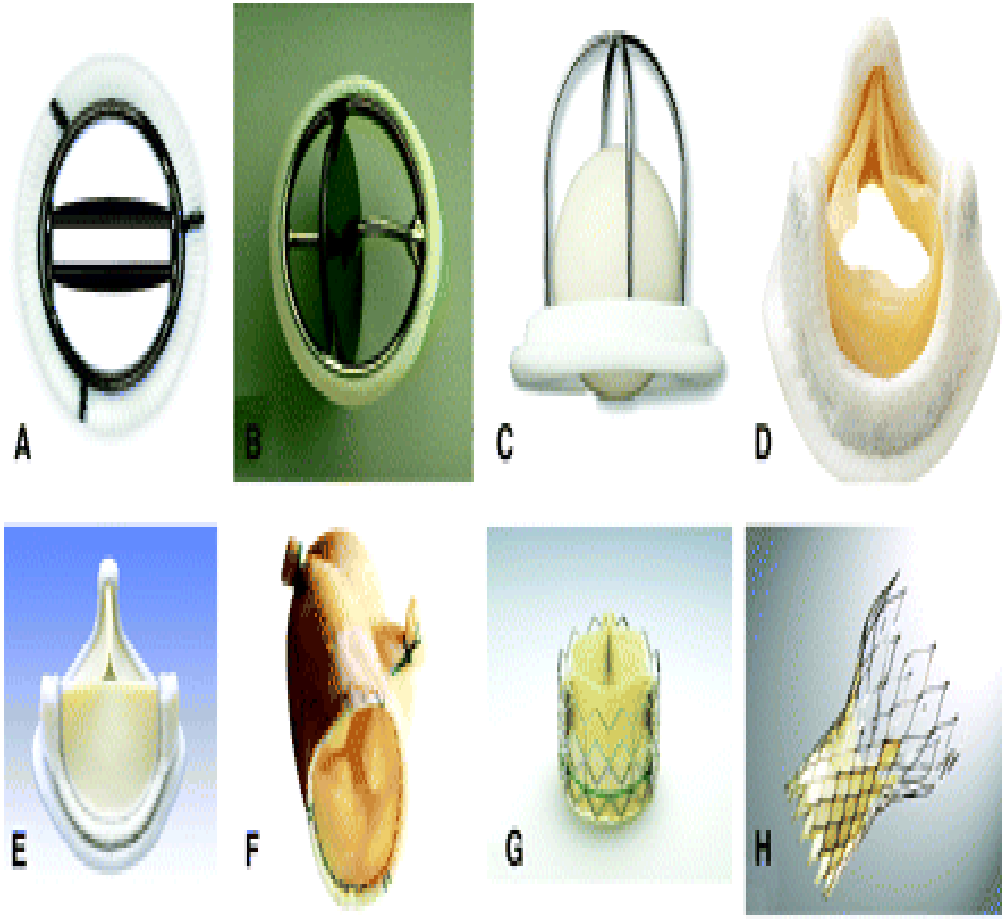
- mechanical bileaflet valve – St Jude Medical (1978)

1990

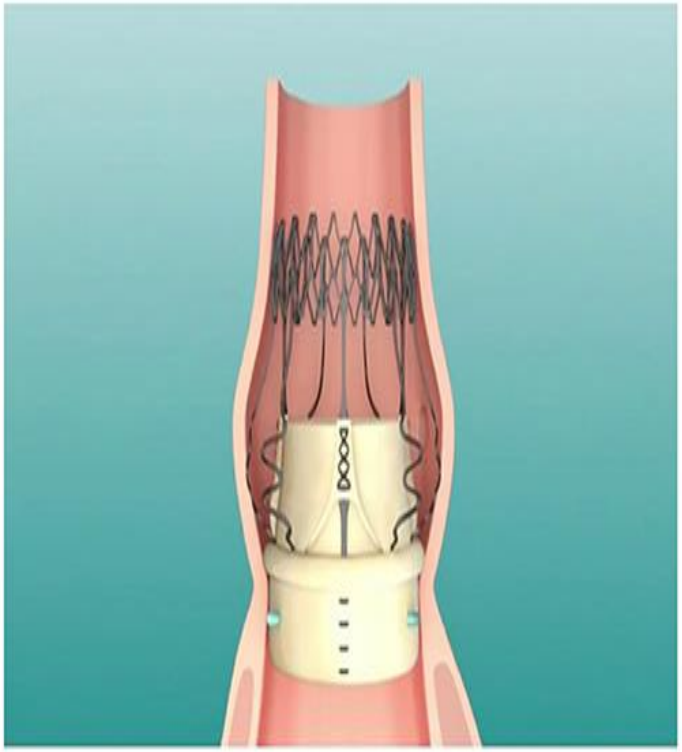
optimisation of designs, materials and surgical techniques

2000




A
B
C
D
E
F
G
H

Perceval suture less valve



Edwards Intuity Elite Valve suture less

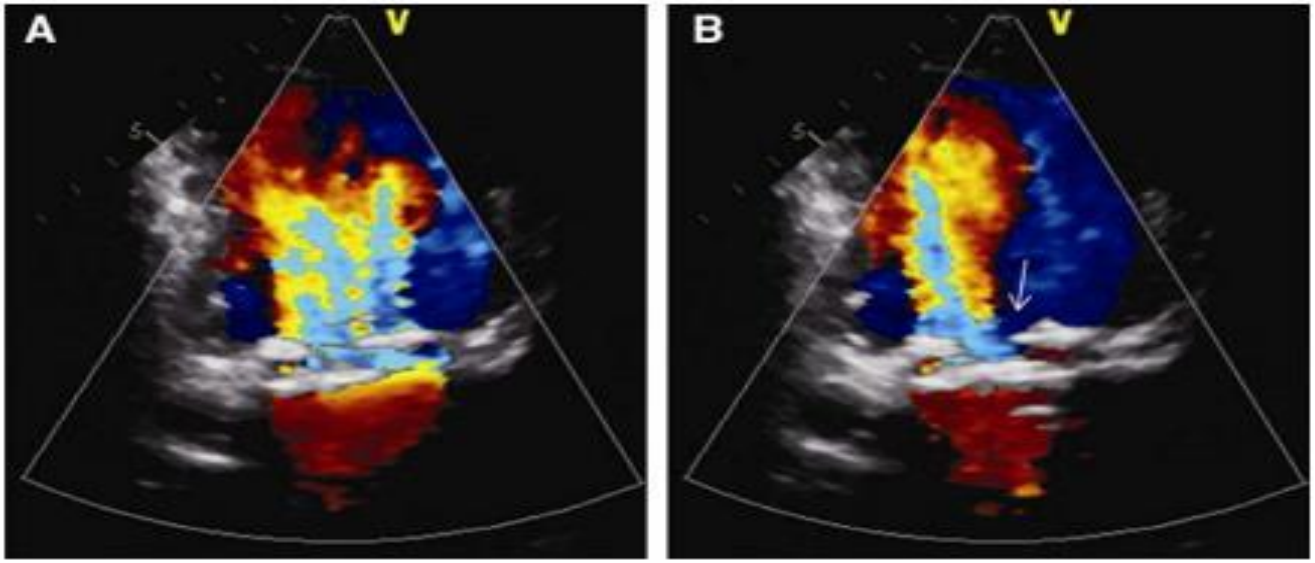
Future of prosthetic valve

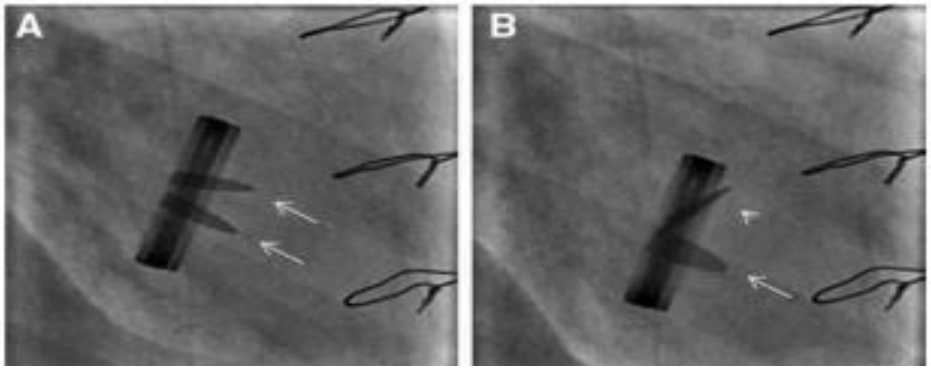
- Biocompatibility
- Durability
- thrombogenicity

PROSTHETIC ECHO REPORT

- Type of prosthetic valve
- Size of prosthetic valve specially bioprosthetic valve
- Date of surgery
- Heart rate and BP
- HB of patient
- Serial echo/HREAT TEAM

Intermittent Malfunction of a Prosthetic Valve


A
V
B
V


A
B

- In operating room
- After operation in follow up
- Management is similar to prosthetic valve dysfunction

- This is a rare case of a non-fully plicated native leaflet having marginal contact with the occluders causing intermittent obstruction.
- Sub-valvular apparatus preservation with posterior leaflet and chordal attachments preservation during mitral valve replacement is a well-established surgical technique presented more than 40 years ago and maintains left ventricular function resulting in survival improvement.
- **Transoesophageal echocardiography is crucial for imaging of prosthetic valves in mitral position.**
- **Dynamic imaging is the key.**

What are possible aetiologies of intermittent proshetic valve dysfunction?

1. Thrombus
2. Pannus
3. Vegetation
4. Subvalvular tissue protrusion
5. All of the above

Highlights

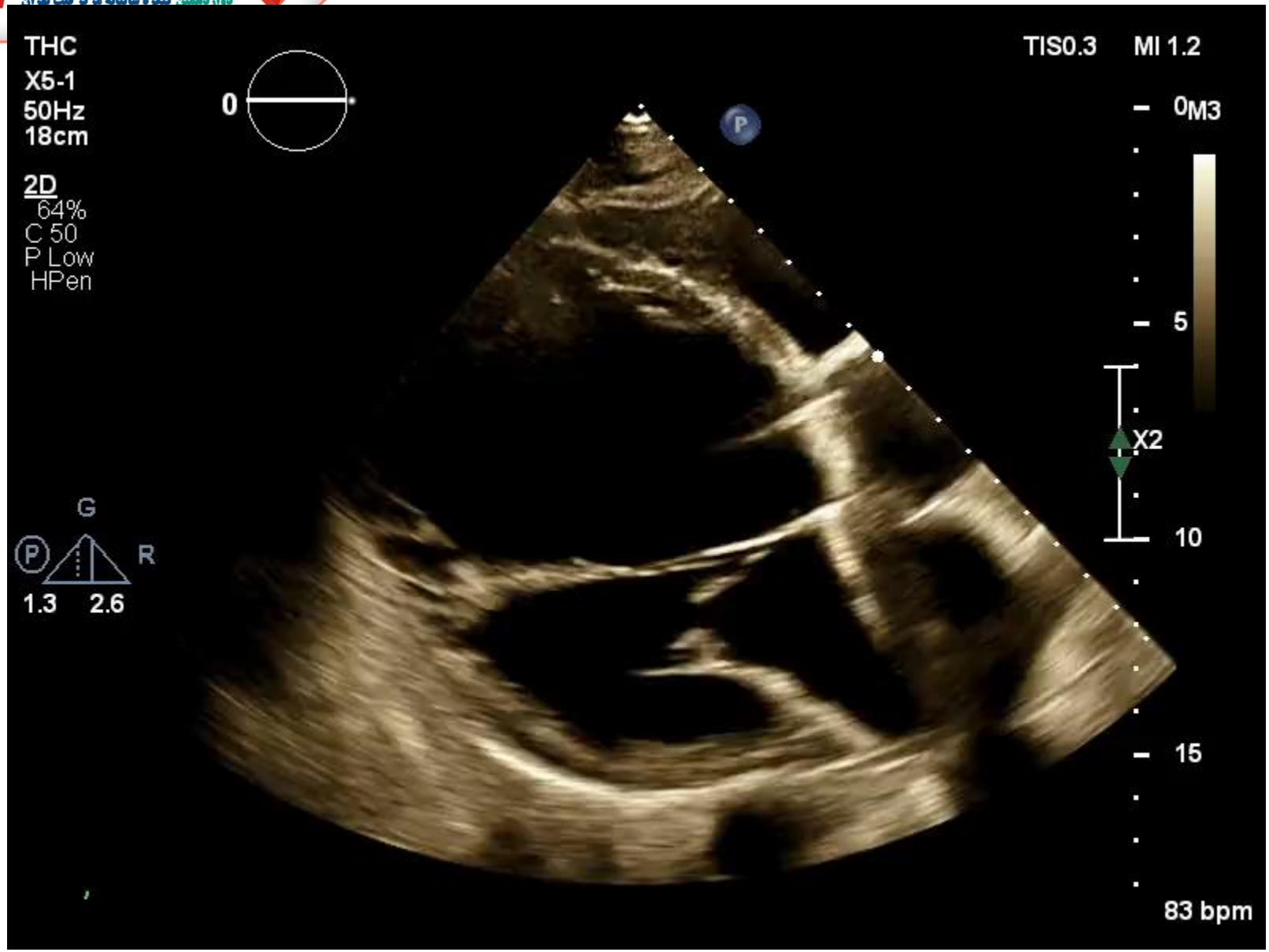
•This study aimed to describe the clinical features and etiologic causes of patients with intermittent mechanical valve dysfunction.

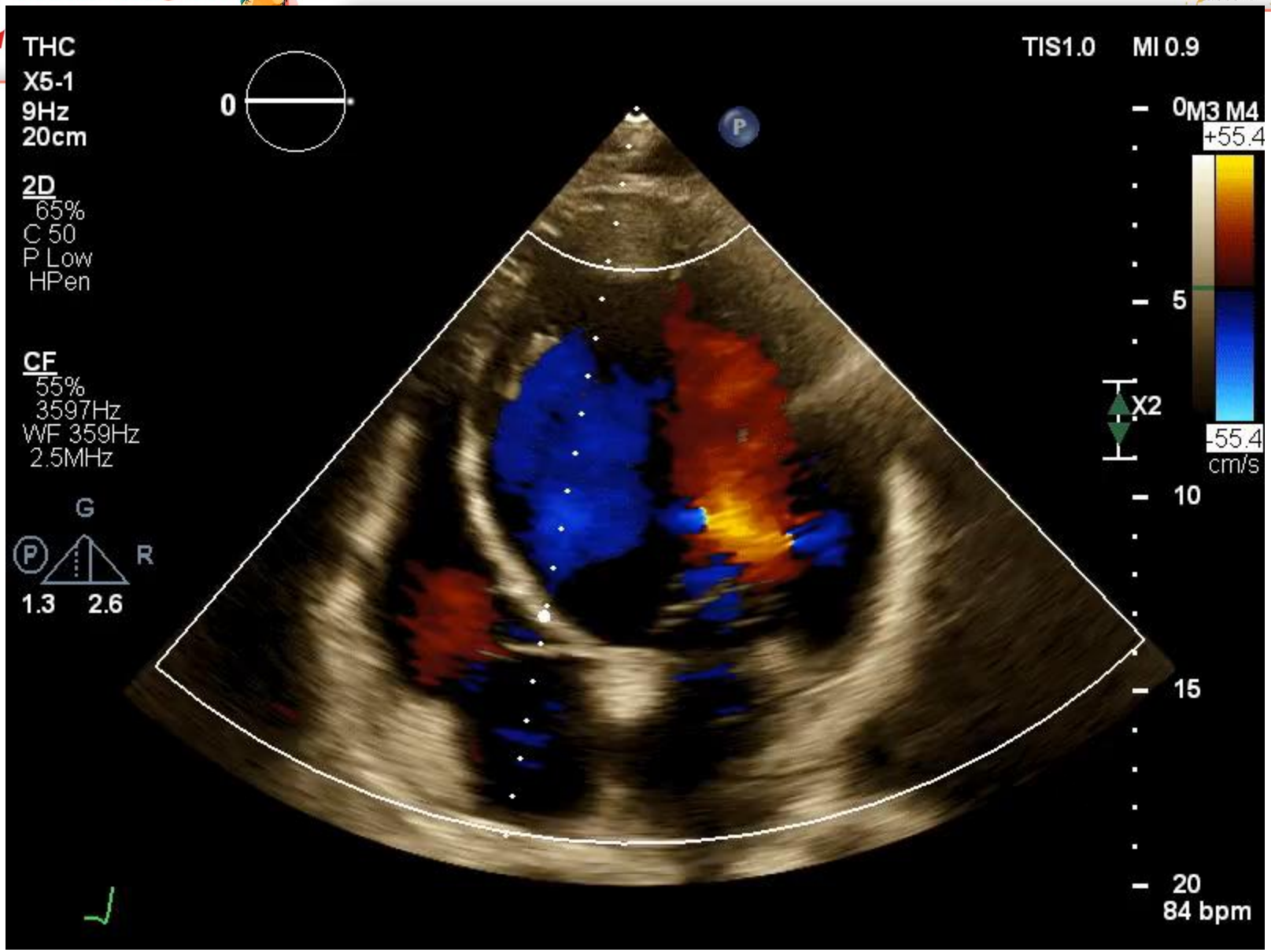
•Intermittent malfunction is a rare but potentially severe complication of the prosthetic heart valve.

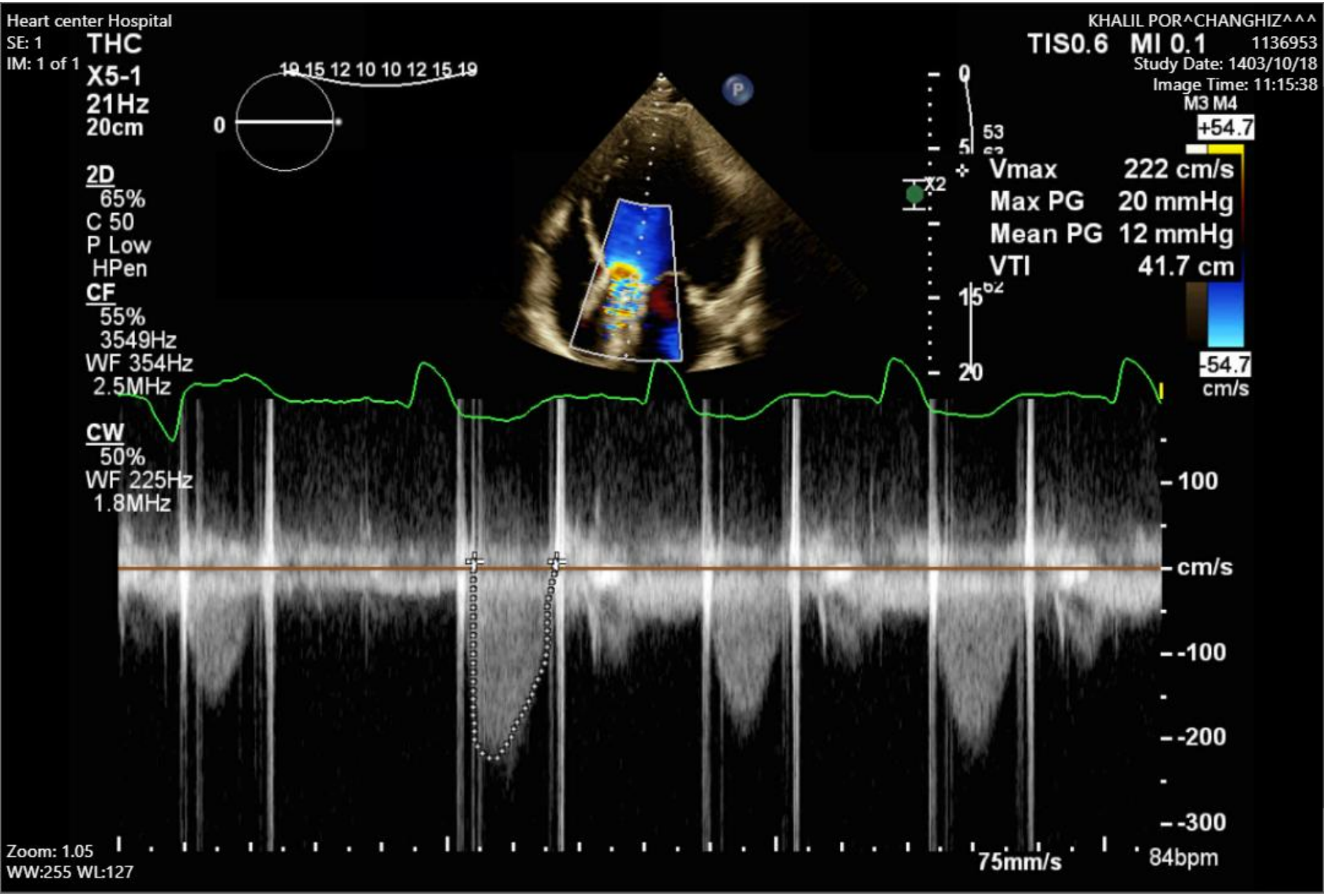
•It requires elaborative examination in symptomatic patients, and transesophageal echocardiography is crucial for differential diagnosis.

