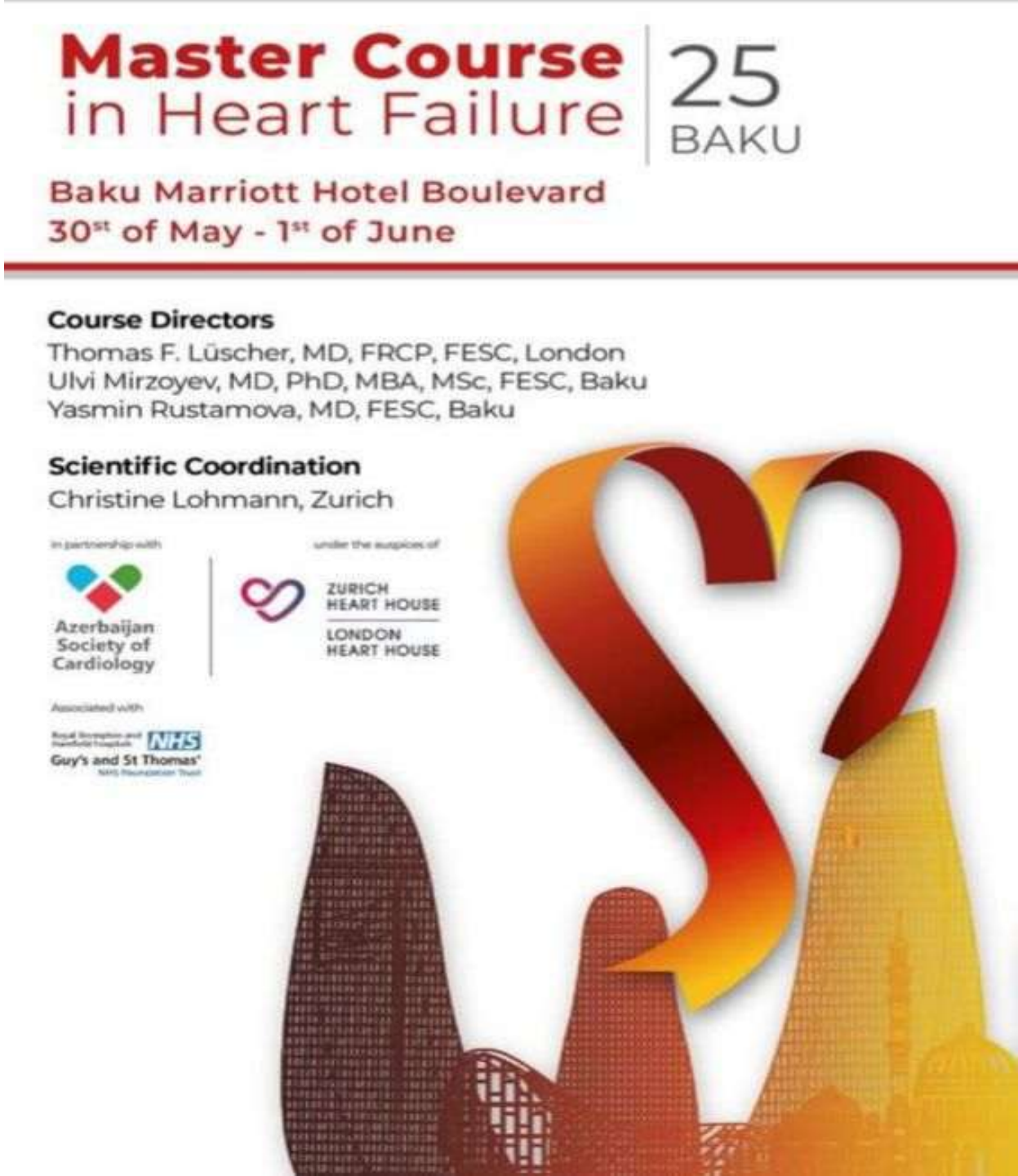
Aortic Stenosis in the Elderly: A Diagnosis which is not as it seems

Dr. Shafag Mustafayeva
Universal Hospital, Baku



Patient presentation

Patient: 80-year-old female

Initial Presentation (June 2024):
•Severe weakness and new-onset shortness of breath
•History of physical inactivity (spinal issues)

Medical History:
•Coronary artery disease (PCI 10 years ago)
•Arterial hypertension (renal artery stenting 6 years ago)
•Diabetes mellitus (10 years)
•Ischemic stroke (3 years ago)
•Paroxysmal atrial fibrillation

Patient presentation

Findings: (June 2024)
•↑ NT-proBNP
•Echo: LV hypertrophy, diastolic dysfunction, mild aortic stenosis

Diagnosis: HFpEF

Medications Initiated:
Candesartan 8 mg, Torasemide 10 mg, Bisoprolol 2.5 mg, Empagliflozin 10 mg, Rivaroxaban 20 mg, Rosuvastatin 20 mg

Follow-Up (March 2025):
Admitted with worsening weakness, shortness of breath on minimal exertion (NYHA class III), and palpitations (1 week)