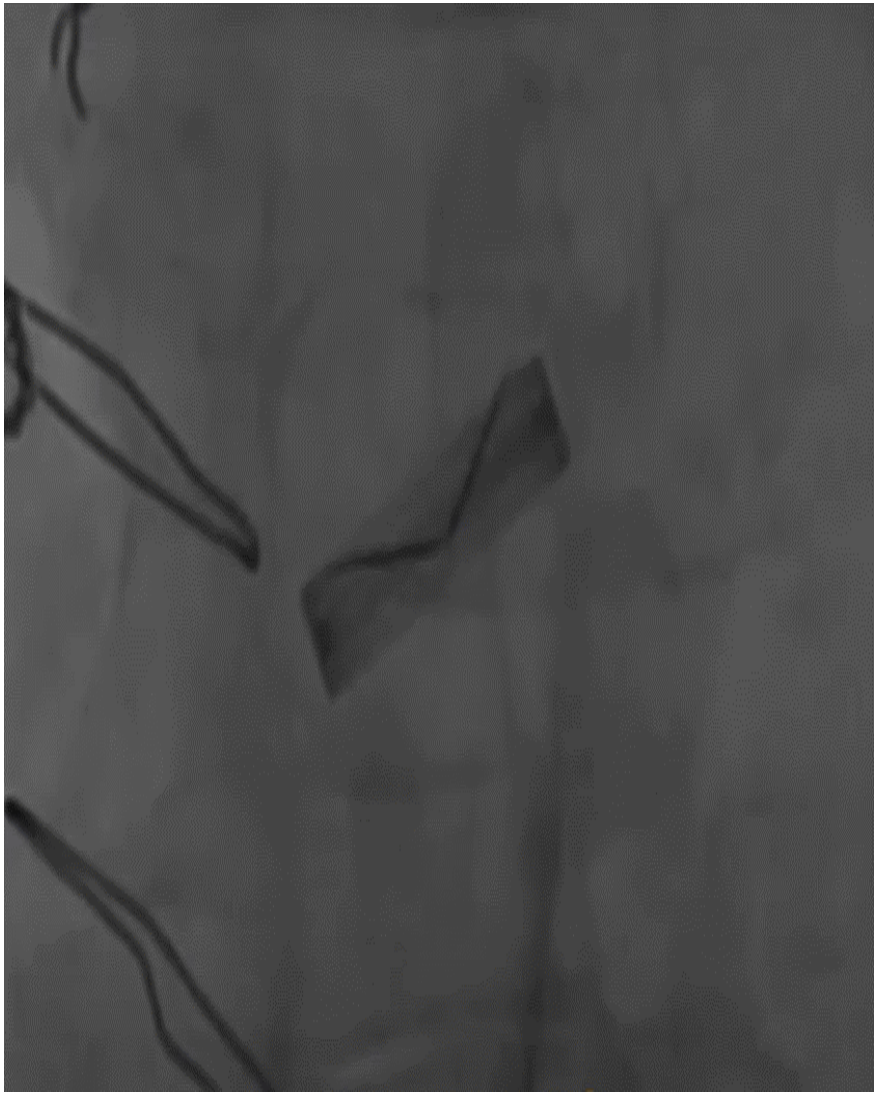
•The frequency of entrapment and the degree of regurgitation or stenosis play a fundamental role in making treatment decisions.

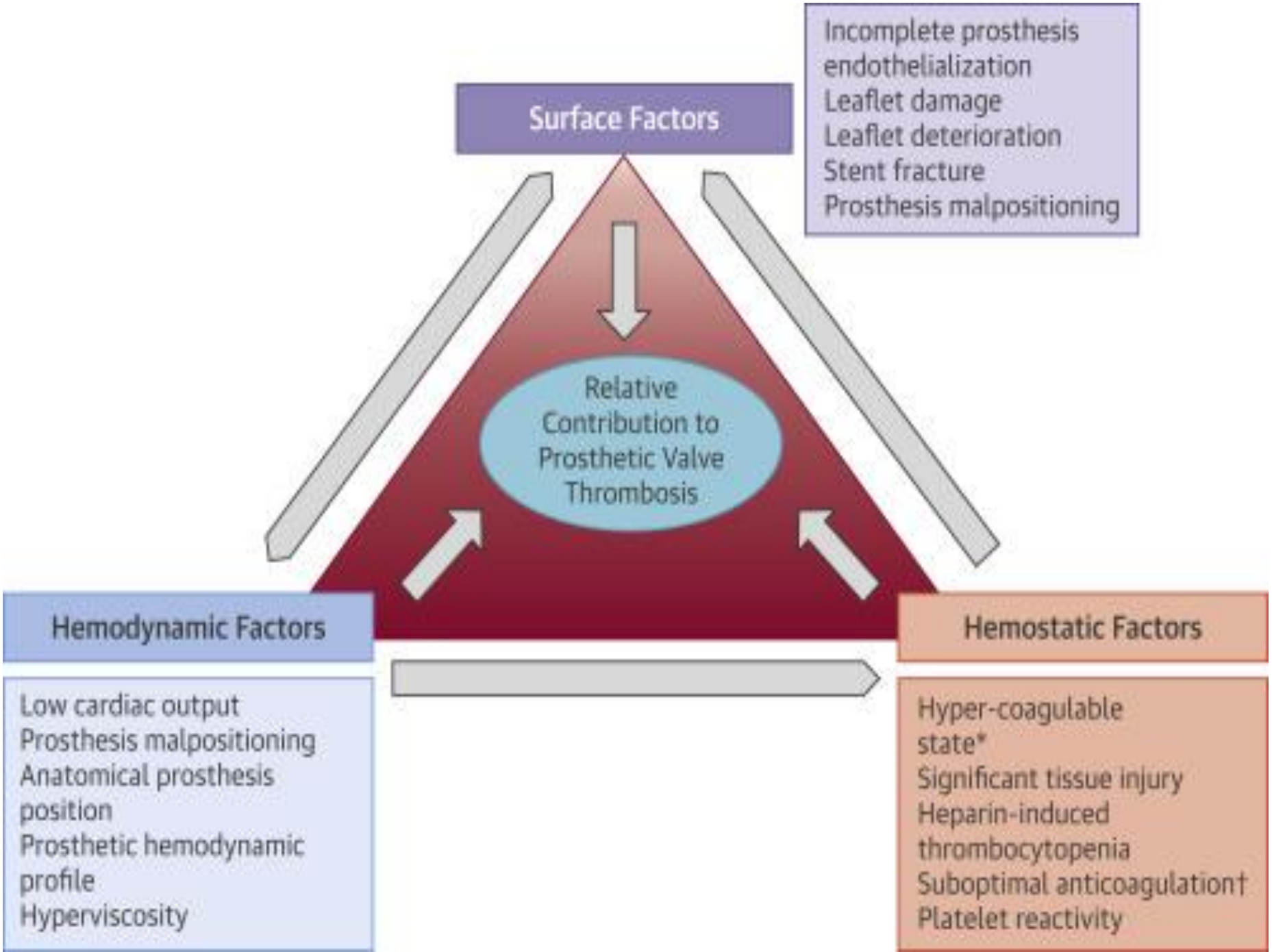
- A45 years old man with hx of AVR (SJ#25)and DOE FCII-III
- PROSTHETIC AV MG=12 PG mmHG =20 AT =80ms
- DVI=0.30 EF=10-15%
- ECHO 6 months before: MG=5mmhg PG=9 mmhg
- INR=1.5


THC
X5-1
50Hz
18cm
2D
64%
C 50
P Low
HPen
TIS0.3
MI 1.2
M3
5
X2
10
15
83 bpm
G
R
1.3
2.6


THC
X5-1
9Hz
20cm
2D
65%
C 50
P Low
HPen
CF
55%
3597Hz
WF 359Hz
2.5MHz
G
P
R
1.3
2.6
TIS1.0
MI 0.9
M3 M4
+55.4
-55.4
cm/s
X2
0
5
10
15
20
84 bpm

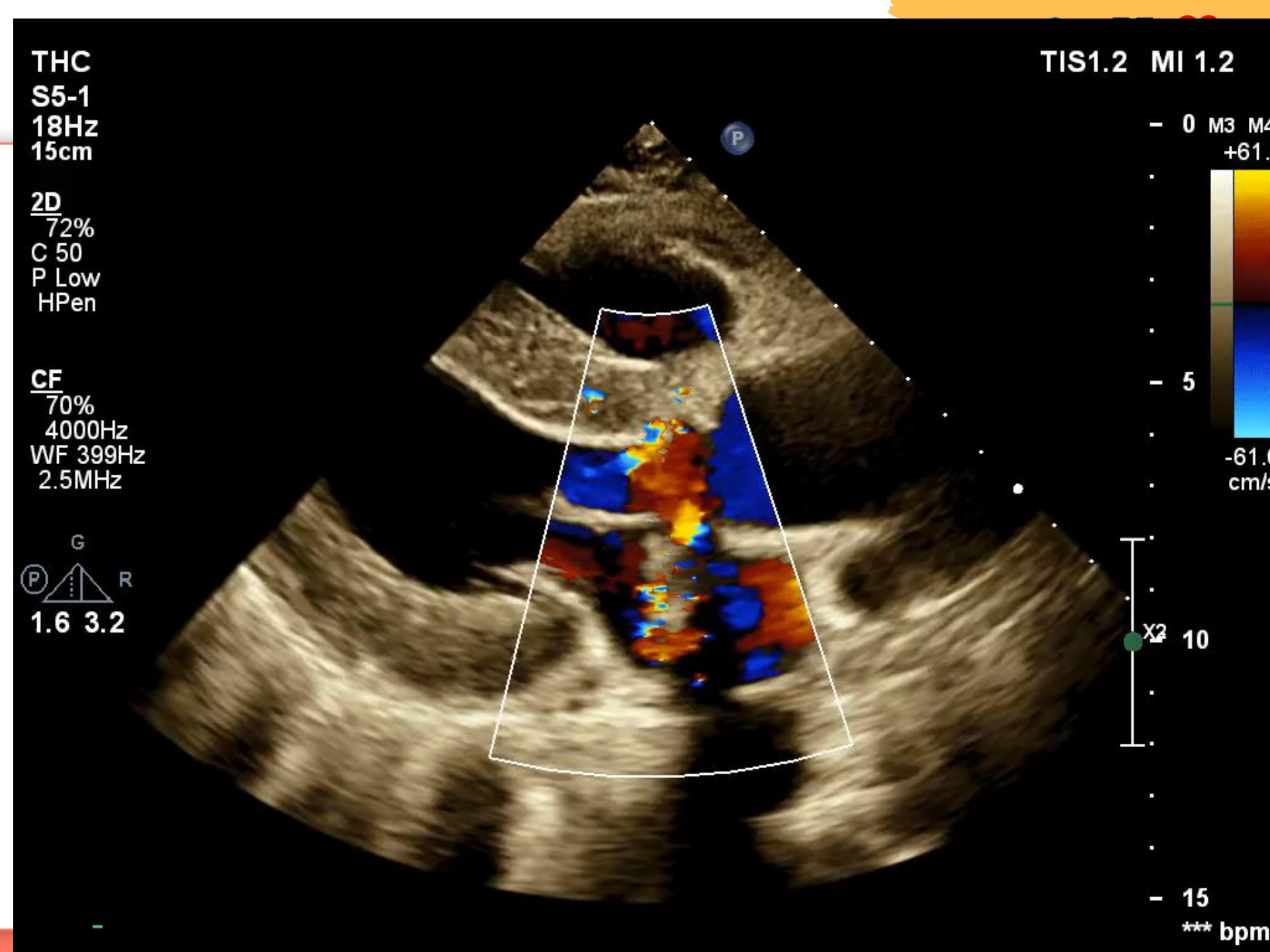

Heart center Hospital
SE: 1
IM: 1 of 1
THC
X5-1
21Hz
20cm
2D
65%
C 50
P Low
HPen
CF
55%
3549Hz
WF 354Hz
2.5MHz
CW
50%
WF 225Hz
1.8MHz
KHALIL POR^CHANGHIZ^^^
TIS0.6 MI 0.1
1136953
Study Date: 1403/10/18
Image Time: 11:15:38
M3 M4
+54.7
Vmax 222 cm/s
Max PG 20 mmHg
Mean PG 12 mmHg
VTI 41.7 cm
-54.7
cm/s
100
cm/s
-100
-200
-300
Zoom: 1.05
WW:255 WL:127
75mm/s
84bpm

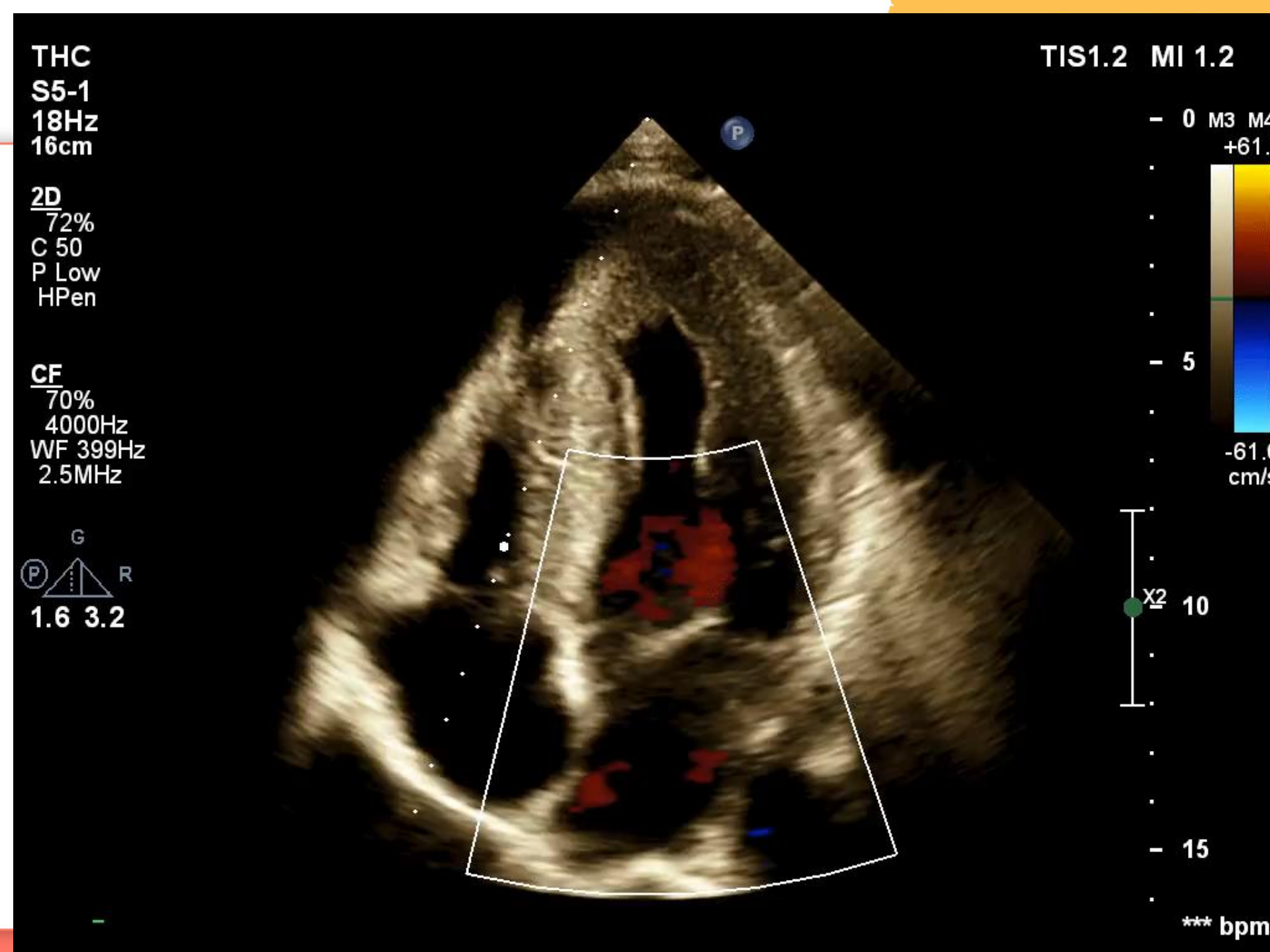



Surface Factors
Incomplete prosthesis endothelialization
Leaflet damage
Leaflet deterioration
Stent fracture
Prosthesis malpositioning
Relative Contribution to Prosthetic Valve Thrombosis
Hemodynamic Factors
Low cardiac output
Prosthesis malpositioning
Anatomical prosthesis position
Prosthetic hemodynamic profile
Hyperviscosity
Hemostatic Factors
Hyper-coagulable state*
Significant tissue injury
Heparin-induced thrombocytopenia
Suboptimal anticoagulation†
Platelet reactivity

PROSTHETIC LOW FLOW LOW GRADIENT MALFUNCTION(?)

- A60 YEARS OLDMAN WITH HX OF AVR(SJ#23)
- FOLLOW UP ECHO AFTER 1 YEARS


THC
S5-1
18Hz
15cm
2D
72%
C 50
P Low
HPen
CF
70%
4000Hz
WF 399Hz
2.5MHz
G
P
R
1.6 3.2
TIS1.2 MI 1.2
0 M3 M4
+61.
5
-61.
cm/
X2
10
15
*** bpm


THC
S5-1
18Hz
16cm
2D
72%
C 50
P Low
HPen
CF
70%
4000Hz
WF 399Hz
2.5MHz
G
P
R
1.6 3.2
TIS1.2 MI 1.2
0
M3 M4
+61.
5
-61.
cm/s
X2
10
15
*** bpm

TEHRAN HEART CENTER
SE: 1
IM: 1 of 1

shanai^sami^18^^
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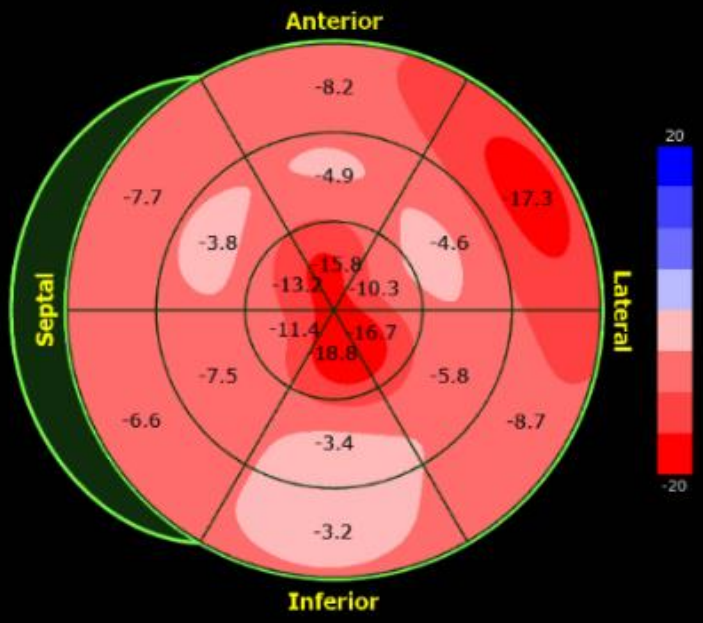
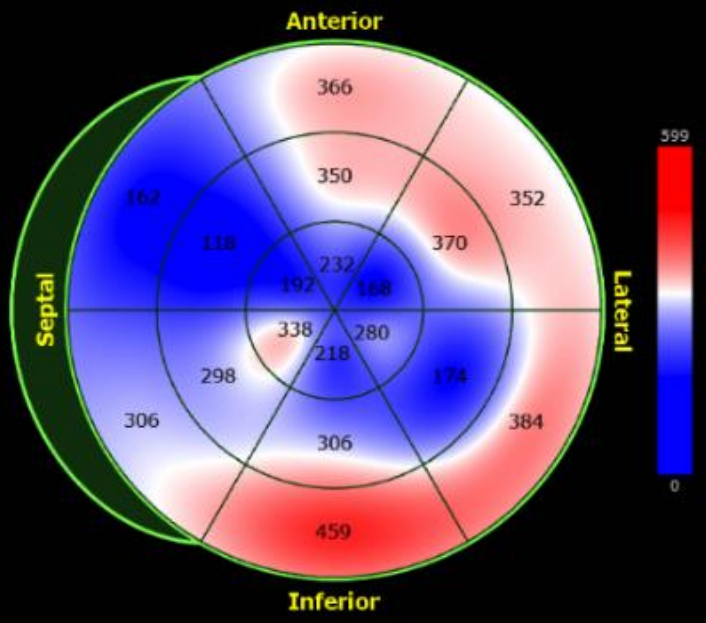
Study Date: 1403/10/13
Image Time: 10:25:30

Peak-Systolic
Longitudinal Strain [%]



Time to Peak
Longitudinal Strain [ms]



Zoom: 0.75
WW:255 WL:127

recently reported occult cardiac ATTR in 16% of patients post-TAVR. We investigated the coexistence of cardiac ATTR in patients with severe AS before undergoing TAVR.