Physical Examination

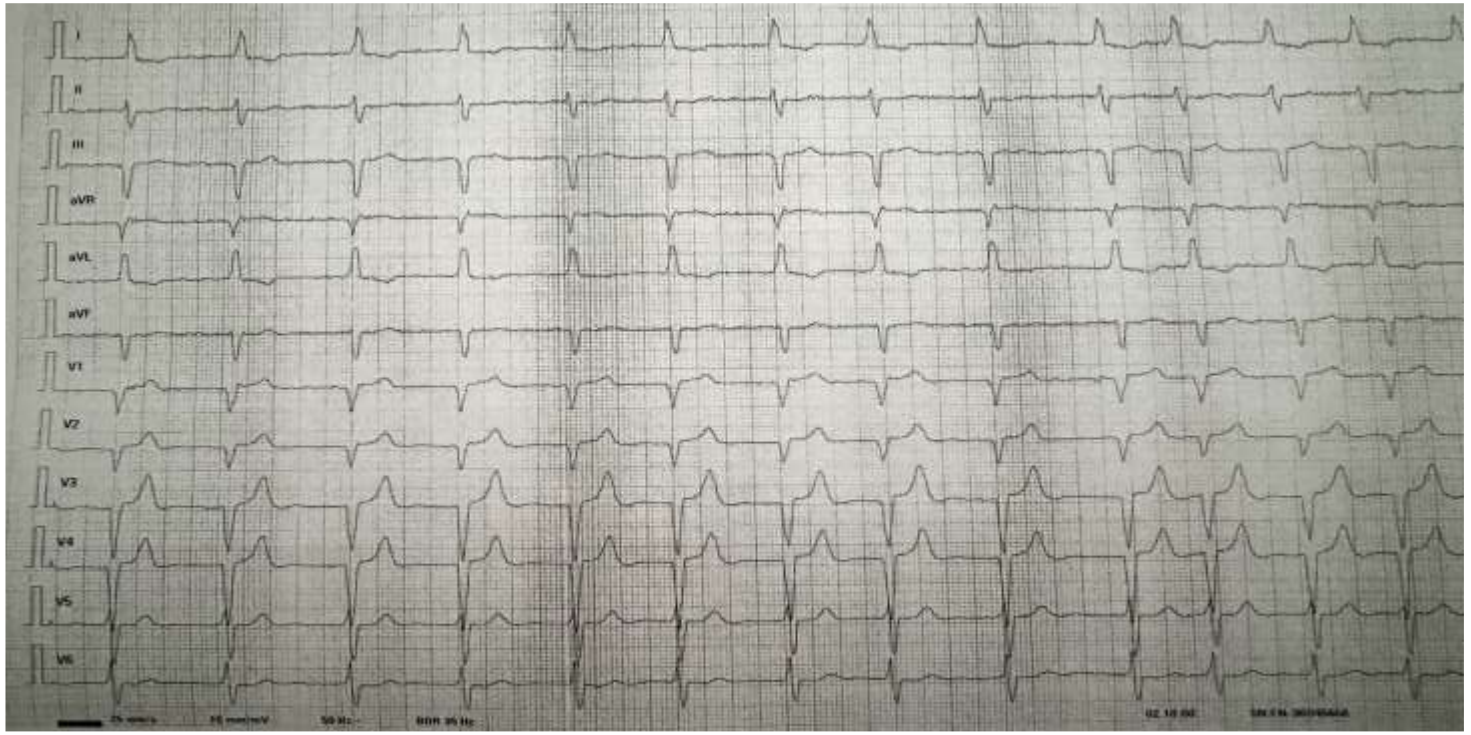
- Systolic murmur on the second right intercostal space
- BP 130/70mmHg, Pulse - irregular
- Mild peripheral edema
- Weight – 70kg, height 150cm , BMI – 31kg/m2
- BSA 1.7 m2

Initial work up

Blood test

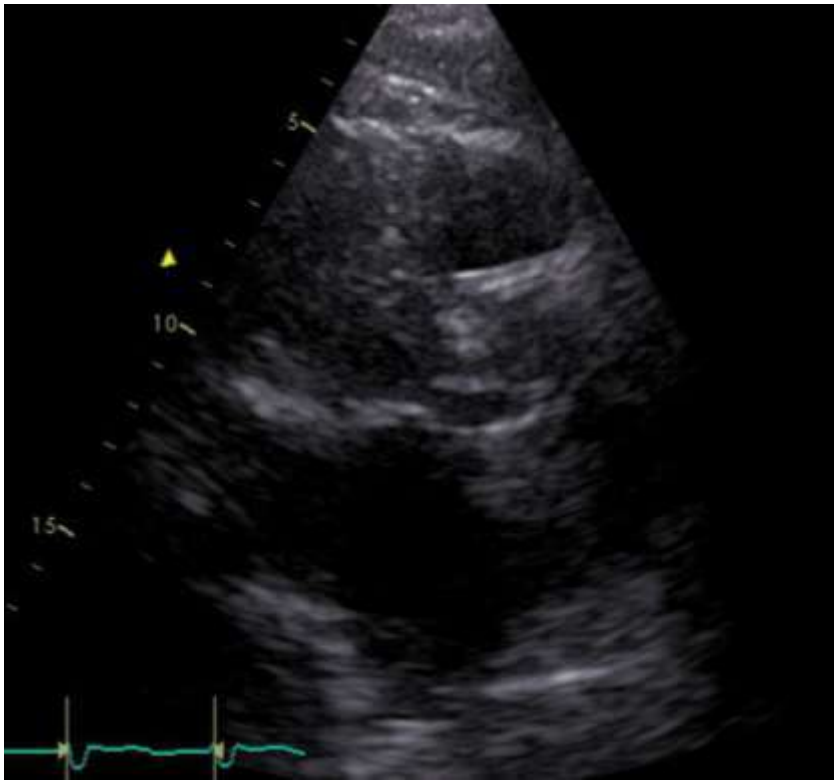
- Elevated **NT pro BNP - 12467 pg/ml**
- Elevated serum creatinine (0.95 mg/dL; normal <0.9) and HbA1C -8% (normal <5.7%)
- Complete Blood Count, Troponin I, serum electrolytes, serum albumin, TSH, LDL-cholesterol were in the **normal range.**

Electrocardiogram



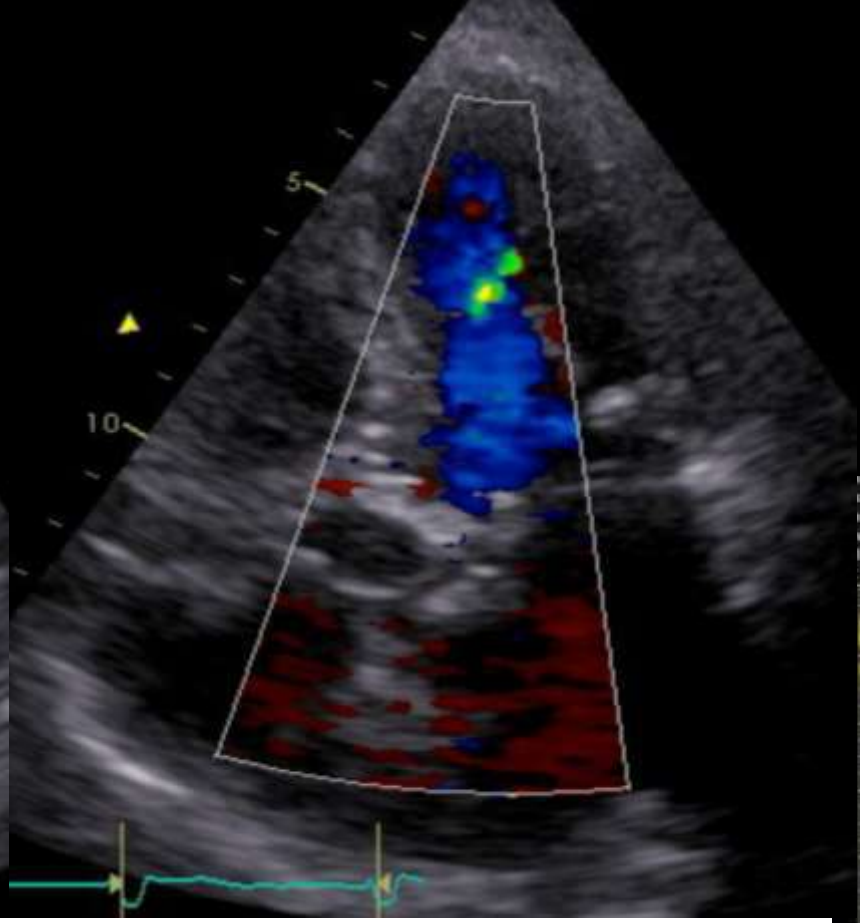
Initial work up

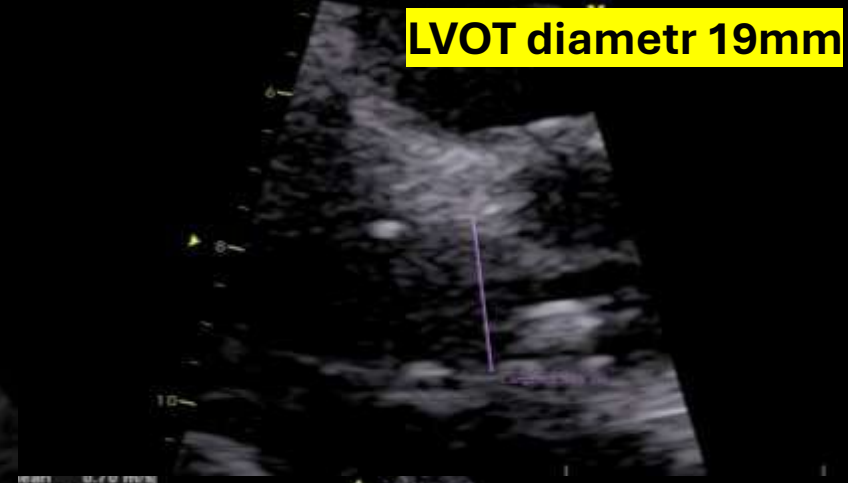
Transthoracic echocardiography

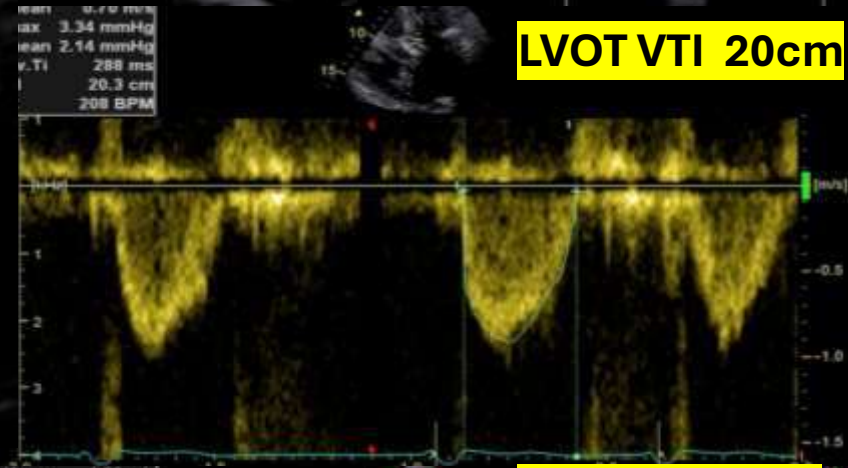


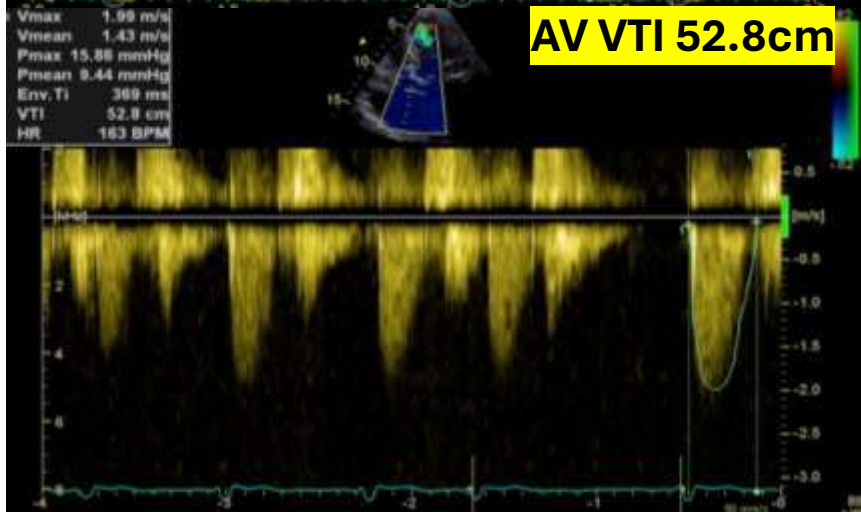
- Calcified AV with poor opening
- MAC (mild mitral stenosis)