30% in low flow low gradient AS

No regression of LVH after 1 years

Echo for Cardiac Amyloidosis

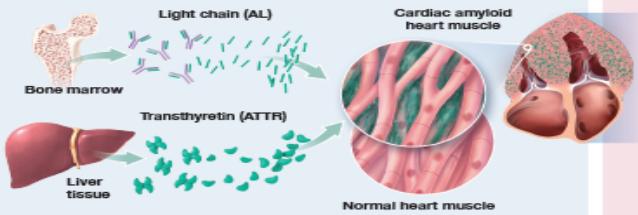
ASE American Society of Echocardiography — Sound Saves Lives

Pfizer

What is Cardiac Amyloidosis (CA)?

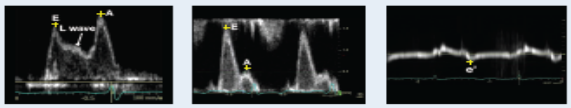
A form of restrictive infiltrative cardiomyopathy due to deposition of amyloid fibrils in the myocardium.

There are 2 common types. Similar echo features are seen in both types of CA.



Doppler Echocardiography in CA

Progressive diastolic dysfunction is a feature of CA.
This may only be mildly abnormal in early stages of the disease.



Pulsed wave Doppler of the mitral inflow:

This ranges from a low E/A ratio (<0.8) suggesting restrictive hemodynamics. Abnormal relaxation pattern is less common in CA but may be present in early stage. Note L wave is a clue to elevated filling pressure.

Tissue Doppler:

Strongly suggestive:
- Mitral annular TDI < 6 cm/sec
- Small A wave in sinus rhythm

Not suggestive:
- Septal or lateral tissue Doppler e' > 10 cm/s

Rule of 5 (5-5-5)

All e', a', s' velocities < 5 cm/s

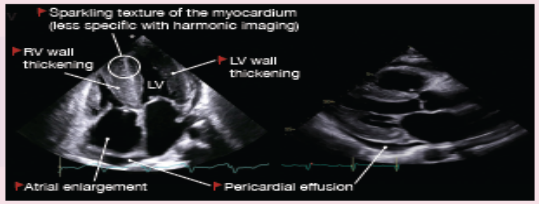
This is a clue to the diagnosis of CA.

Key Points

- **Echo may be the first clue to the diagnosis of amyloidosis.**
- Classic: thickened myocardium, diastolic dysfunction, and abnormal strain (apical sparing)
- Atypical or subtle findings may be seen in early disease
- Consider strain imaging whenever amyloid suspected
- Echo alone is not diagnostic of CA, nor can it differentiate between AL and ATTR.

Echo Red Flags

Apical 4 chamber view (left) and parasternal long axis view (right) displaying the typical features of CA.



- Reduced mitral TDI velocities
- Reduced GLS with apical sparing
- Low flow low gradient AS
- Diastolic dysfunction (≥grade 2)

Clinical Red Flags

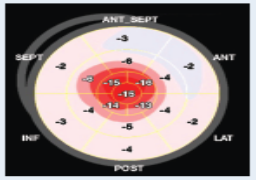
- Heart failure
- Nephrotic syndrome
- Peripheral or autonomic neuropathy
- Weight loss
- Bilateral carpal tunnel
- Spinal stenosis
- Periorbital purpura

Strain Analysis in CA

Myocardial deformation ("strain") measured by 2-dimensional speckle tracking imaging is very useful in CA. Longitudinal strain is the measure of the longitudinal contractile function of the heart.

When to do strain:

If feasible anytime there is increased LV wall thickness, especially in:
- Over 65 year olds
- Heart failure
- No history of poorly controlled HTN



Global longitudinal strain (GLS):

Normal values of GLS vary between vendors; normal is usually considered to be more negative than -20% with an SD of =- 2% (lower limit of normal -16% to -18%, depending on vendor).
Values nearing 0% suggest more dysfunction and either advanced disease or disease progression.

Strain pattern:

In cardiac amyloidosis the segmental strain curves representing the apical segments will have a further deflection away from the 0 line than the curves representing the basal segments. When plotted on a bullseye, this will generate a characteristic "apical sparing" pattern visually.

Strain ratios:

Longitudinal strain ratios that have been described, with the diagnostic cutoffs used in the original publications: proposed ratios incorporating LV GLS for diagnosis of CA.

Sara A.M. Cuddy, MD; Michael Chetrit, MD; Madeline Jankowski, BS, RDCS, ACS, FASE; Milind Desai, MD, MBA; Rodney H. Falk, MD; Rory B. Weiner, MD, FASE; Allan L. Klein, MD, FASE; Dermot Phelan, MD, PhD, FASE; Martha Grogan, MD. Practical Points for Echocardiography in Cardiac Amyloidosis. JASE 2022; 35(9): A31-A40.

PP-VDM-USA-1526

Poster ordering information available at: ASEcho.org
Content was developed by ASE with support from Pfizer Inc.
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Access resources on Amyloidosis and full Journal article:

Clinical Features

Extra-cardiac

- Age ≥ 65
- Black race
- Family history
- Dysautonomia
- Sensorimotor polyneuropathy
- Lumbar spinal stenosis
- Trigger finger
- Bilateral carpal tunnel syndrome
- Atraumatic biceps tendon rupture
- Skin bruising
- Periorbital purpura
- Vitreous opacity, pupillary changes
- Macroglossia
- Proteinuria / Frothy urine

Cardiac

- Hypotension
- Natural cure of hypertension
- Symptoms of heart failure: shortness of breath, edema, dizziness, syncope

Imaging Techniques and Features

Electrocardiogram

- Pseudoinfarct pattern
- Low Voltage-Mass ratio
- Atrioventricular conduction abnormalities

Echocardiogram

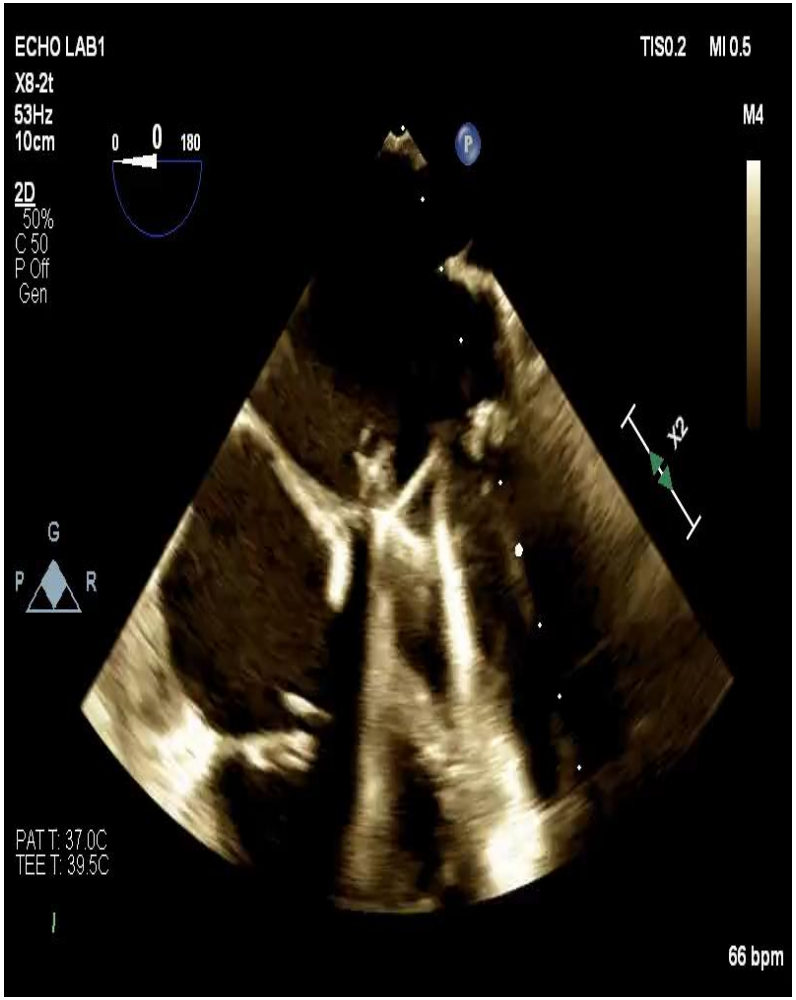
- Granular sparkling of myocardium
- Pericardial effusion
- Low-flow low-gradient phenotype
- Mitral annular S' < 6 cm/s
- Reduced longitudinal strain with apical sparing
- Atrial electromechanical dissociation

Cardiac Magnetic Resonance

- Diffuse subendocardial or transmural LGE
- Elevated native T1 values
- Extracellular volume expansion
- Abnormal gadolinium kinetics

- A 63 years old man with hx of MVR(SJ#27)


ECHO LAB1
TIS0.2 MI 0.5
X8-2t
53Hz
10cm
0 55 180
M4
2D
55%
C 50
P Off
Gen
X2
G
P R
PAT T: 37.0C
TEE T: 38.7C
66 bpm

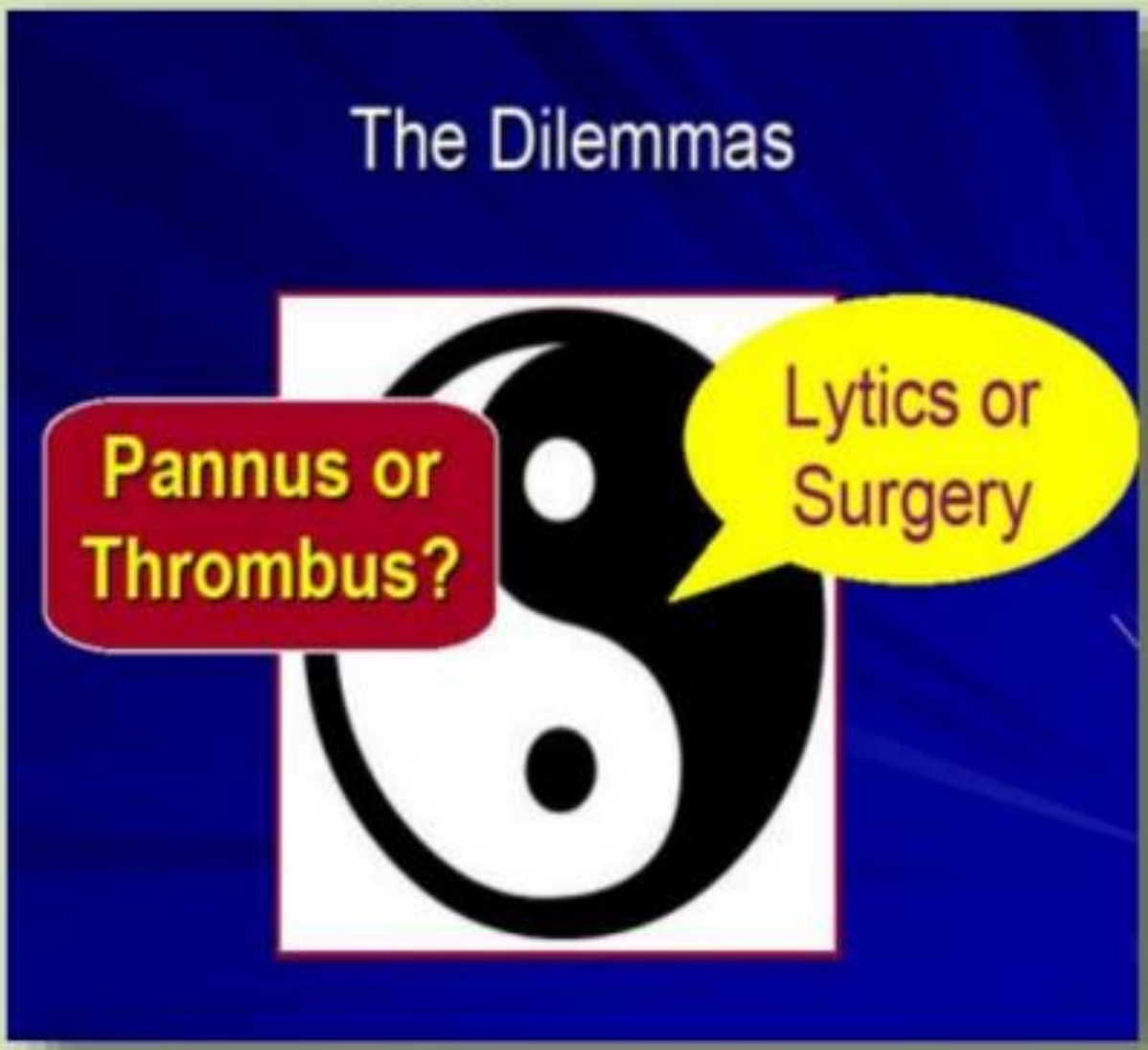

ECHO LAB1
TIS0.2 MI 0.5
X8-2t
53Hz
10cm
0 0 180
M4
2D
50%
C 50
P Off
Gen
X2
G
P R
PAT T: 37.0C
TEE T: 39.5C
66 bpm

- Prosthetic valve malfunction is emergent condition such as acute MI, dissection , acute PTE
- Step 1:diagnosis
- Step2: pannus or thrombus
- Steps3:fibrinolytic or surgery(heart team thinking)

Obstruction of Mechanical Prosthetic Heart Valves

Imaging modalities

The Dilemmas



TTE

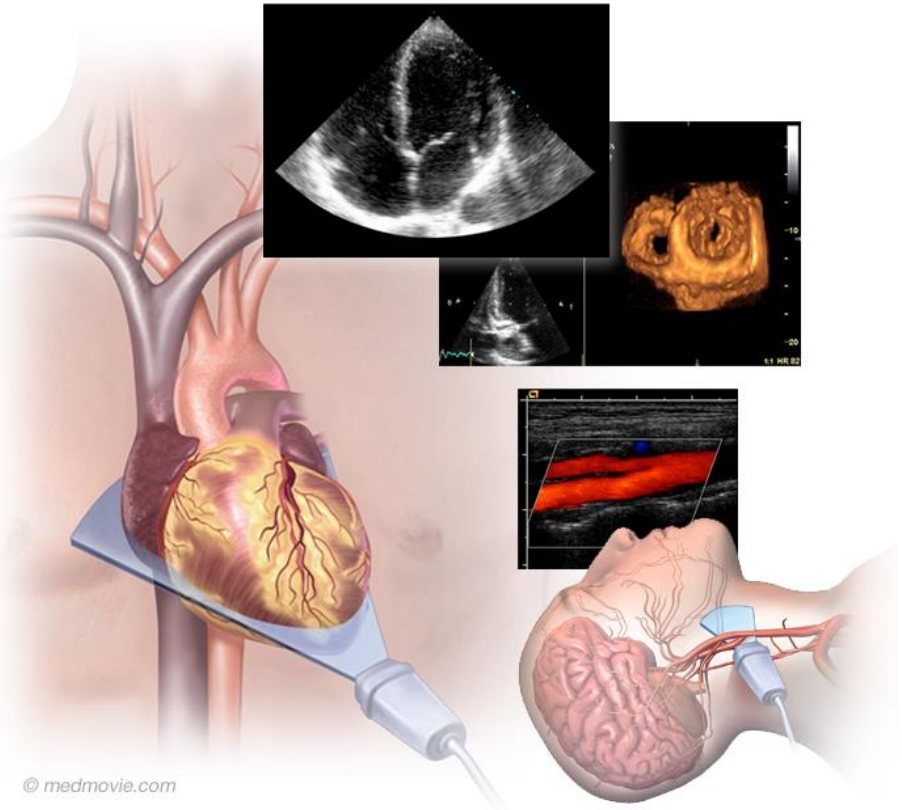
TEE

CF

MDCT

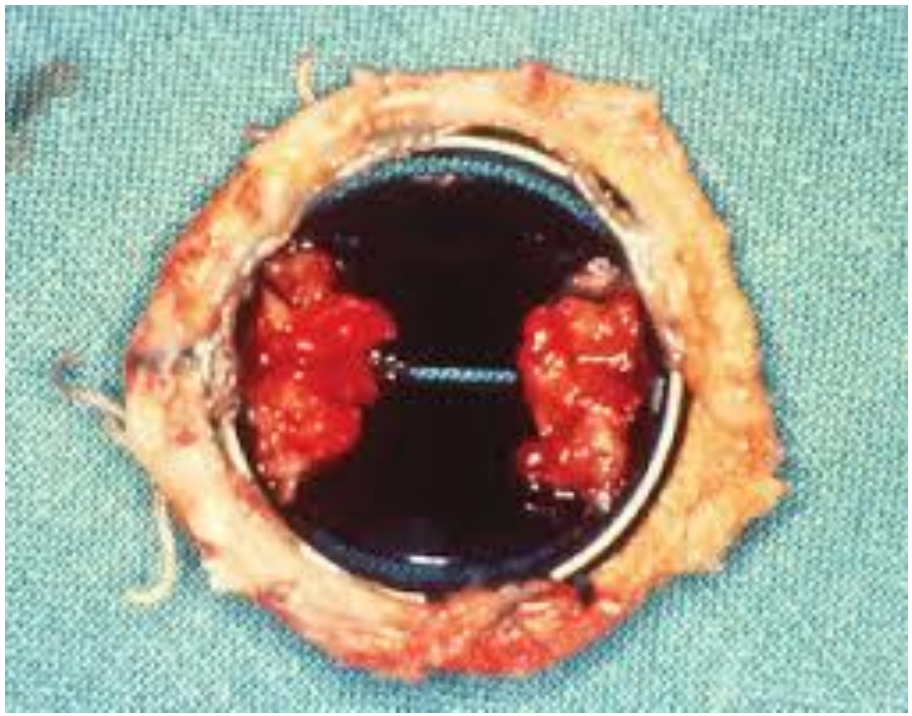
diagnosis

- Echocardiography (TTE & 3DTEE)
- Cinefluoroscopy
- CT challenging cases



Physiopathology of obstruction of prosthetic heart valves

- Thrombus Formation
- Pannus Ingrowth
- A Combination of Both
- Infective Endocarditis



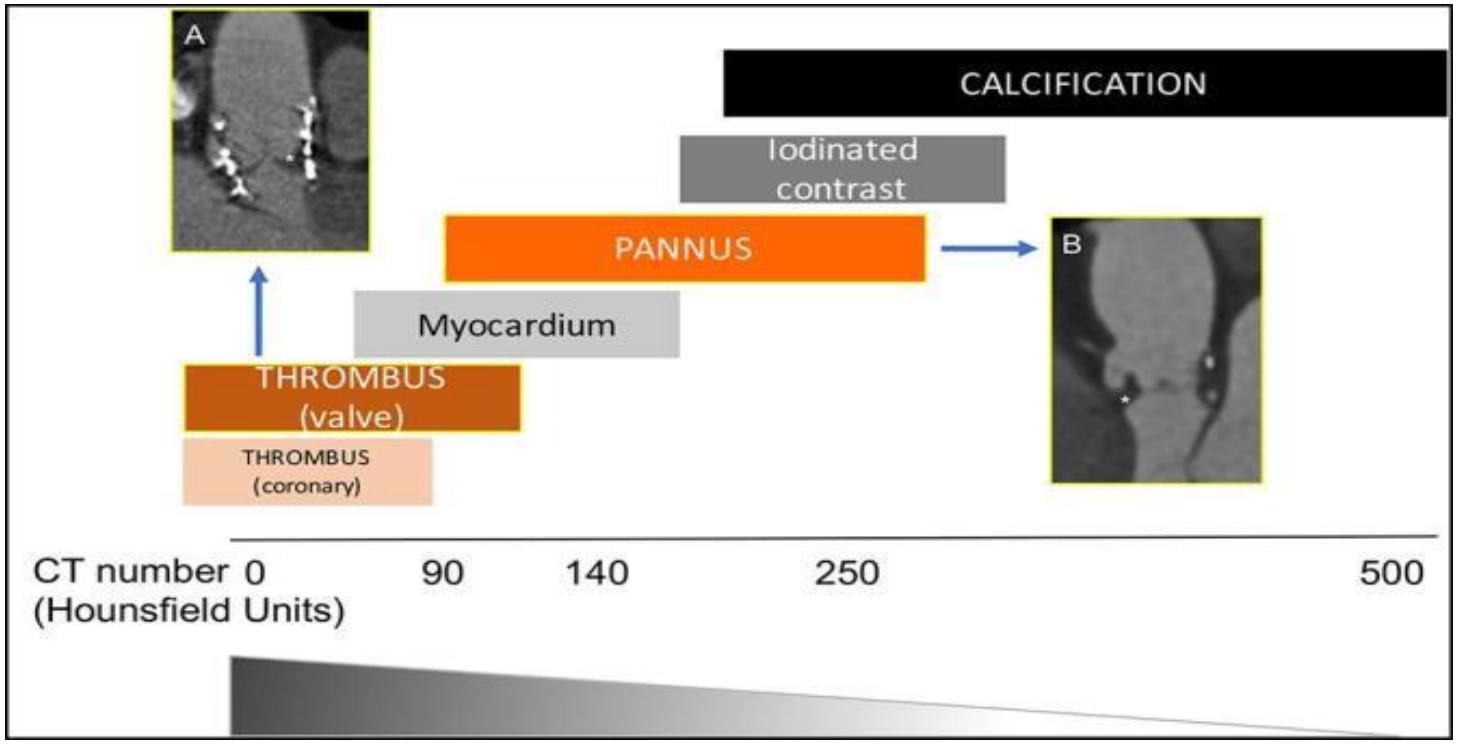
distinction between thrombus and pannus

Thrombosis:

- history of inadequate anticoagulation
- acute onset of valve dysfunction
- Large, mobile, less echodense mass in echocardiography

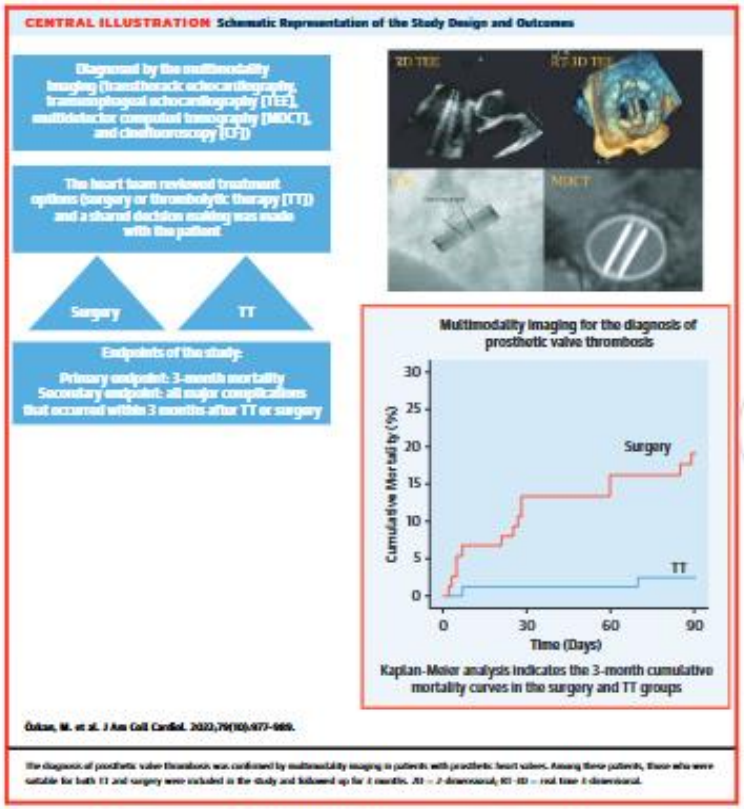
Pannus:

- Small, fixed, highly echogenic mass
- Common in aortic position
- Gradual unset of symptoms
- Serial echo (previous echo)



The etiology of valve dysfunction can be discerned by using attenuation values to help differentiate thrombus from pannus. A cutoff point of ≥145 HU more likely represents pannus, with values below this more likely representing thrombus.