- Severely elevated SPAP (55 mmHg).

LVEF 55%
LV hypertrophy
Biatrial enlargement (LAVI 48ml/m2, RA area 20cm2)









Aortic valve measurements:

- **Pmean 16mmHg**
- **AVA 1.0cm²**
- **AVAi 0.56cm² / m²**
- **SV index – 26ml/ m²**
- **LVEF 55%**

DISCORDANCE

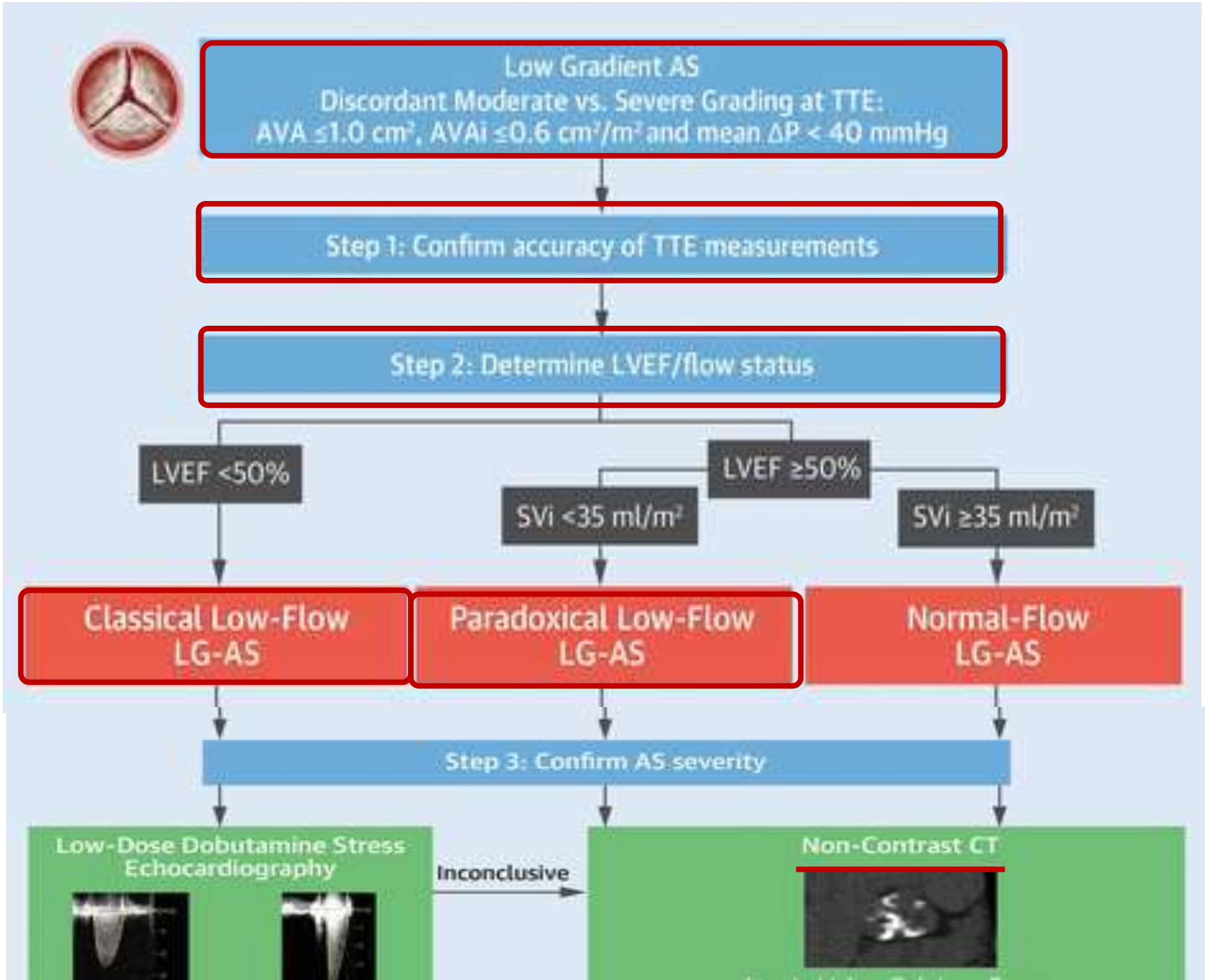
QUESTIONS ?

1. Is the aortic stenosis severe or not?

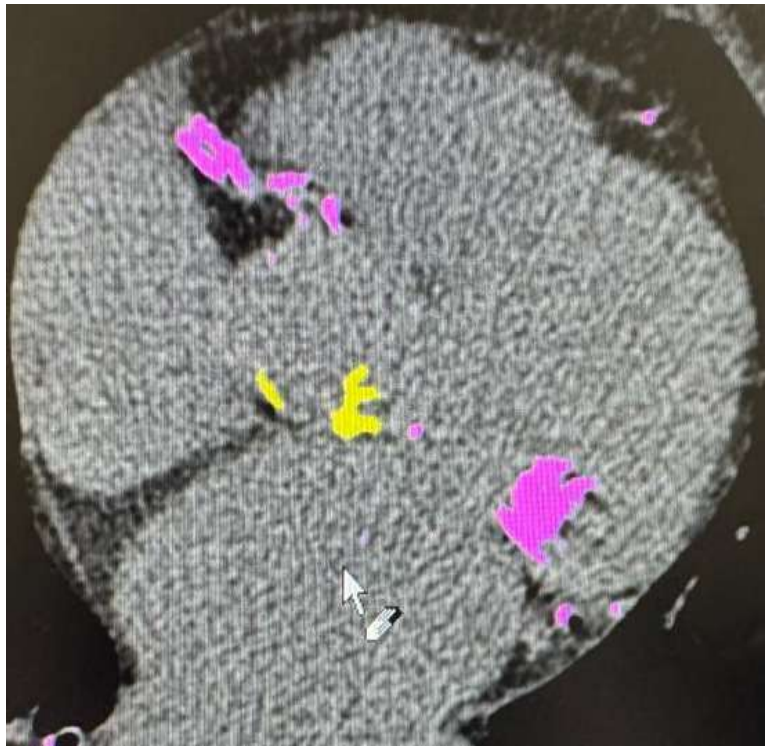
2. What is the further treatment strategy?

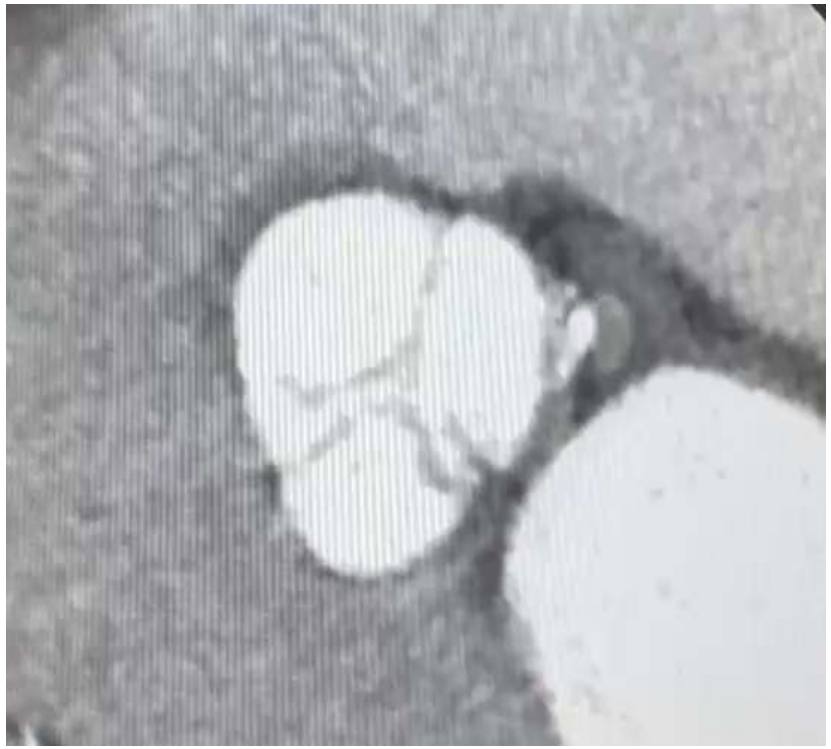
- **Pmean 16mmHg**
- **AVA 1.0cm²**
- **AVAi 0.56cm² / m²**
- **SV index – 26ml/ m²**
- **LVEF 55%**