CENTRAL ILLUSTRATION Schematic Representation of the Study Design and Outcomes



Özkan, M. et al. J Am Coll Cardiol. 2022;79(10):977-989.

The diagnosis of prosthetic valve thrombosis was confirmed by multimodality imaging in patients with prosthetic heart valves. Among these patients, those who were suitable for both TT and surgery were included in the study and followed up for 3 months. 2D = 2-dimensional; 3D-3D = real time 3-dimensional.

thrombectomy. The outcomes of each treatment strategy for PVT have been evaluated by several meta-analyses and systematic reviews. Previously, Karthikeyan et al[3] evaluated 600 episodes and 7 PVT studies and reported the mortality rates of surgery and TT as 13.5% and 9%, respectively. Moreover, they recommended urgent surgical intervention to be preferred to TT in experienced centers.[3] Besides, in a meta-analysis authored by Castillo et al,[4] which evaluated 27 studies with 1,107 patients treated by TT and 26 studies with 1,132 patients operated for PHVT, the mortality rate in the TT and surgery groups were 6.6% and 18.1%, respectively. The present study has a relatively high mortality rate among surgically treated patients compared with the published literature. However, the current literature may not reflect

Thrombolysis or Surgery in Patients With Obstructive Mechanical Valve Thrombosis

The Multicenter HATTUSHA Study

Mehmet Özkan, MD,[a,b] Sabahattin Gündüz, MD,[a] Ahmet Güner, MD,[c] Mucit Kalçık, MD,[d] Mustafa Ozan Gürsoy, MD,[e] Begüm Uygur, MD,[f] Nurgen Keleş, MD,[g] Hasan Kaya, MD,[g] Alev Kılıçgedik, MD,[a] Emrah Bayam, MD,[a] Semih Kalkan, MD,[a] Mehmet Ali Astarcıoğlu, MD,[h] Süleyman Karakoyun, MD,[i] Mahmut Yesin, MD,[j] Duygu İnan, MD,[f] Ali Fedakar, MD,[j] Sabit Sankaya, MD,[j] Mehmet Aksit, MD,[j] Burak Ozan, MD,[k] Cevdet Uğur Koçoğullan, MD[l]

ABSTRACT

BACKGROUND Prosthetic valve thrombosis (PVT) is one of the life-threatening complications of prosthetic heart valve replacement. Due to the lack of randomized controlled trials, the optimal treatment of PVT remains controversial between thrombolytic therapy (TT) and surgery.

OBJECTIVES This study aimed to prospectively evaluate the outcomes of TT and surgery as the first-line treatment strategy in patients with obstructive PVT.

METHODS A total of 158 obstructive PVT patients (women, 103 [65.2%], median age 49 years [IQR: 39-60 years]) were enrolled in this multicenter observational prospective study. TT was performed using slow (6 hours) and/or ultraslow (25 hours) infusion of low-dose tissue plasminogen activator (t-PA) (25 mg) mostly in repeated sessions. The primary endpoint of the study was 3-month mortality following TT or surgery.

RESULTS The initial management strategy was TT in 83 (52.5%) patients and surgery in 75 (47.5%) cases. The success rate of TT was 90.4% with a median t-PA dose of 50 mg (IQR: 37.5-100 mg). The incidences of outcomes in surgery and TT groups were as follows: minor complications (29 [38.7%] and 7 [8.4%], respectively), major complications (31 [41.3%] and 5 [6%], respectively), and the 3-month mortality rate (34 [38.7%] and 2 [2.4%], respectively).

CONCLUSIONS Low-dose and slow/ultraslow infusion of t-PA were associated with low complications and mortality and high success rates and should be considered as a viable treatment in patients with obstructive PVT.
(J Am Coll Cardiol 2022;79:977-989) © 2022 by the American College of Cardiology Foundation.

From the [a]Kosuyolu Kartal Heart Training and Research Hospital, Department of Cardiology, Istanbul, Turkey; [b]Acıbadem University, Faculty of Health Sciences, Acıbadem, Turkey; [c]Mehmet Akif Ersoy Thoracic and Cardiovascular Surgery Training and Research Hospital, Department of Cardiology, Istanbul, Turkey; [d]Hitit University, Faculty of Medicine, Department of Cardiology, Corum, Turkey; [e]Gazi Kalp Çelebi University, Atatürk Training and Research Hospital, Department of Cardiology, Izmir, Turkey; [f]Dr Siyami Ersek Thoracic and Cardiovascular Surgery Training and Research Hospital, Department of Cardiology, Istanbul, Turkey; [g]Bahçeşehir University, Faculty of Medicine, Department of Cardiology, Istanbul, Turkey; [h]Bahçeşehir University, Faculty of Medicine, Department of Cardiology, Beylikdüzü, Turkey; [i]Kartal Dr Lütfi Kırdar Health Sciences University, Department of Cardiology, Kartal, Turkey; [j]Kars Kafkas University, Faculty of Medicine, Department of Cardiology, Kars, Turkey; [k]Kosuyolu Kartal Heart Training and Research Hospital, Department of Cardiovascular Surgery, Istanbul, Turkey; [l]Mehmet Akif Ersoy Thoracic and Cardiovascular Surgery Training and Research Hospital, Department of Cardiovascular Surgery, Istanbul, Turkey; and the [m]Dr Siyami Ersek Thoracic and Cardiovascular Surgery Training and Research Hospital, Department of Cardiovascular Surgery, Istanbul, Turkey.

The authors attest they are in compliance with human studies committees and animal welfare regulations of the authors' institutions and Food and Drug Administration guidelines, including patient consent where appropriate. For more information, visit the Author Center.

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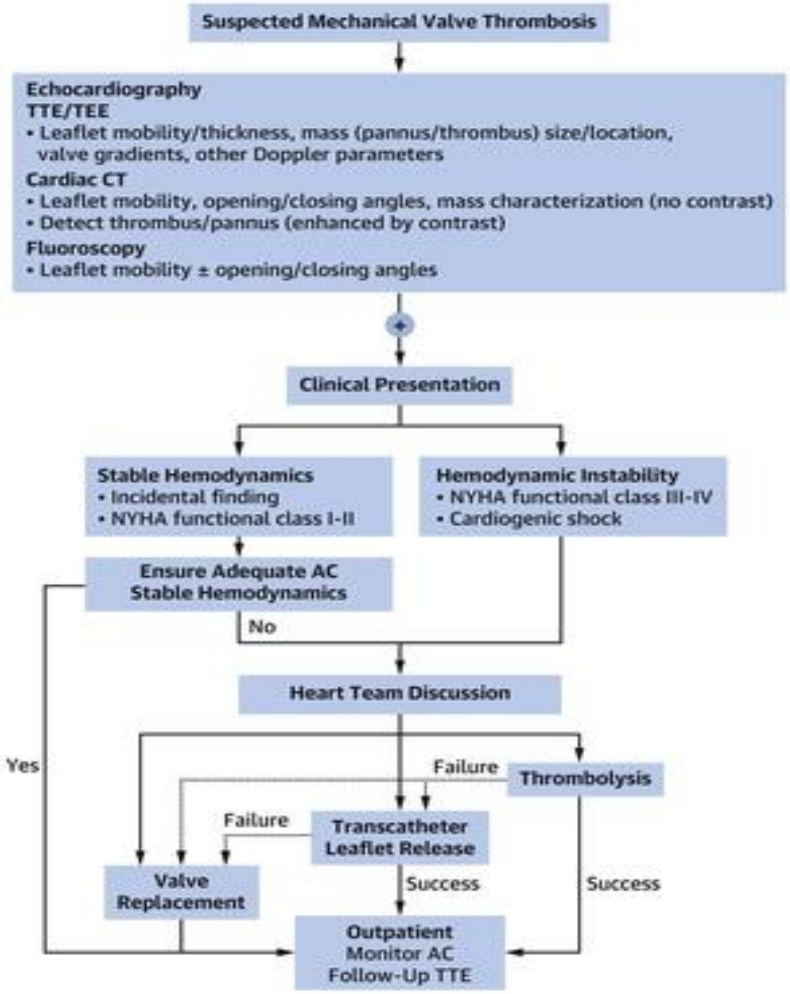
HEAT TEAM THINKING

- RATE OF SUCCESS OF FIBRINOLYTIC
- RATE OF MAJOR BLEEDING
- RISK OF REDO SURGERY

Favor Surgery	Favor Fibrinolytic
Readily available surgical expertise	No surgical expertise available
Low surgical risk	High surgical risk
Contraindication to fibrinolysis	No contraindication to fibrinolysis
Recurrent valve thrombosis	**First-time episode of valve thrombosis**
NYHA class IV	**NYHA class I–III**
Large clot (>0.8 cm2)	Small clot (≤0.8 cm2)
Left atrial thrombus	No left atrial thrombus
Concomitant CAD in need of revascularization	No or mild CAD
Other valve disease	No other valve disease
Possible pannus	Thrombus visualized

CENTRAL ILLUSTRATION: Algorithm for the Evaluation and Management of Mechanical Valve Thrombosis



Soria Jiménez CE, et al. J Am Coll Cardiol. 2023;81(21):2115-2127.

- 2014- 2020-2024 AHA
- 2017- 2021 ESC
- FIBRINOLYTIC PREFER TO SURGERY
- HEART TEAM decision making
- FCIII-IV – CARDIOGENIC SHOCK (SURGERY)

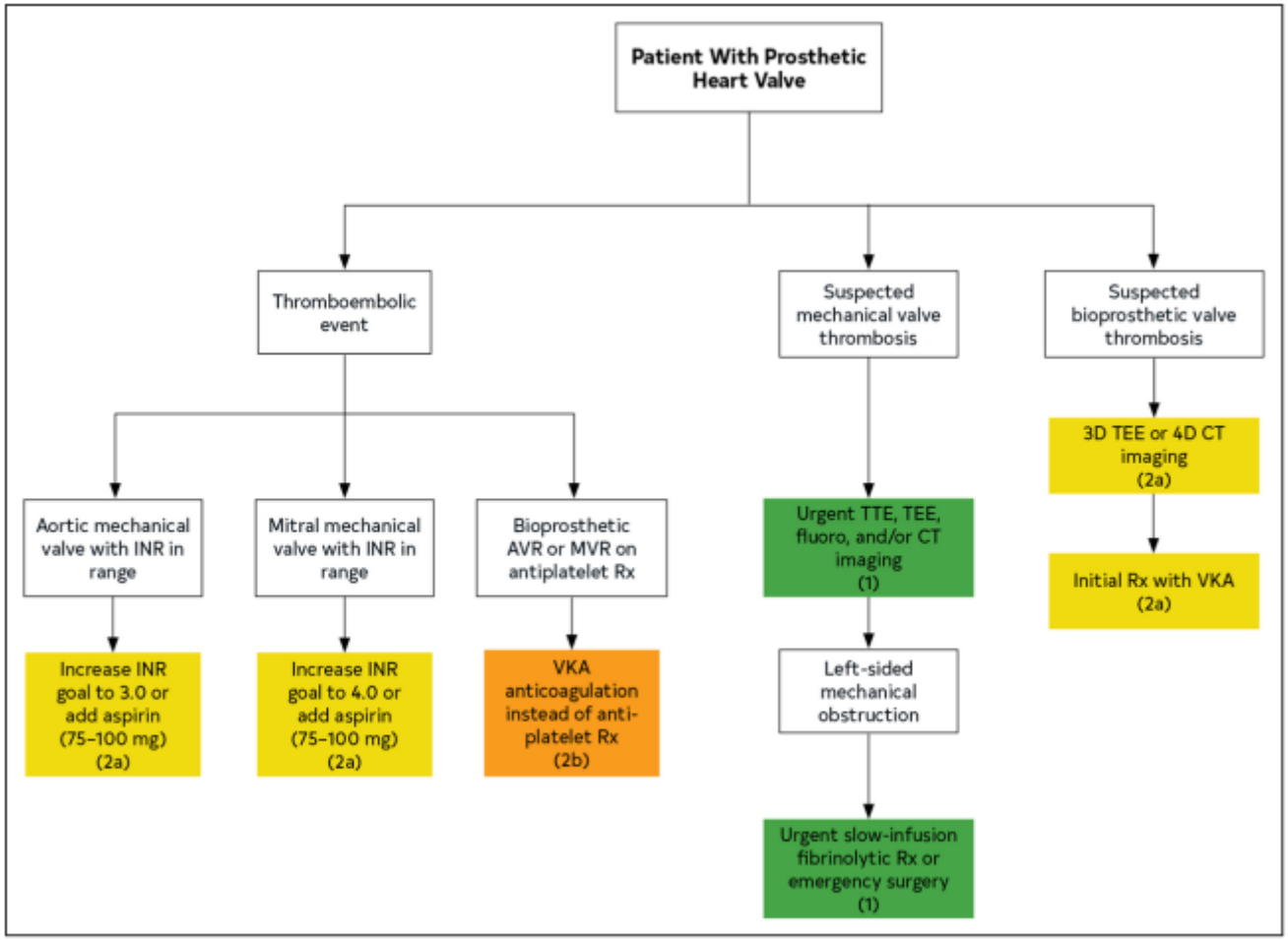
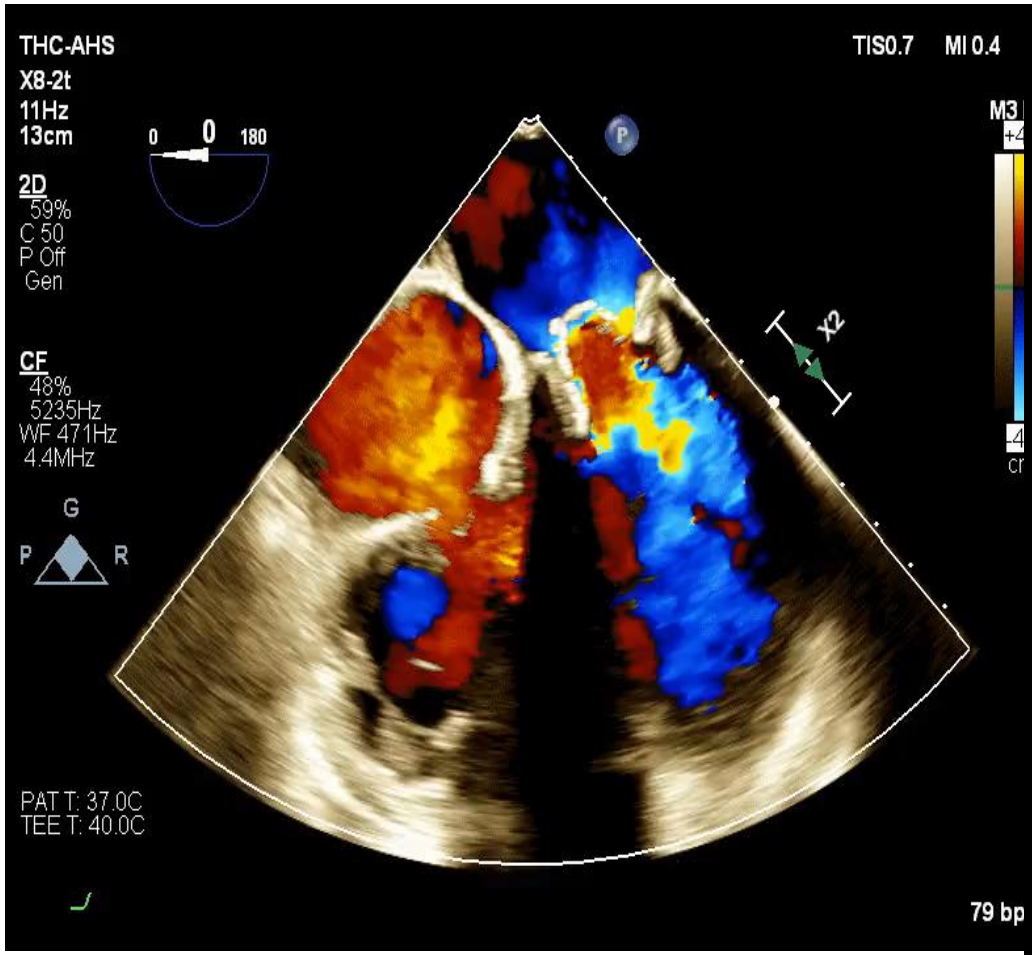


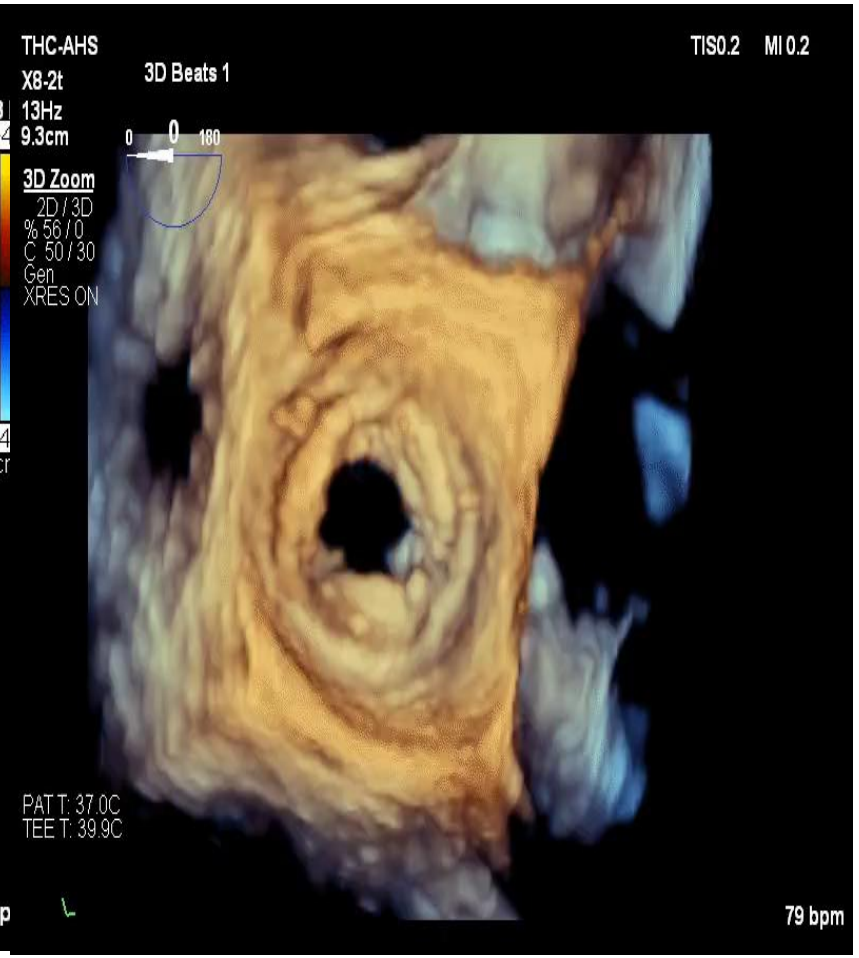
Figure 13. Management of embolic events and valve thrombosis.
Colors correspond to Table 2. 3D indicates 3-dimensional; 4D, 4-dimensional; AVR, aortic valve replacement; CT, computed tomography; INR, international normalized ratio; MVR, mitral valve replacement; Rx, medication; TEE, transesophageal echocardiography; TTE, transthoracic echocardiography; and VKA, vitamin K

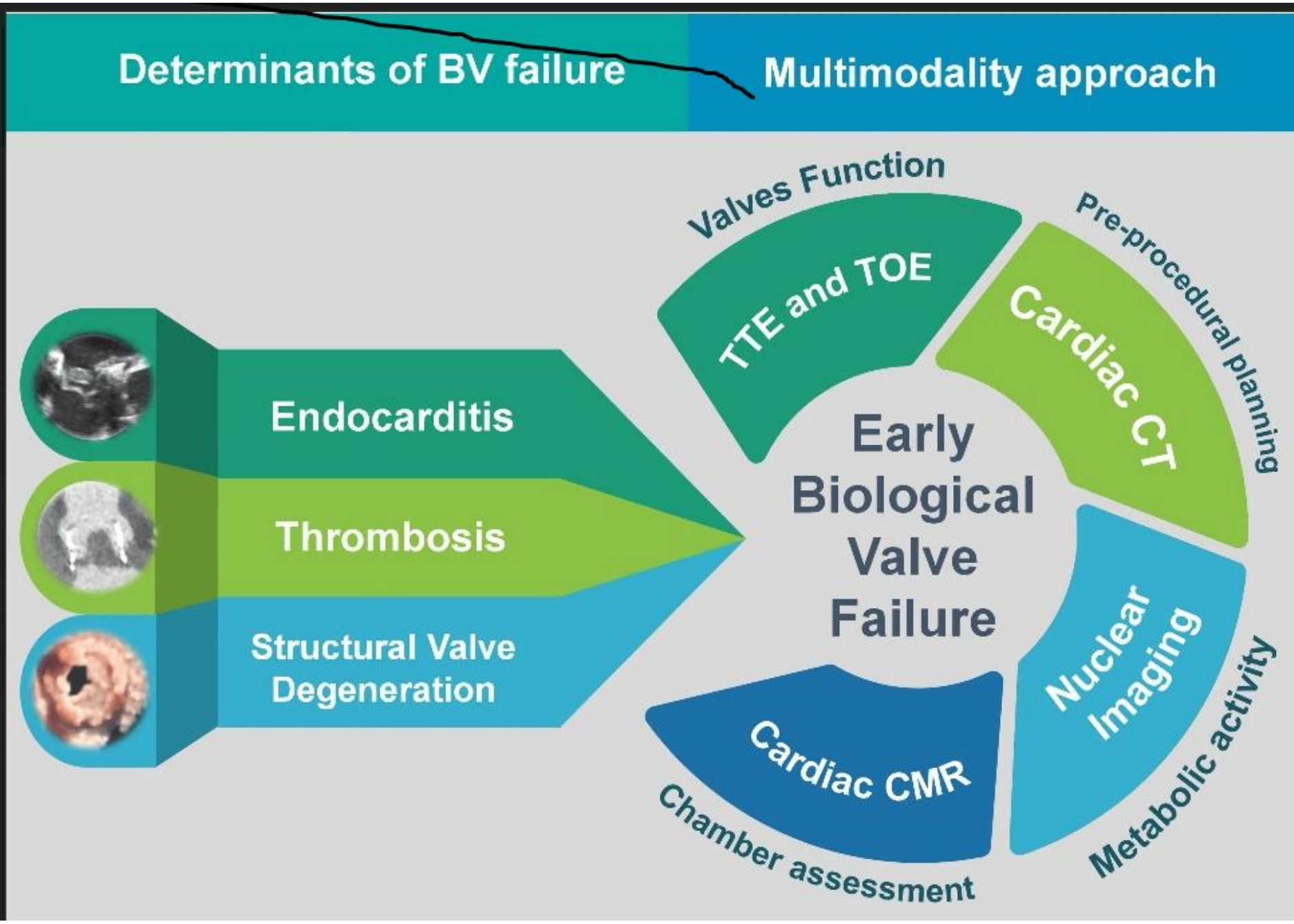
- A 25 years old woman MVR(bio, perimount magna#27) 3 month with hx of dyspnea fc||-|||


THC-AHS
X8-2t
53Hz
13cm
Z 2.0
2D
57%
C 50
P Off
Gen
0
72
180
TIS0.2
MI 0.5
M3
G
P
R
PAT T: 37.0C
TEE T: 39.9C
79 bpm


THC-AHS
X8-2t
53Hz
13cm
Z 2.0
2D
57%
C 50
P Off
Gen
0
72
180
TIS0.2
MI 0.5
M3
G
P
R
PAT T: 37.0C
TEE T: 39.9C
79 bpm


THC-AHS
X8-2t
11Hz
13cm
TIS0.7 MI 0.4
2D
59%
C 50
P Off
Gen
CF
48%
5235Hz
WF 471Hz
4.4MHz
G
P R
X2
PAT T: 37.0C
TEE T: 40.0C
79 bp


THC-AHS
X8-2t
13Hz
9.3cm
M3
3D Zoom
2D / 3D
% 56 / 0
C 50 / 30
Gen
XRES ON
3D Beats 1
TIS0.2 MI 0.2
PAT T: 37.0C
TEE T: 39.9C
79 bpm

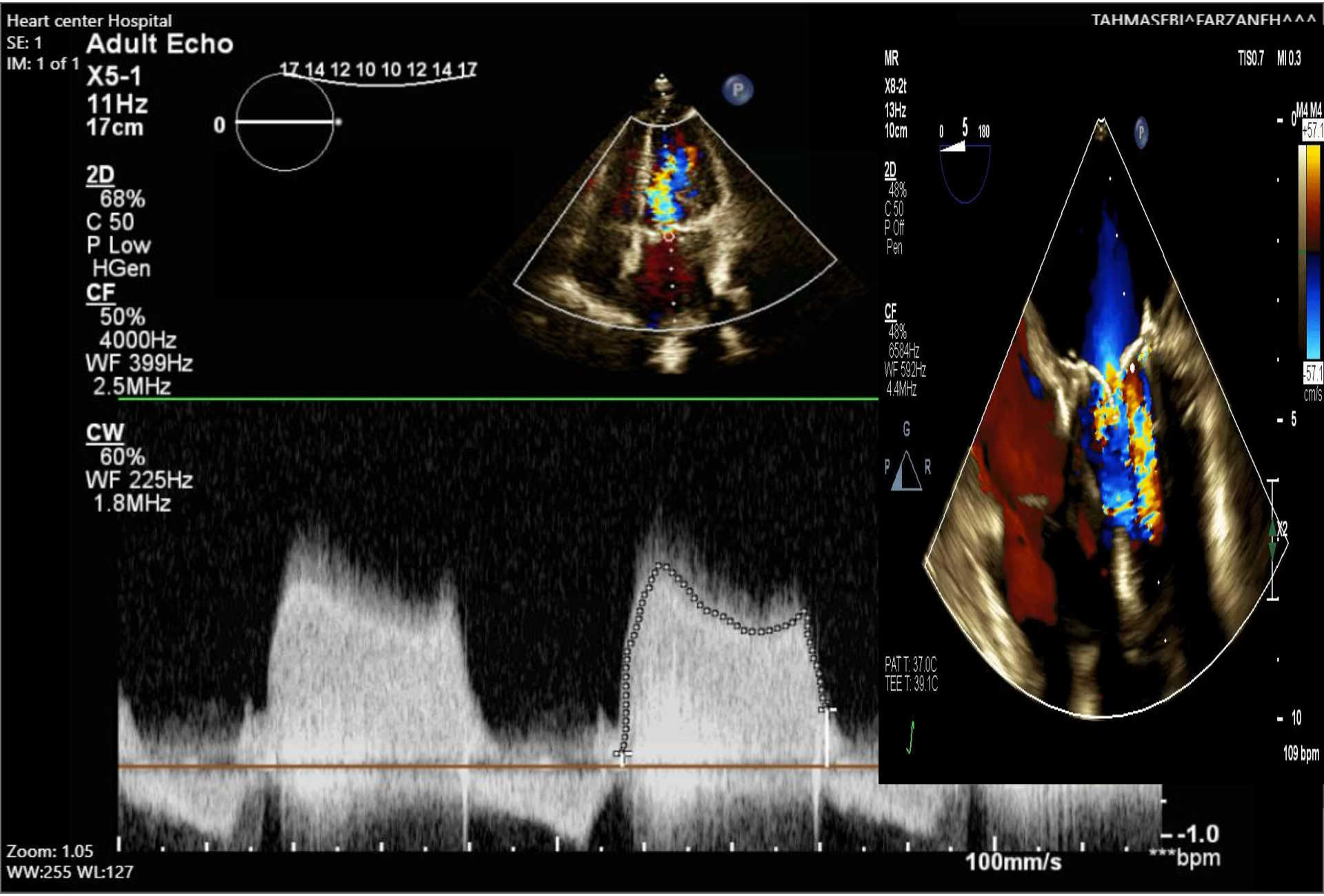

Determinants of BV failure
Multimodality approach
Endocarditis
Thrombosis
Structural Valve Degeneration
Early Biological Valve Failure
Valves Function
TTE and TOE
Pre-procedural planning
Cardiac CT
Nuclear Imaging
Metabolic activity
Cardiac CMR
Chamber assessment

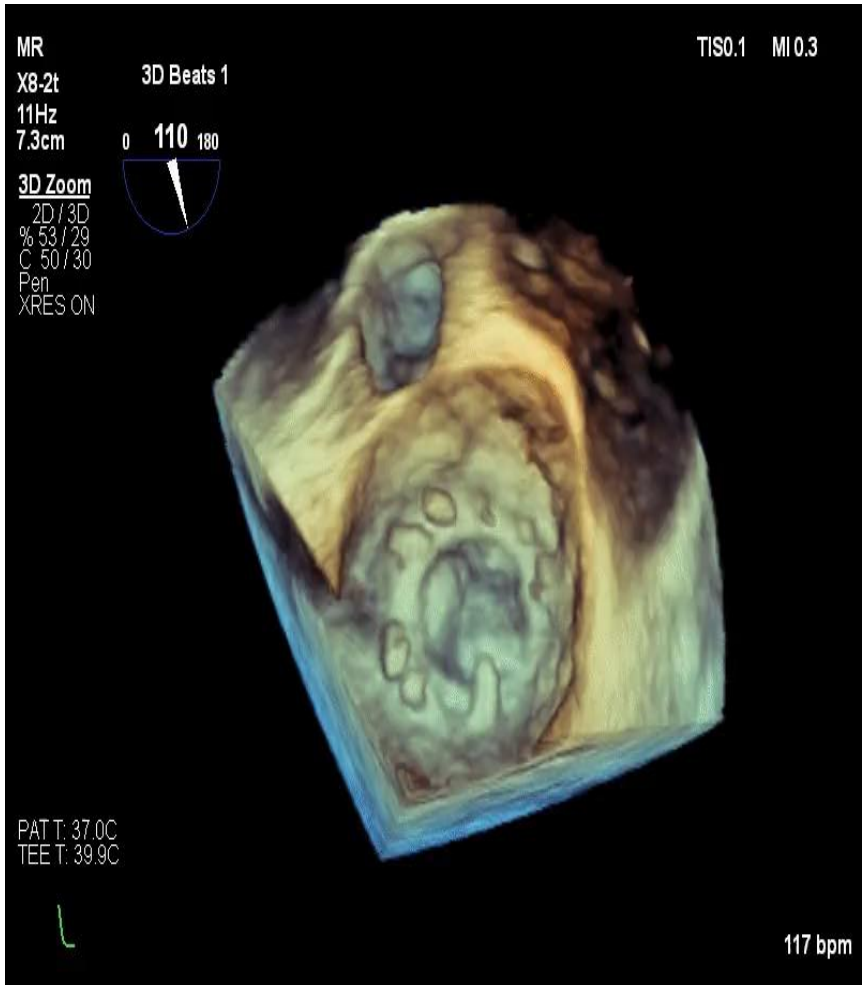
PREMATURE OR EARLY BIO FAILURE

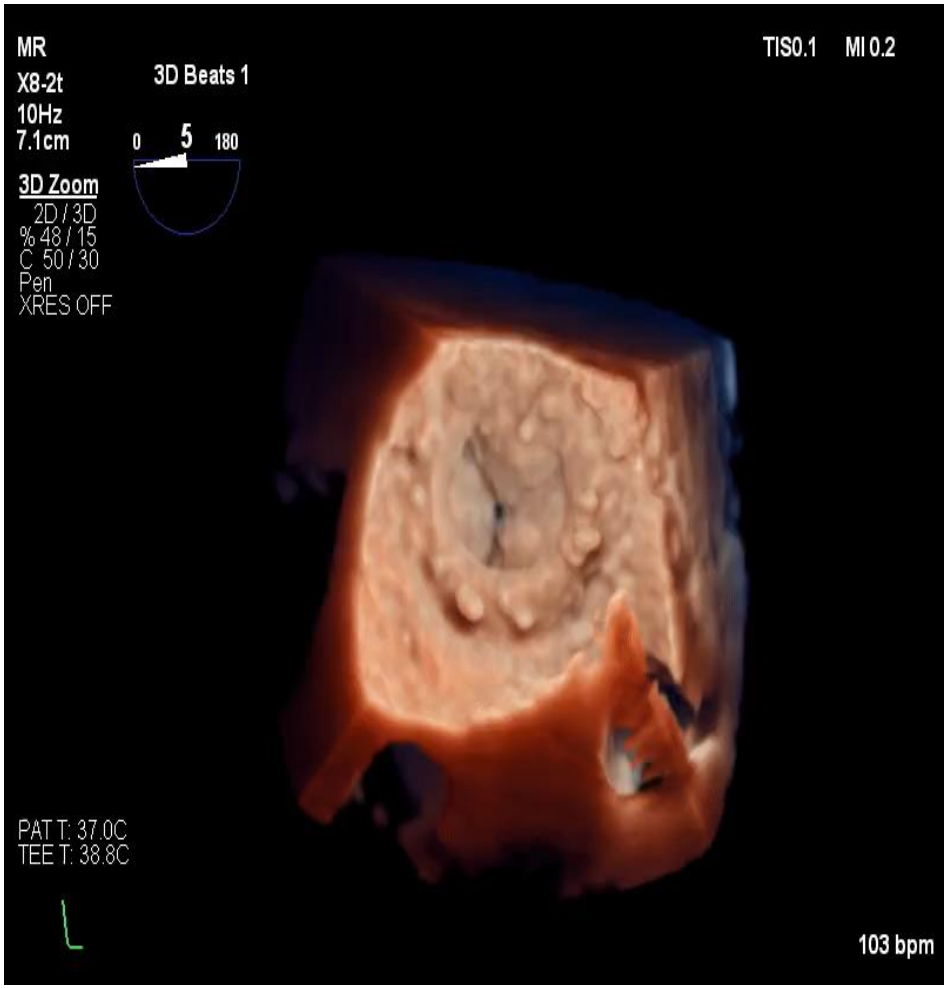
- ENDOCARDITIS
- THROMBOSIS
- PATIENT PROSTESIS MISMATCH(EARLY DEGENERATION)
- FLAIL BIO DUE TO IATROGENIC TRUMA or STRUCTURAL PROBLEM

- HEART TEAM ;
- R/O ENDOCARDITIS
- VALVE IN VALVE
- REDO SURGERY

- A 64 years old woman AVR (hancockII#27) 8 years ago WITH HX OF DYSPNEA FC |||-|V and significant increased gradient


Heart center Hospital
SE: 1
IM: 1 of 1
Adult Echo
X5-1
11Hz
17cm
17 14 12 10 10 12 14 17
0
2D
68%
C 50
P Low
HGen
CF
50%
4000Hz
WF 399Hz
2.5MHz
CW
60%
WF 225Hz
1.8MHz
Zoom: 1.05
WW:255 WL:127
100mm/s
-1.0
***bpm
TAHMASBI^FAR7ANFH^^^
MR
X8-2t
13Hz
10cm
TIS0.7 MI 0.3
2D
48%
C 50
P Off
Pen
CF
48%
6584Hz
WF 592Hz
4.4MHz
PAT T: 37.0C
TEE T: 39.1C
109 bpm
cm/s


MR
X8-2t
11Hz
7.3cm
3D Beats 1
0 110 180
3D Zoom
2D / 3D
% 53 / 29
C 50 / 30
Pen
XRES ON
TIS0.1 MI 0.3
PAT T: 37.0C
TEE T: 39.9C
117 bpm


MR
X8-2t
10Hz
7.1cm
3D Beats 1
0 5 180
3D Zoom
2D / 3D
% 48 / 15
C 50 / 30
Pen
XRES OFF
TIS0.1 MI 0.2
PAT T: 37.0C
TEE T: 38.8C
103 bpm

SVD Definition

SVD Stage 0	• No significant change from immediate post implantation*
SVD Stage 1	• Morphological leaflet abnormality without significant hemodynamic changes†
SVD Stage 2S	• Moderate stenosis‡
SVD Stage 2R	• Moderate regurgitation§
SVD Stage 2RS	• Moderate stenosis and moderate regurgitation
SVD Stage 3	• Severe stenosis and/or severe regurgitation

- Valve in valve
- Redo surgery
- R/o bioprosthetic valve thrombosis(early degeneration) and IE
- Multimodality imaging (CT)