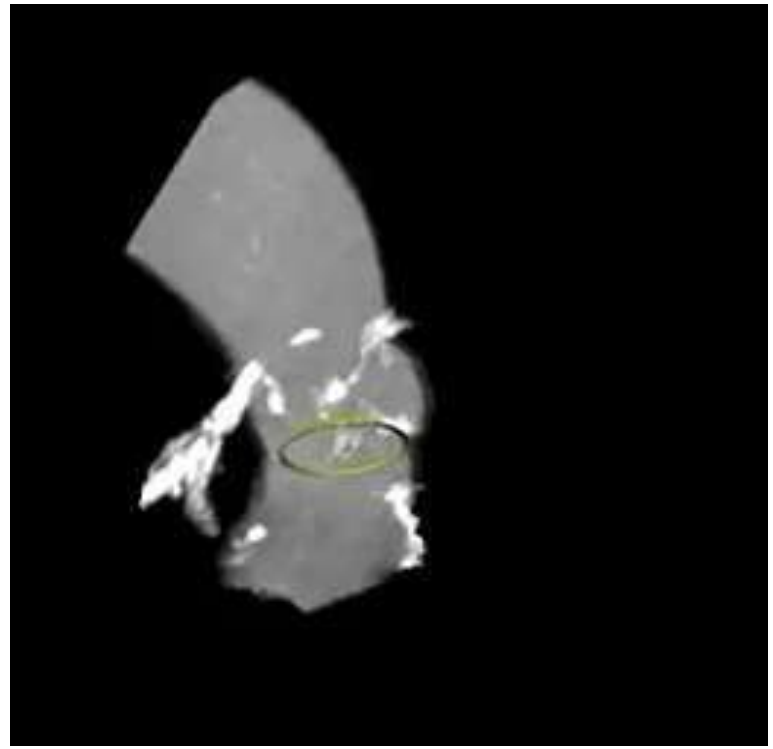
Paradoxal Low flow,
Low - gradient aortic stenosis



Cardiac CT







Aortic Valve Calcium Score 730AU

How should we interpret this value?

Diagnosis

According to current guidelines:

Our patient's **Ca score** was **730AU**, which is **NOT a severe stenosis.**

Medical therapy

SEVERE AS

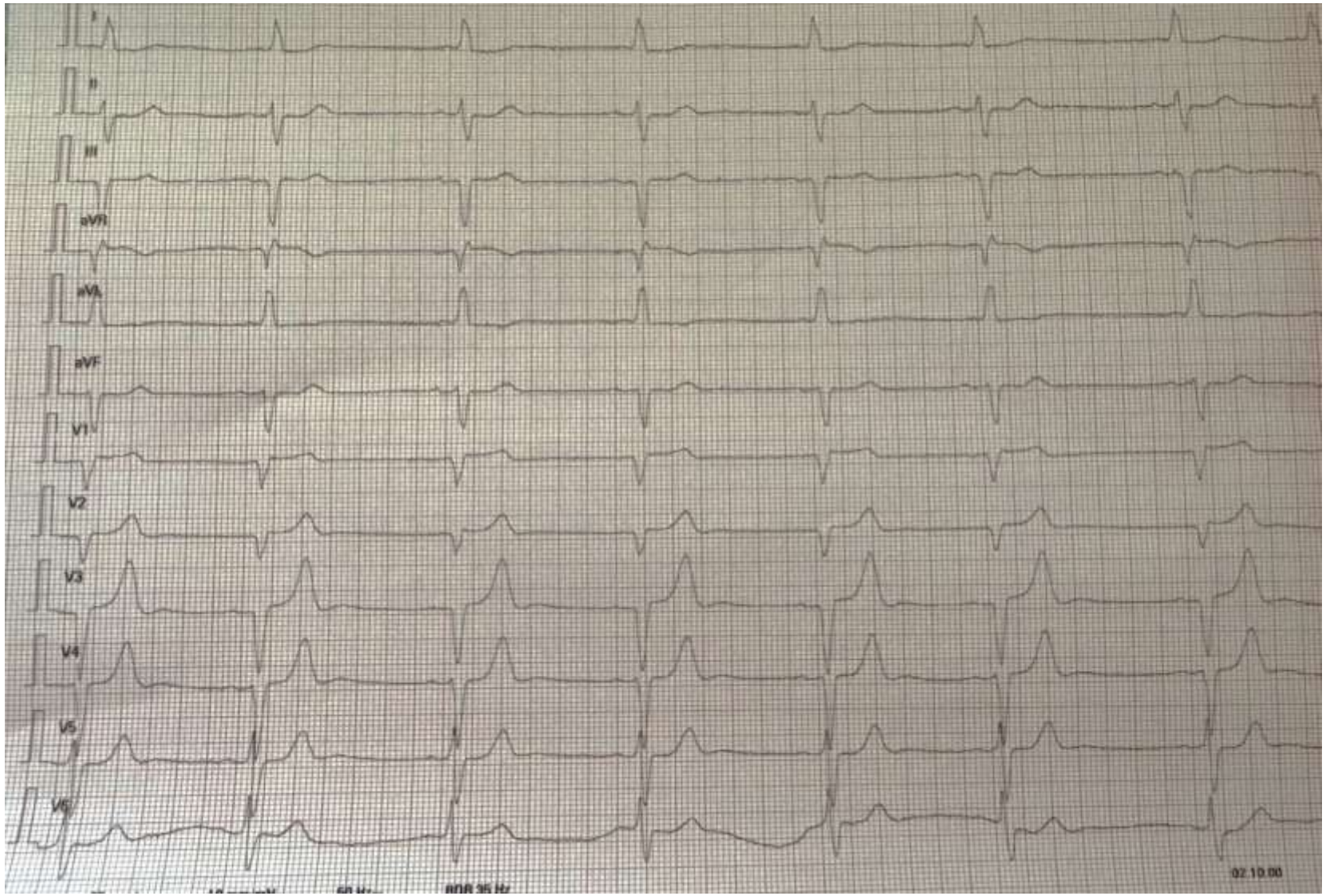
QUESTION

3. What is the cause of the deterioration in condition?

Atrial fibrillation

Management

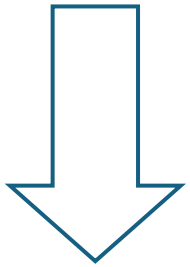
Electrical cardioversion was performed and sinus rhythm was restored



Follow up

Treatment:

- B-blocker was stopped and amiodarone was started (200mg /day)
- Continued treatment for heart failure (Candesartan 8mg, Furosemid 20mg, Spironolakton 50mg, Empagliflozin 10mg, Rivaroxaban 20mg, Rozuvastatin 20mg).

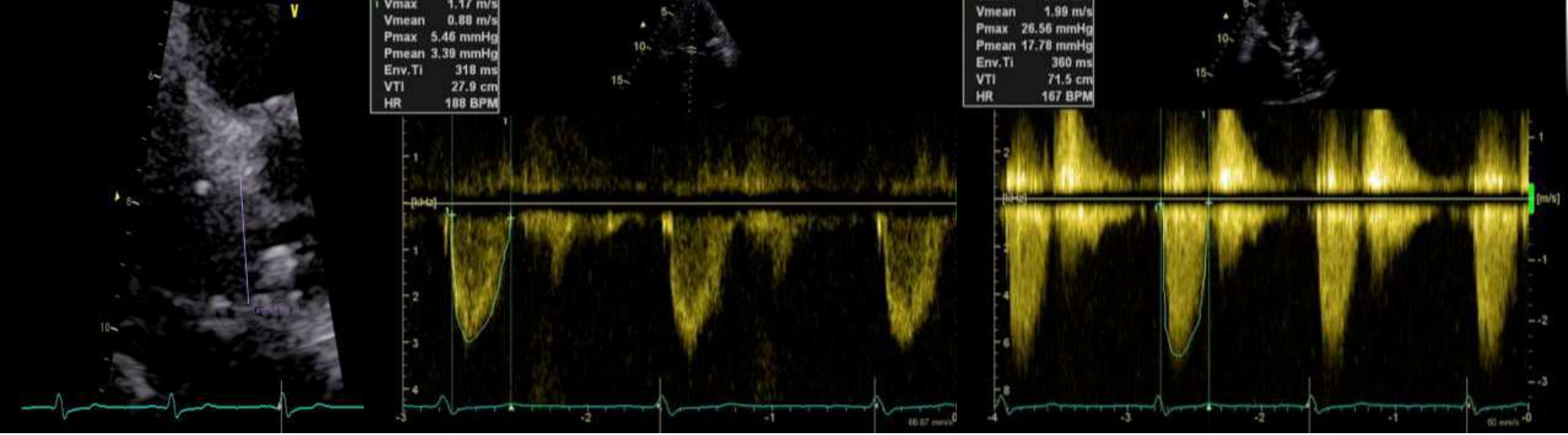


- **After a month of therapy, improvement was observed in patient's clinical status.**
- **Heart failure symptoms descreased to NYHA class II**
- **NT- pro BNP levels have significantly descreased (12467 pq/ml ⟶ 4150pq/ml)**

ECHO after a month

LVEF 55%
LV hypertrophy
Biatrial enlargement (LAVI 45ml/m2)

- AV is calcified
- MAC (mild mitral stenosis)
- Elevated SPAP (40 mmHg).

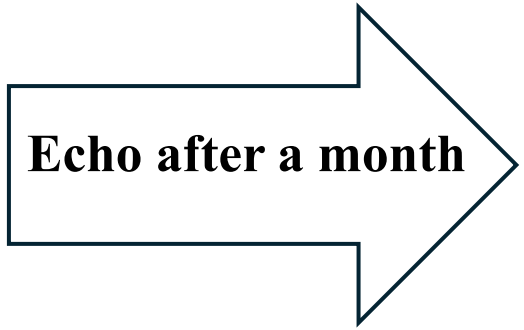


- **Pmean 18mmHg**
- **AVA 1.2cm²**
- **AVAi 0.7cm² / m²**
- **SV index – 51ml/m2**
- **LVEF 55%**

Normal –flow moderate aortic stenosis

Paradoxical Low flow, Low - gradient aortic stenosis

- **Pmean 16mmHg**
- **AVA 1.0cm^2**
- **AVAi 0.56cm^2 / m^2**
- **SV index – 26ml/ m^2**
- **LVEF 55%**