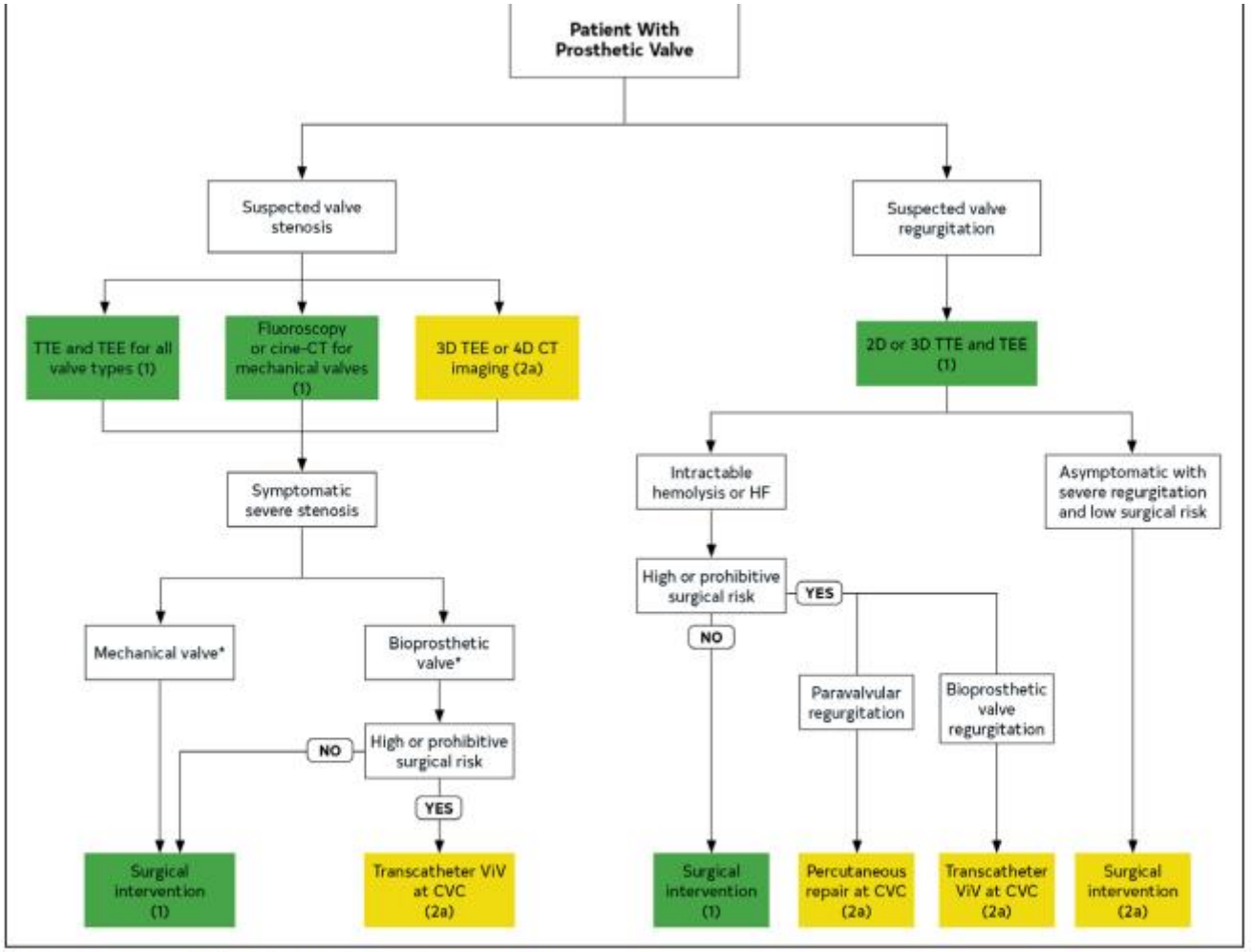
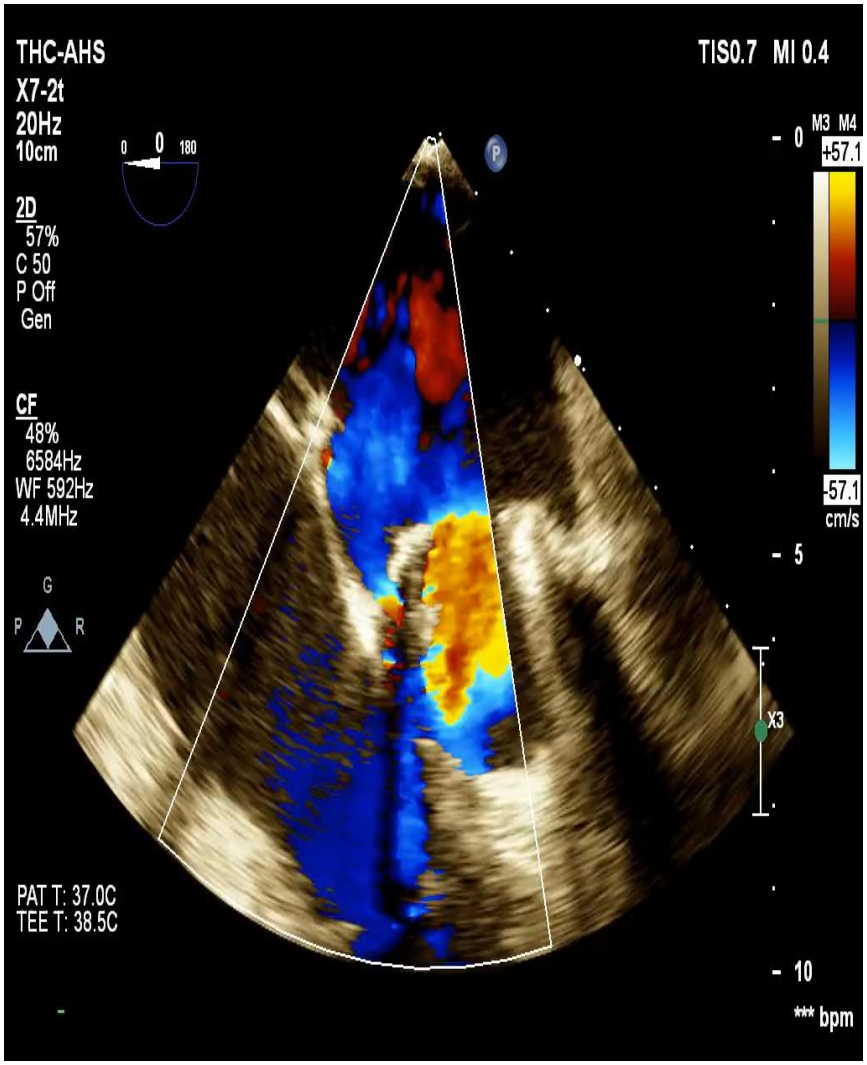
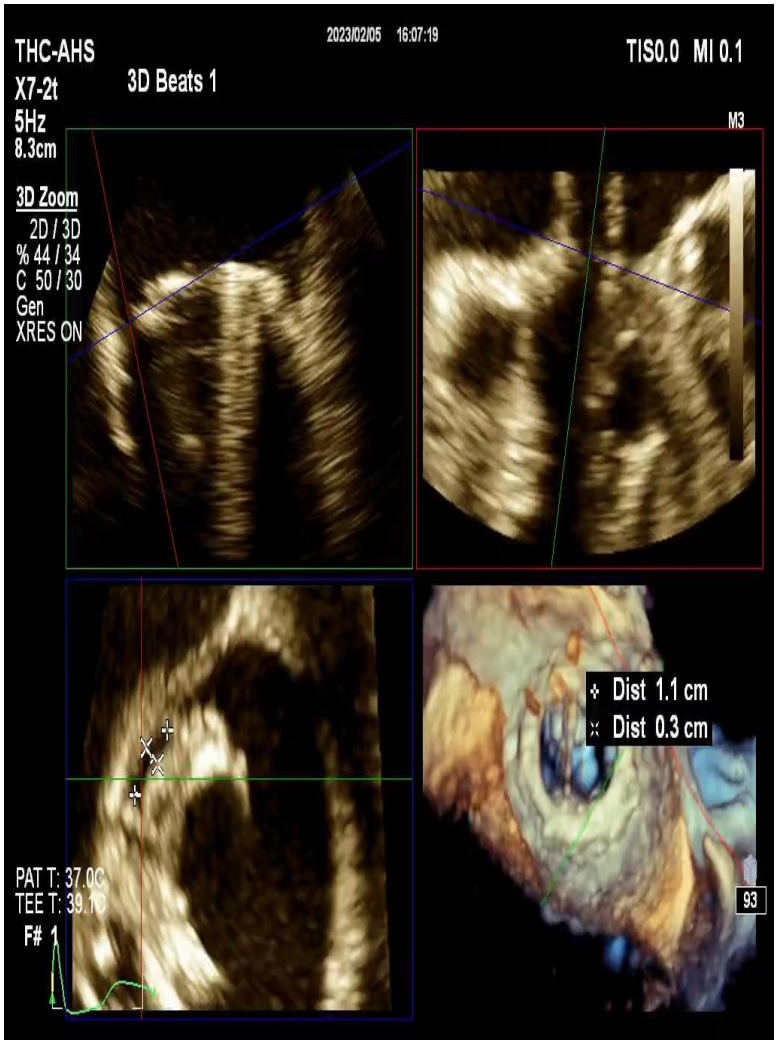
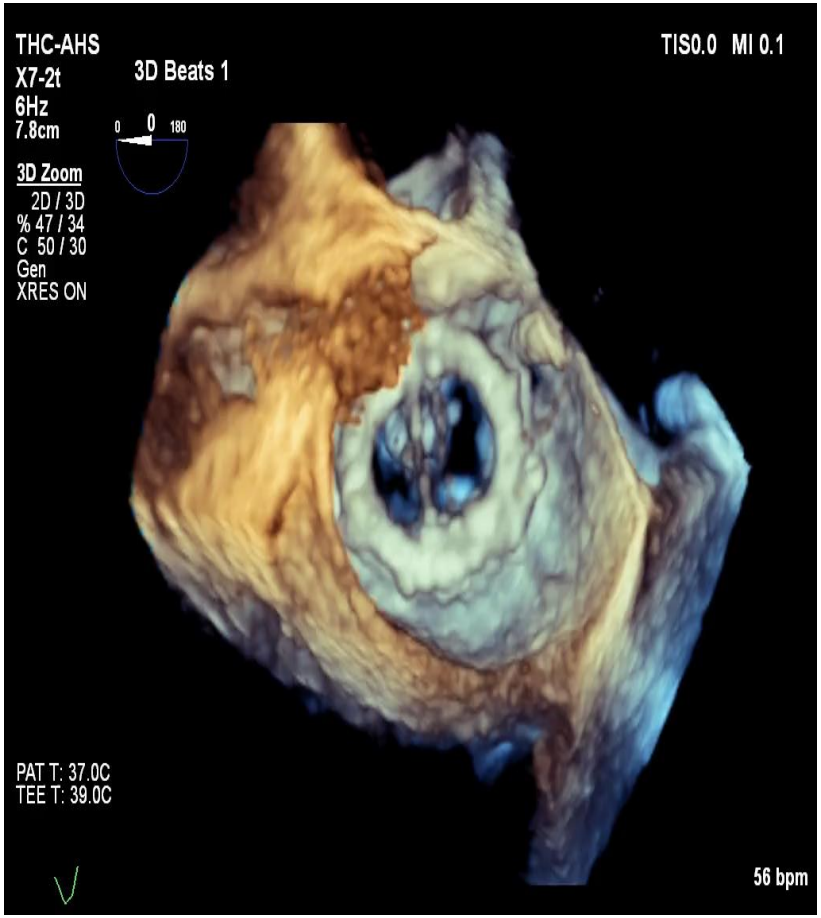


Figure 14. Management of prosthetic valve stenosis and regurgitation.
Colors correspond to Table 2. 3D indicates 3-dimensional; 4D, 4-dimensional; CT, computed tomography; CVC, Comprehensive Valve Center; HF, heart failure; TEE, transesophageal echocardiography; TTE, transthoracic echocardiography/echocardiogram; and ViV, valve-in-valve.
*See Figure 13 if valve thrombosis is suspected.

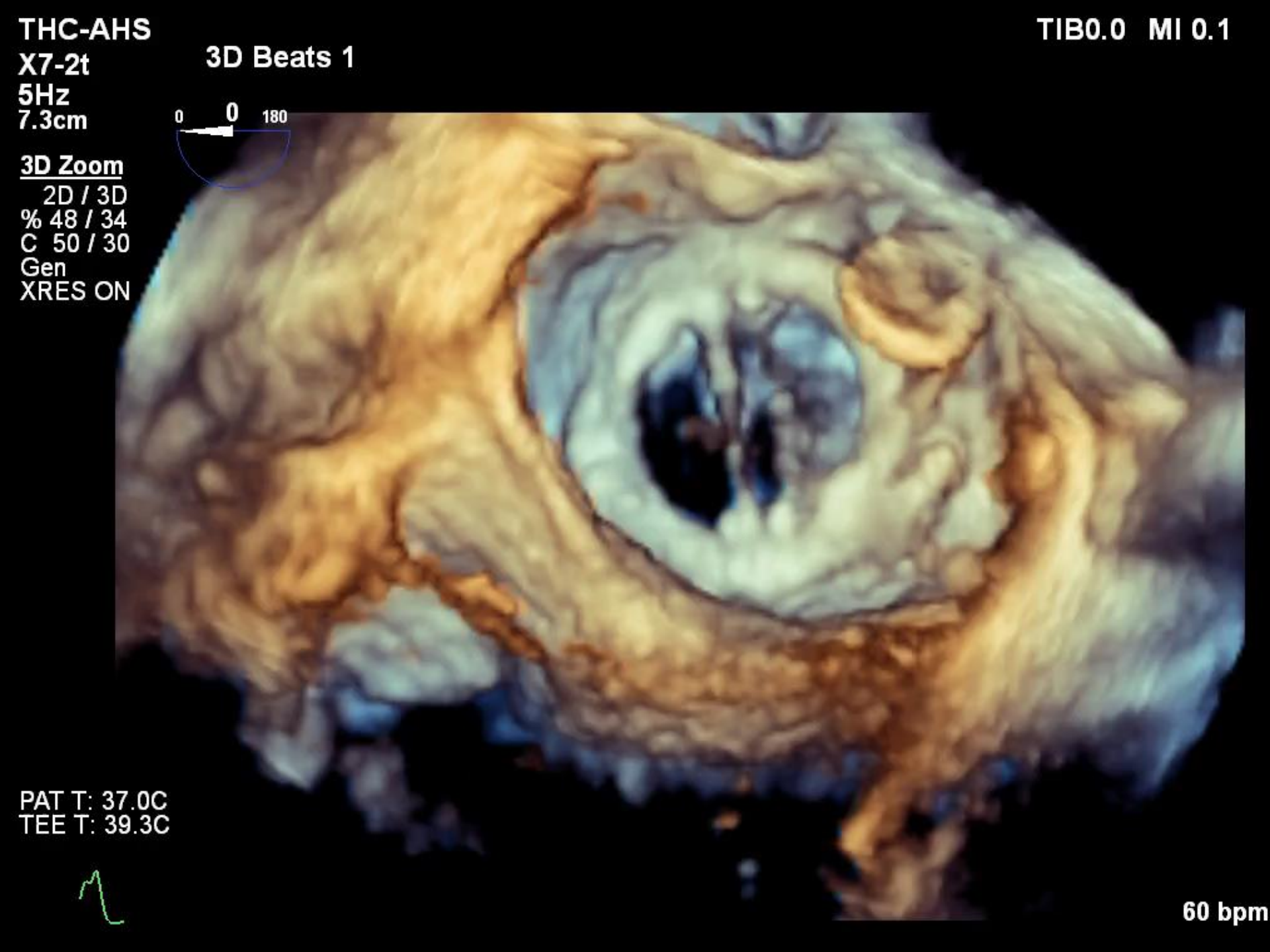
- A72 years old woman with hx of redo MVR and DOE FCIII-IV and high Euroscore, multiple comorbidities


THC-AHS
X7-2t
20Hz
10cm
TIS0.7 MI 0.4
2D
57%
C 50
P Off
Gen
CF
48%
6584Hz
WF 592Hz
4.4MHz
M3 M4
+57.1
-57.1
cm/s
PAT T: 37.0C
TEE T: 38.5C
*** bpm


THC-AHS
X7-2t
5Hz
8.3cm
2023/02/05 16:07:19
3D Beats 1
TIS0.0 MI 0.1
3D Zoom
2D / 3D
% 44 / 34
C 50 / 30
Gen
XRES ON
M3
Dist 1.1 cm
Dist 0.3 cm
PAT T: 37.0C
F# 1


THC-AHS
X7-2t
6Hz
7.8cm
3D Beats 1
TIS0.0 MI 0.1
0 0 180
3D Zoom
2D / 3D
% 47 / 34
C 50 / 30
Gen
XRES ON
PAT T: 37.0C
TEE T: 39.0C
56 bpm


THC-AHS
X7-2t
5Hz
7.3cm
3D Beats 1
TIS0.0 MI 0.1
0 55 180
3D Zoom
2D / 3D
% 52 / 33
C 50 / 30
Gen
XRES ON
PAT T: 37.0C
TEE T: 38.8C
64 bpm


THC-AHS
X7-2t
5Hz
7.3cm
3D Beats 1
TIB0.0 MI 0.1
0 0 180
3D Zoom
2D / 3D
% 48 / 34
C 50 / 30
Gen
XRES ON
PAT T: 37.0C
TEE T: 39.3C
60 bpm

PARAVALVULAR LEAKAGE

- R/O ENDOCARDITIS
- SYMTOM PRESENTATION: CHF / HEMOLYSIS

- R/O ENDOCARDIRIS(NEW PVL)
- HEART TEAM: PVL DEVICE CLOSURE

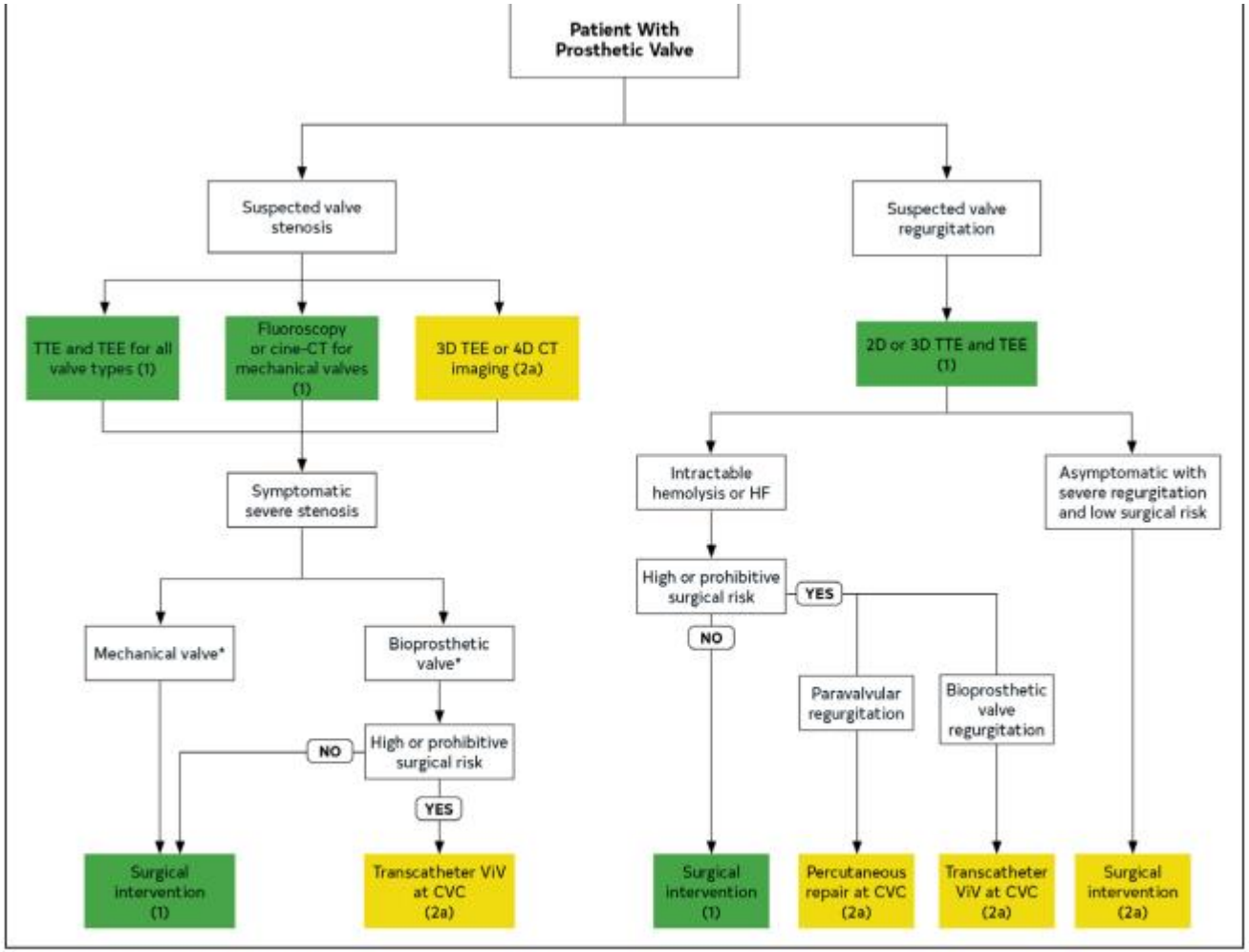
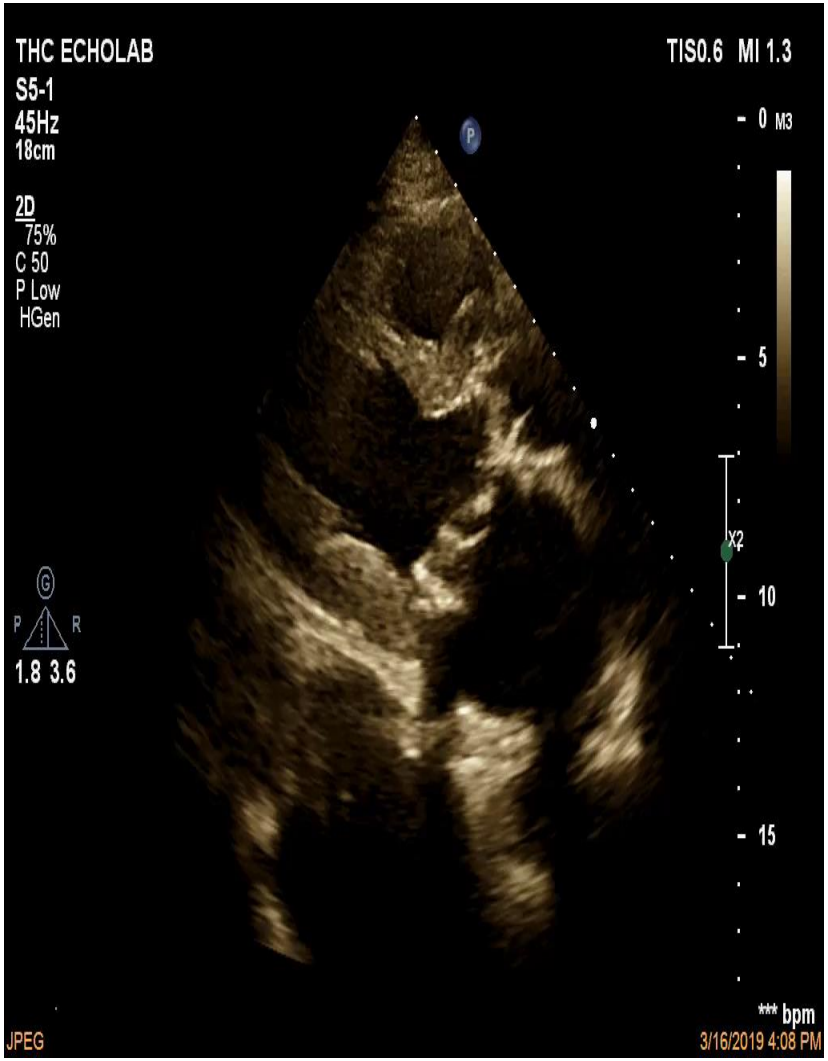
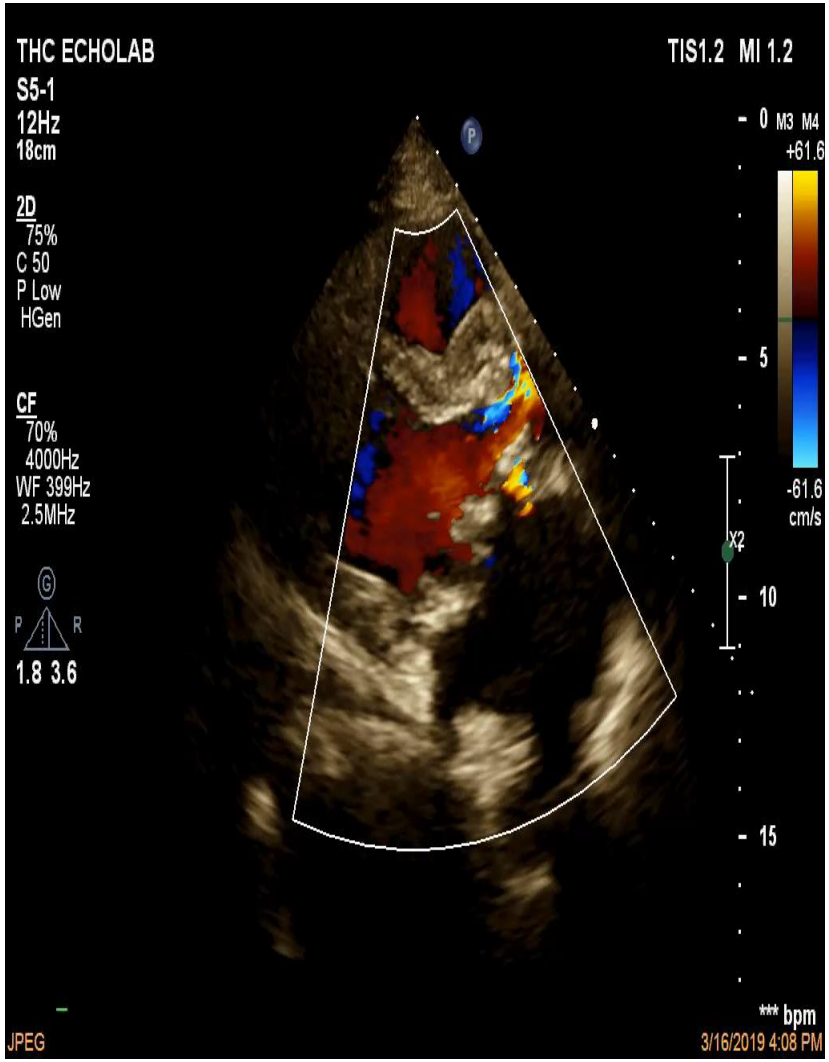
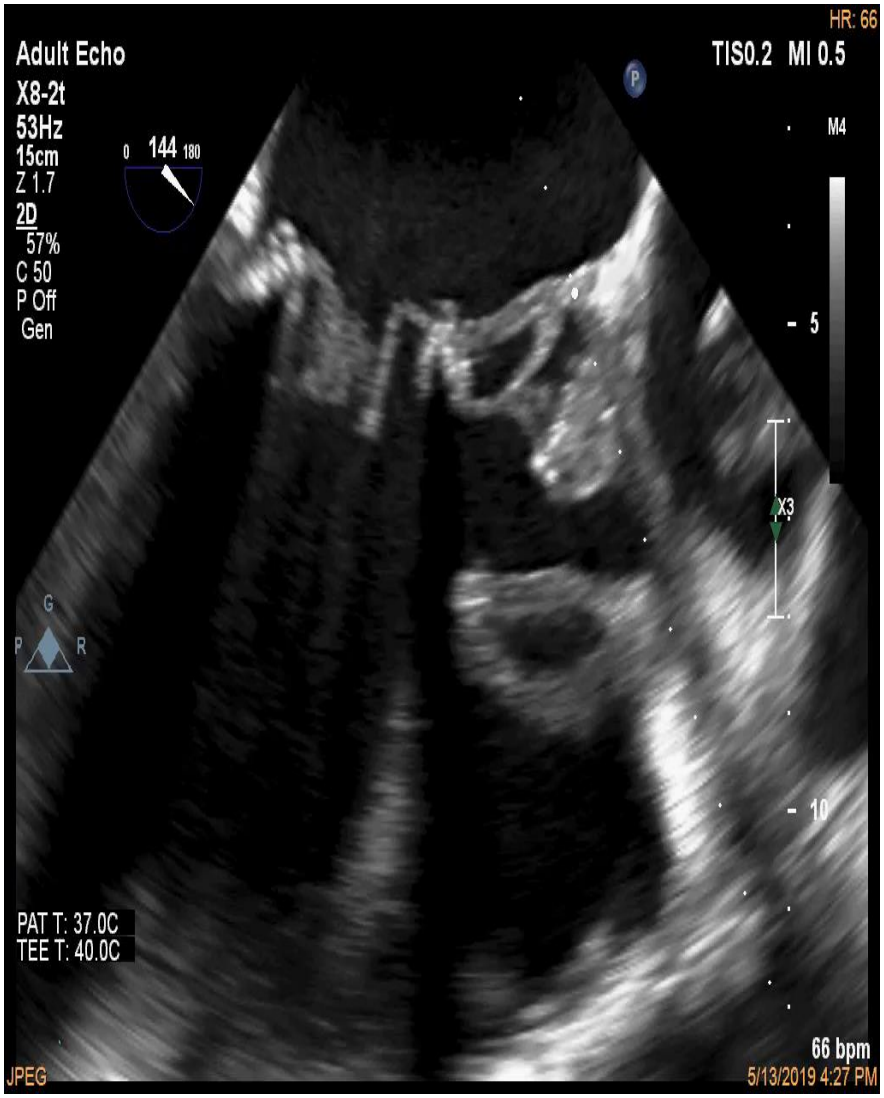


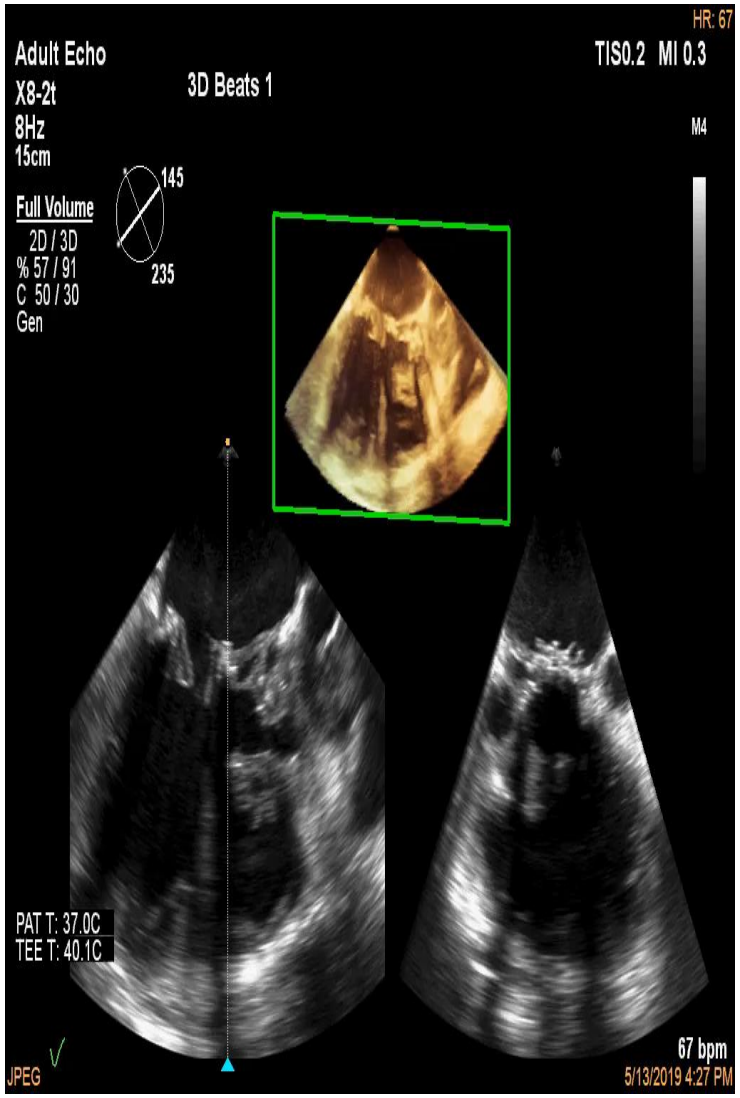
Figure 14. Management of prosthetic valve stenosis and regurgitation.
Colors correspond to Table 2. 3D indicates 3-dimensional; 4D, 4-dimensional; CT, computed tomography; CVC, Comprehensive Valve Center; HF, heart failure; TEE, transesophageal echocardiography; TTE, transthoracic echocardiography/echocardiogram; and ViV, valve-in-valve.
*See Figure 13 if valve thrombosis is suspected.

- A 55 years old man MVR+AVR bio with hx of thrombocytopenia and weakness and fever

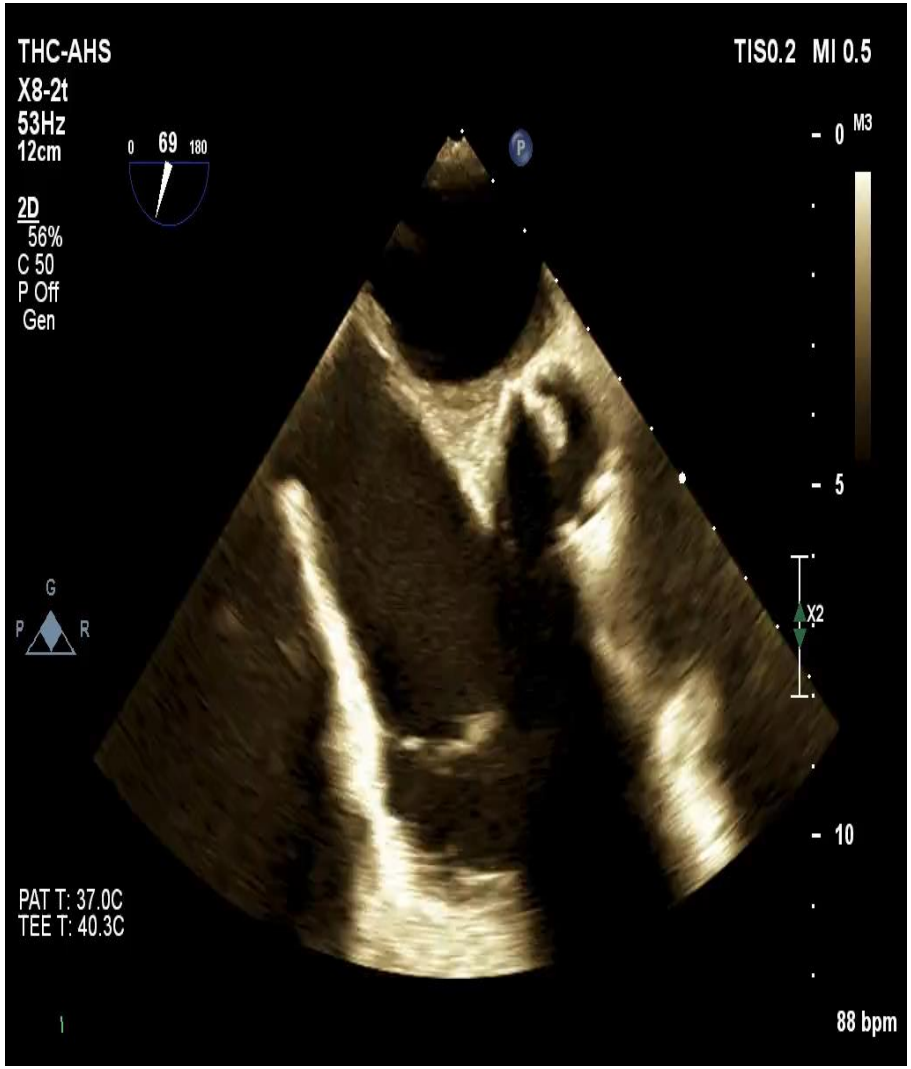

THC ECHOLAB
TIS0.6 MI 1.3
S5-1
45Hz
18cm
2D
75%
C 50
P Low
HGen
0 M3
5
10
15
X2
1.8 3.6
*** bpm
JPEG
3/16/2019 4:08 PM


THC ECHOLAB
TIS1.2 MI 1.2
S5-1
12Hz
18cm
2D
75%
C 50
P Low
HGen
CF
70%
4000Hz
WF 399Hz
2.5MHz
0 M3 M4
+61.6
-61.6
cm/s
5
10
15
X2
1.8 3.6
*** bpm
JPEG
3/16/2019 4:08 PM

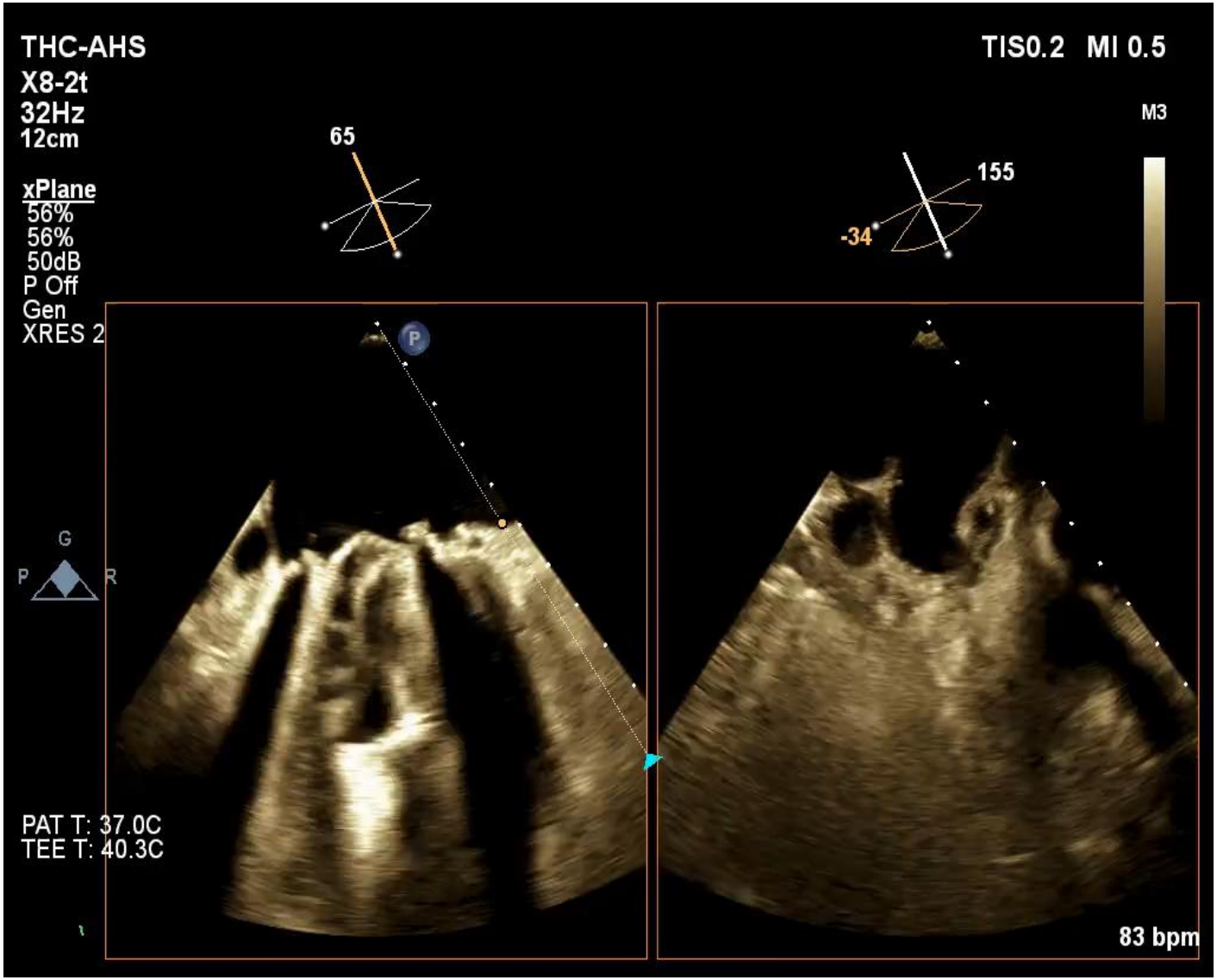

HR: 66
Adult Echo
TIS0.2 MI 0.5
X8-2t
53Hz
15cm
Z 1.7
2D
57%
C 50
P Off
Gen
0 144 180
M4
- 5
X3
- 10
G
P
R
PAT T: 37.0C
TEE T: 40.0C
66 bpm
JPEG
5/13/2019 4:27 PM

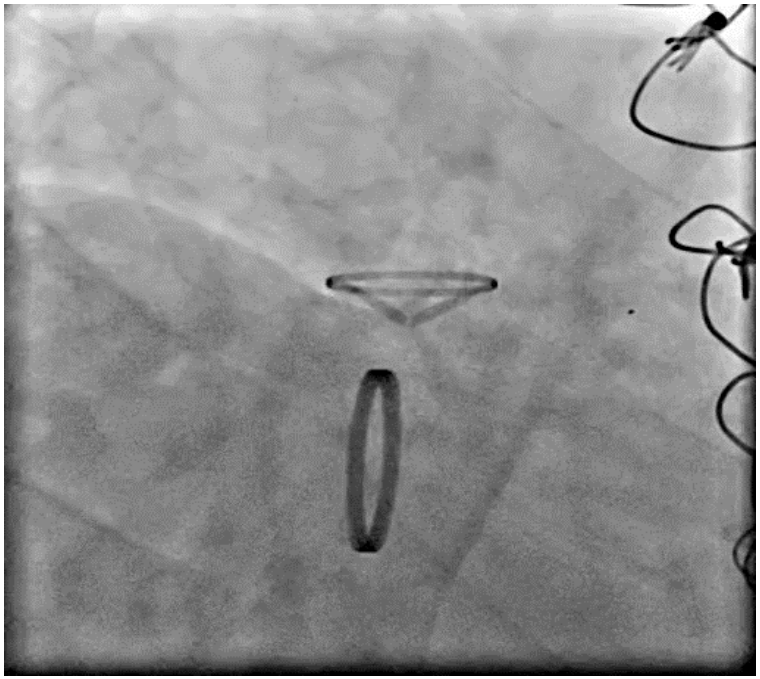

HR: 67
Adult Echo
3D Beats 1
TIS0.2 MI 0.3
X8-2t
8Hz
15cm
Full Volume
2D / 3D
% 57 / 91
C 50 / 30
Gen
145
235
M4
PAT T: 37.0C
TEE T: 40.1C
67 bpm
JPEG
5/13/2019 4:27 PM

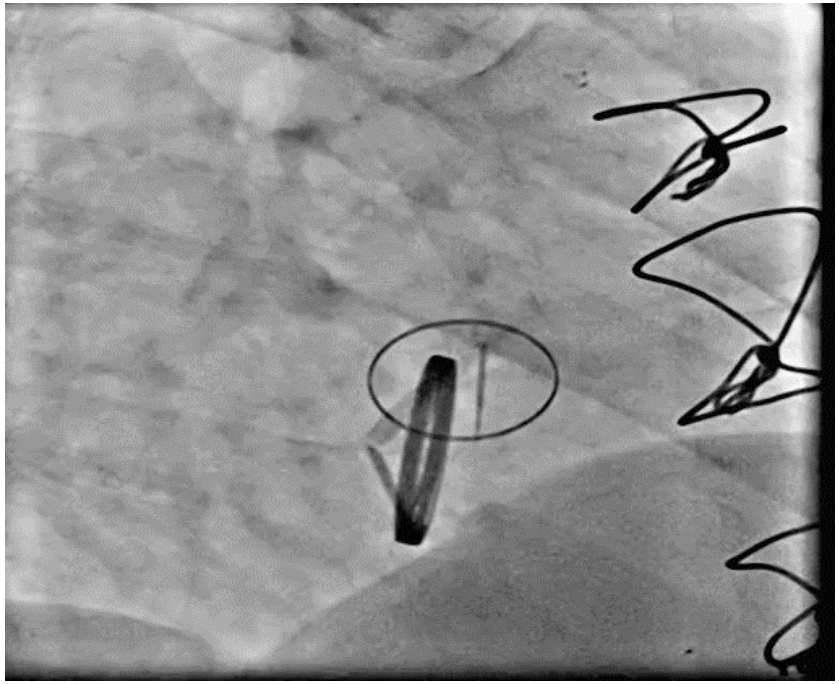
- A78 years old man with hx of redo AVR 5 years ago
- Brain tumor, COPD ,CRF , high EUROSCORE +STS score
- Surgery refused


THC-AHS
X8-2t
53Hz
12cm
2D
56%
C 50
P Off
Gen
TIS0.2 MI 0.5
0 69 180
M3
0
5
10
X2
G
P
R
PAT T: 37.0C
TEE T: 40.3C
88 bpm


THC-AHS
X8-2t
53Hz
12cm
2D
56%
C 50
P Off
Gen
TIS0.2 MI 0.5
0 119 180
M3
0
5
10
X2
G
P
R
PAT T: 37.0C
TEE T: 40.5C
83 bpm


THC-AHS
X8-2t
32Hz
12cm
xPlane
56%
56%
50dB
P Off
Gen
XRES 2
TIS0.2 MI 0.5
M3
65
155
-34
G
P
R
PAT T: 37.0C
TEE T: 40.3C
83 bpm





- Heart team
- Fibrinolytic contraindication
- Surgery refused
- What do you do?