Normal –flow moderate aortic stenosis

- **Pmean 18mmHg**
- **AVA 1.2cm^2**
- **AVAi 0.7cm^2 / m^2**
- **SV index – 51ml/m2**
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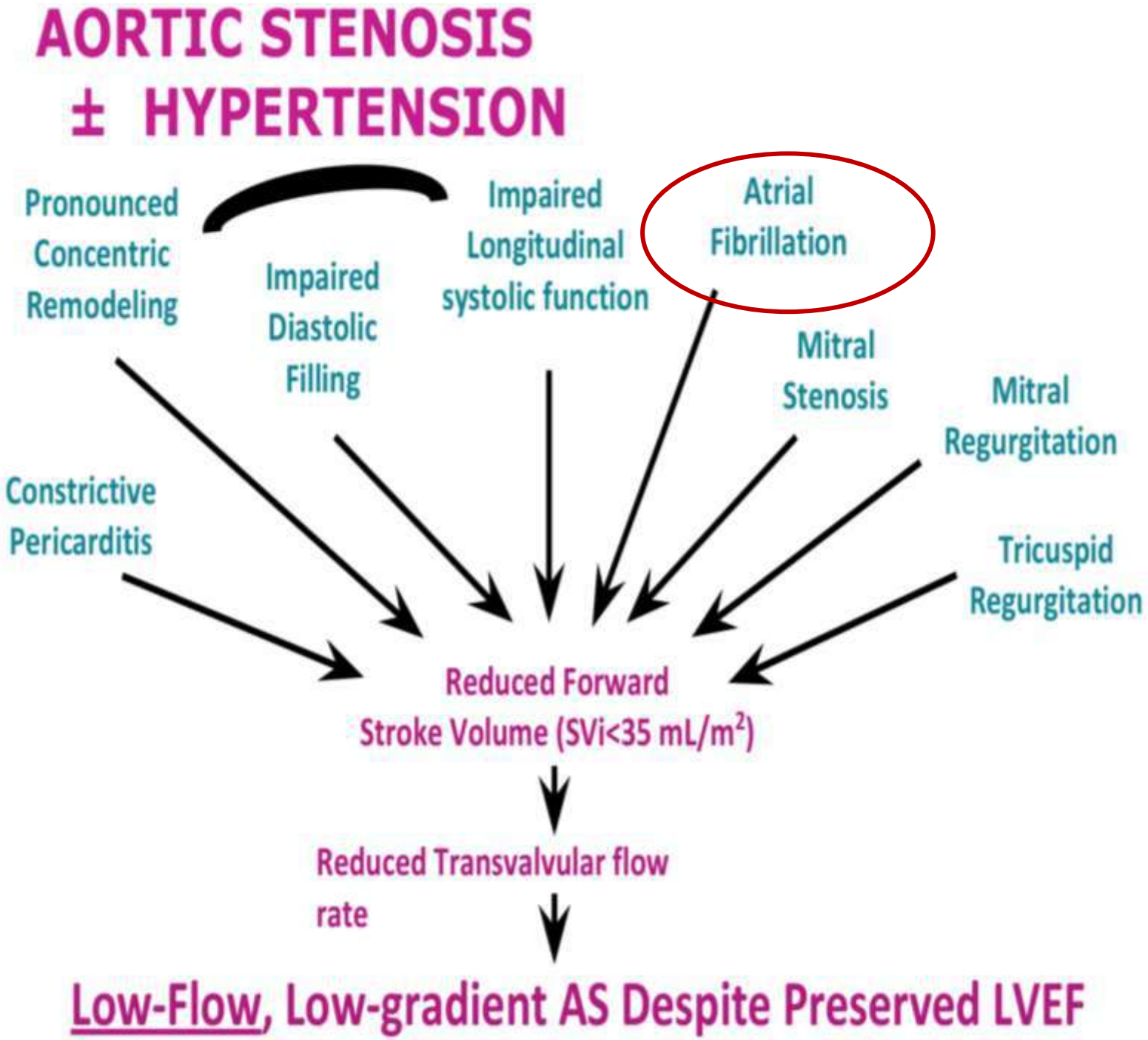
What explains these changes?



It is very important to remember that **additional conditions** such as atrial fibrillation, severe mitral stenosis, or mitral regurgitation may be present, which further **reduce stroke volume** and so lead to a **decrease in the mean transvalvular gradient**

TAKE HOME MESSAGES

- **In elderly patients with** significant **left ventricular hypertrophy** and preserved systolic function, it is important to consider the possibility **of paradoxical low-flow, low-gradient aortic stenosis**.

- **Paradoxical low-flow, low-gradient AS** is observed in approximately **15% of patients with AS** and is associated with a **poor prognosis**.

- It's important to consider other **conditions that can lower stroke volume**, such as LV hypertrophy, diastolic dysfunction, atrial fibrillation, and mitral stenosis.

- **AVR** improves outcomes in patients with **true severe paradoxical AS**.

- **AVR does not improve prognosis** in patients with **paradoxical pseudo-severe AS**, highlighting the importance of accurate differential diagnosis.

“The eye sees everything –
except what trully matters”

THANK YOU FOR YOUR ATTENTION