- No option
- Cardiogenic shock bridge to surgery
- Mechanical thrombectomy(bail out)
- thromboaspiration

Case Report

Case report: Percutaneous Intervention for a Mechanical Prosthetic Valve Thrombosis as a Bailout procedure

Veena Nanjappa [a,*], Hema Raveesh [a], K.S. Sadanand [a], C.N. Manjunath [b]

[a] Sri Jayadeva Institute of Cardiovascular Sciences and Research, Mysore, India
[b] Sri Jayadeva Institute of Cardiovascular Sciences and Research, Bangalore, India

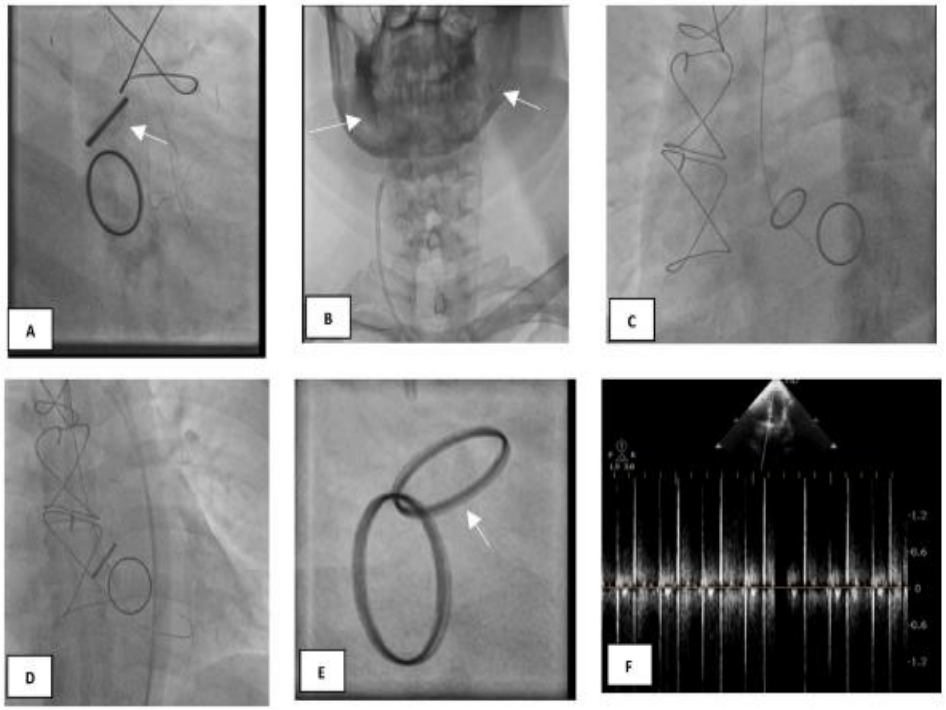
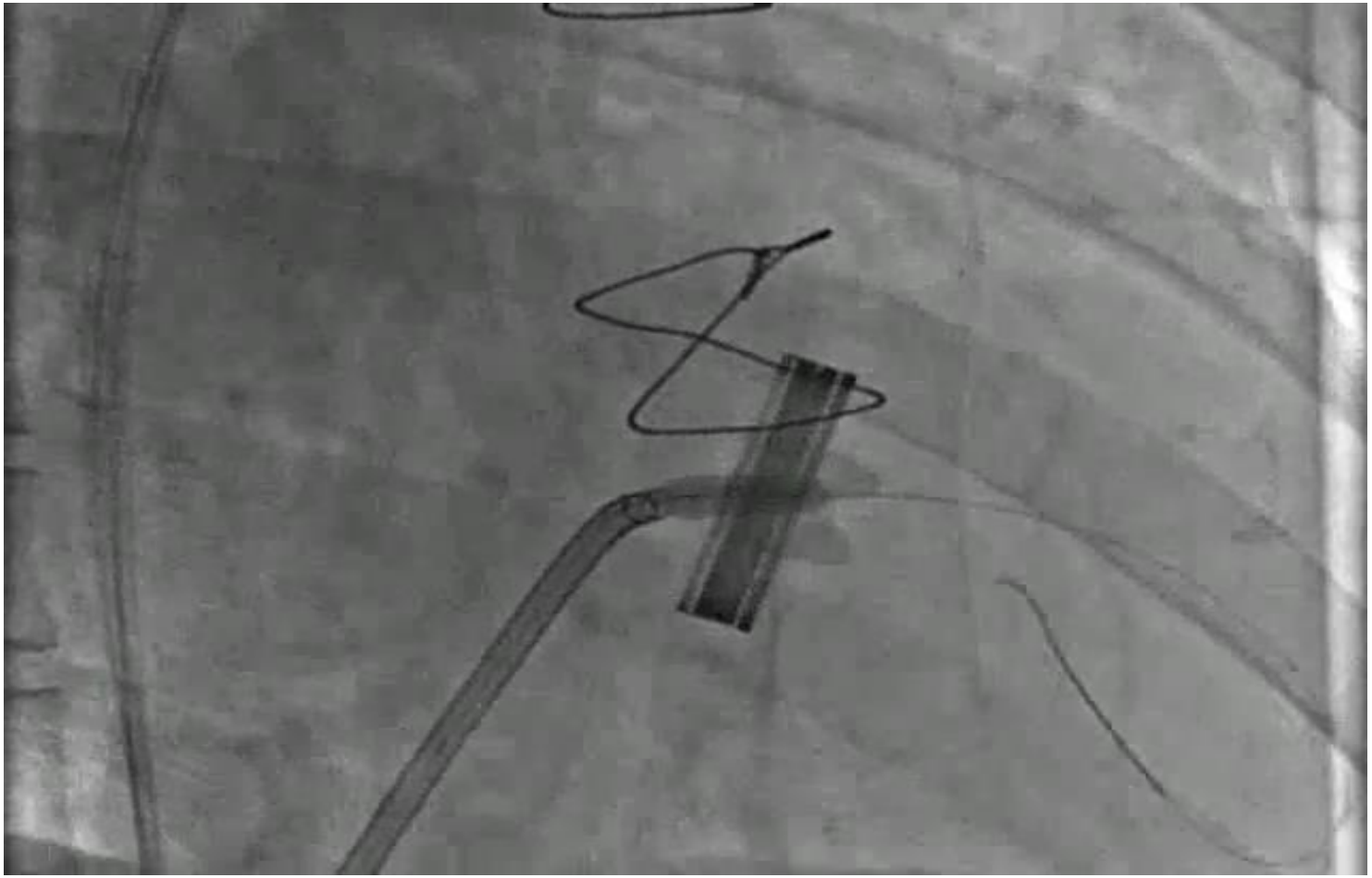
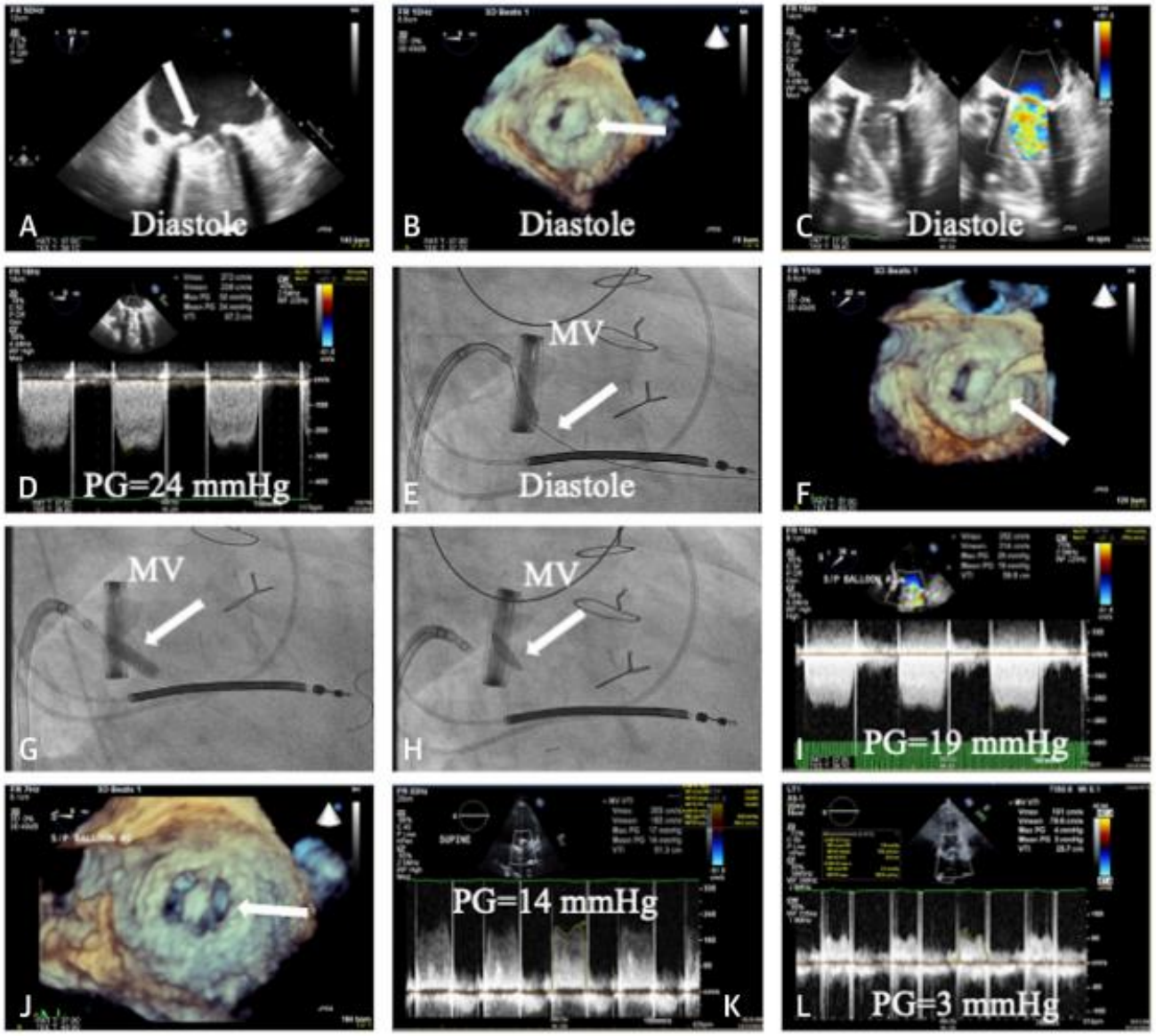


Fig. 1. Panel A-showing aortic and mitral prosthetic valves; Bileaflet Aortic valve is seen stuck in systole. Panel B- 6 mm Emboshield distal embolic protection device placed in bilateral internal carotid arteries. Panel C- 0.025"Terumo crossing the valve. Panel D- Dottering with 6 × 18 mm Tyshak Balloon. Panel E–opened position of leaflets in systole. Panel F- Gradients reduced on transthoracic echocardiogram.

release of a stuck mechanical mitral valve leaflet by serial balloon dilatations from 1-mm to 5-mm coronary balloons.





A woman with a 29-mm Carbomedics mitral mechanical prosthesis (Corcym) presented in cardiogenic shock. Three-dimensional transesophageal echocardiogram revealed a restricted leaflet **(A, B)** (**arrows** indicate leaflet), turbulent flows **(C),** elevated pressure gradient (PG) **(D),** and maximum transvalvular velocity of 2.7 m/s. Given her prohibitive surgical risk and supratherapeutic international normalized ratio, transcatheter leaflet release was attempted. Using fluoroscopy, the valve was crossed with a 0.014-inch guidewire via transseptal approach **(E, F)** (**arrows** indicate catheter crossing valve). Progressively larger noncompliant coronary balloons were inflated **(G)** (**arrow** indicates inflated balloon), which released the leaflet **(H)** (**arrow** indicates mobile leaflet), decreased the mitral PG **(I),** and mobilized the restricted leaflet **(J).** Mitral PG **(K, L)** improved before discharge. MV = mitral valve.

Check for updates

OPEN ACCESS

EDITED BY
Eustaquio Maria Onorato,
Ospedale Galeazzi - Sant'Ambrogio, Istituto di Ricovero e Cura a Carattere Scientifico (IRCCS), Italy

REVIEWED BY
Andrea Colli,
University of Pisa, Italy
Igor Buzaev,
Bashkir State Medical University, Russia

*CORRESPONDENCE
Ziyad Gunga
ziyad.gunga@chuv.ch

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Thromboaspiration of a left-sided bioprosthetic valve thrombosis by a mini-access: the Lausanne novel procedure

Ziyad Gunga[1]*, Vladimir Rubimbura[2], Denise Oberson[2], Pierre Monney[2], Xavier Bechtold[3], Zied Ltaief[4], Valentina Rancati[4], Eric Eeckhout[2] and Matthias Kirsch[1]

[1]Cardiac Surgery Department, Lausanne University Hospital (CHUV), Lausanne, Switzerland, [2]Cardiology Department, Lausanne University Hospital (CHUV), Lausanne, Switzerland, [3]Cardiovascular Perfusionist, Lausanne University Hospital (CHUV), Lausanne, Switzerland, [4]Anesthesiology Department, Lausanne University Hospital (CHUV), Lausanne, Switzerland

Left-sided bioprosthesis valve thrombosis (LSBVT) is a challenging complication necessitating invasive interventions. In this study, we introduce a novel, minimally invasive approach. We used a cerebral embolic protection system and an Occlutech cannula connected to an extracorporeal circuit, providing safer thrombus aspiration compared to the AngioVac system. This technique offers a promising alternative for high-risk patients with LSBVT.

KEYWORDS

valve thrombosis, bioprosthesis, cardiac surgery, complications, thrombus,

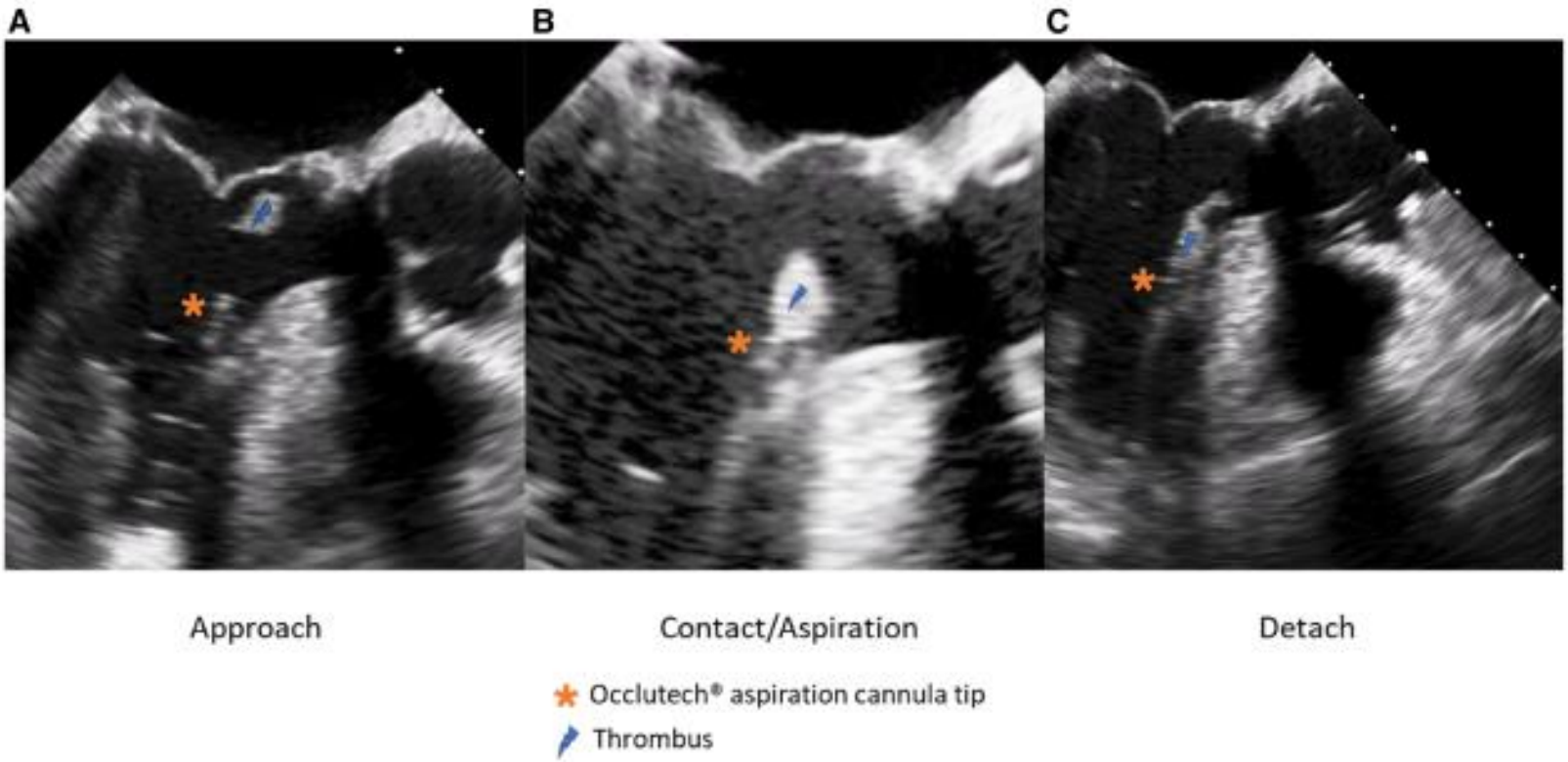


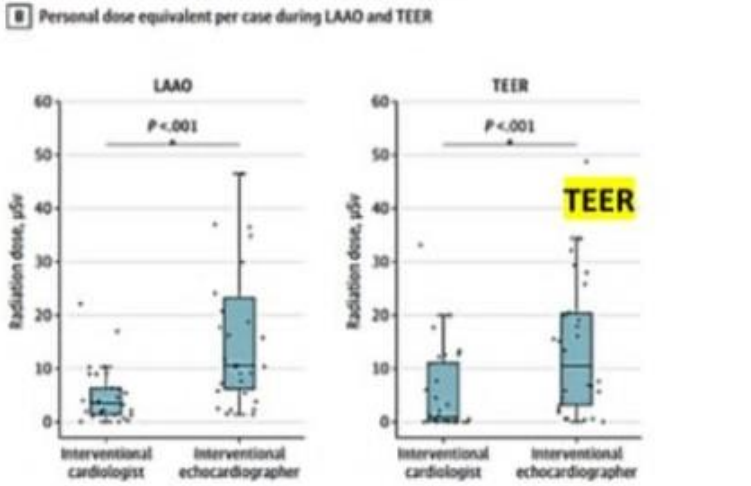
FIGURE 5
Echo-guided description of the thromboaspiration procedure in three steps (A–C).

1) ....Radiation hazards for imagers :

imagers 12x >> interventionalist

During TEER, interventional echocardiographers received a median personal dose equivalent of 10.5 µSv (IQR, 3.1-20.5 µSv).

This radiation dose was 11.7-fold higher than the median dose received by interventional cardiologists (0.9 µSv; IQR, 0.1-12.2 µSv; P < .001



logists, t the interventional cardiologist and interventional echocardiographer during percutaneous left atrial appendage occlusion (LAAO) (n = 30) and percutaneous transcatheter edge-to-edge mitral valve repair (TEER) (n = 30) are shown.