

The logo for the American Society of Transplantation (AST) features the letters 'AST' in a bold, white, sans-serif font. A vertical white line is positioned to the right of the letters, separating them from the full name of the organization.

AMERICAN SOCIETY OF  
TRANSPLANTATION

# Complicated MCS

**Trainee Name:** Mahwash Kassi

**Trainee Title:** Advanced Heart Failure Fellow

**Trainee Institution:** Mayo Clinic, Rochester

**Mentor Name:** Liviu Klein

**Mentor Title:** Associate Professor of Medicine

**Mentor Institution:** University of California  
San Francisco

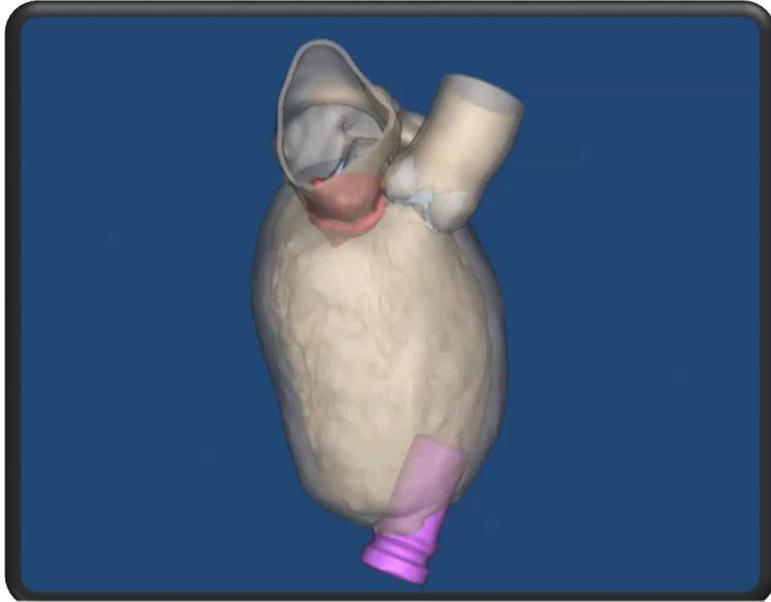


# Disclosures

Financial relationships  
&  
Off-label or investigational  
uses  
**(NONE)**



# Learning Objectives



- Trouble shooting with left ventricular assist devices (HM II LVAD)
- Role of imaging (Echocardiography, Cardiac CT)

# Case Presentation

## Reason for presentation: Rise in LDH

- A 77-year-old gentleman from Fall Creek Wisconsin with HMII LVAD as destination therapy presented to the hospital for rising LDH (baseline 822 → 1782).
- Notable history: Aortic valve replacement, Non-ischemic cardiomyopathy, h/o Ventricular tachycardia and End stage renal disease requiring hemodialysis.
- Month prior, LVAD speed was increased from 9000 RPM to 10,200 RPM for optimal unloading and improved cardiac output (RA 9, PA 20/10/12, PCPW 12, LVEDP 9)

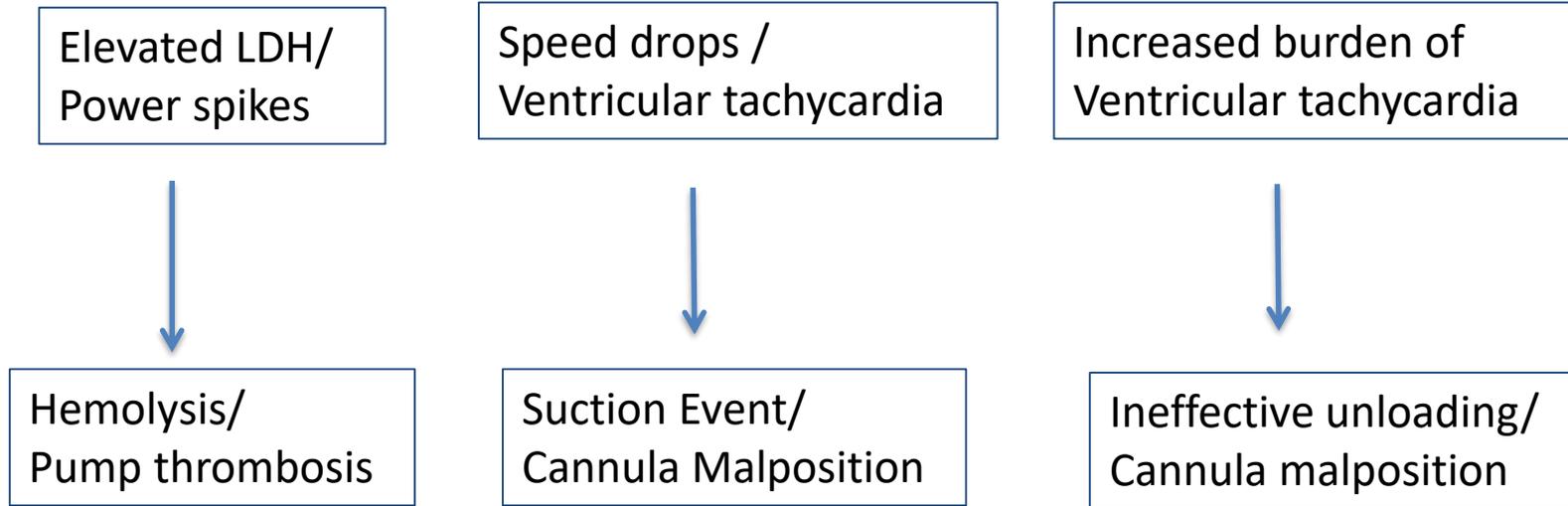
# Case Presentation

- Subsequent clinic visit was noted to have increased VT burden with 2 episodes of shock
- Patient had prior h/o hemolysis and was on dual antiplatelet therapy and warfarin without interruption.
- The patient had noted symptoms of increased fatigue, diaphoresis and shortness of breath. In addition he reported an odd “fluttering” sensation in his chest with changes in position.

# Case Presentation

- On physical examination he had normal JVP, a normal sounding LVAD hum and no peripheral edema.
- On taking deep breaths for chest examination he was noted to have “tapping sound” in his precordium. This was associated with runs of ventricular tachycardia (VT) on the monitor.
- The “tapping sound” with associated with VT became even more obvious on performing Valsalva maneuver and left lateral position.
- LVAD console showed Flow 5L/min, PI 4.5, Power 4 Watts with some power spikes (6-7 Watts) and speed drops (9400, 9600)

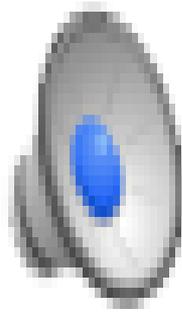
# Troubleshooting



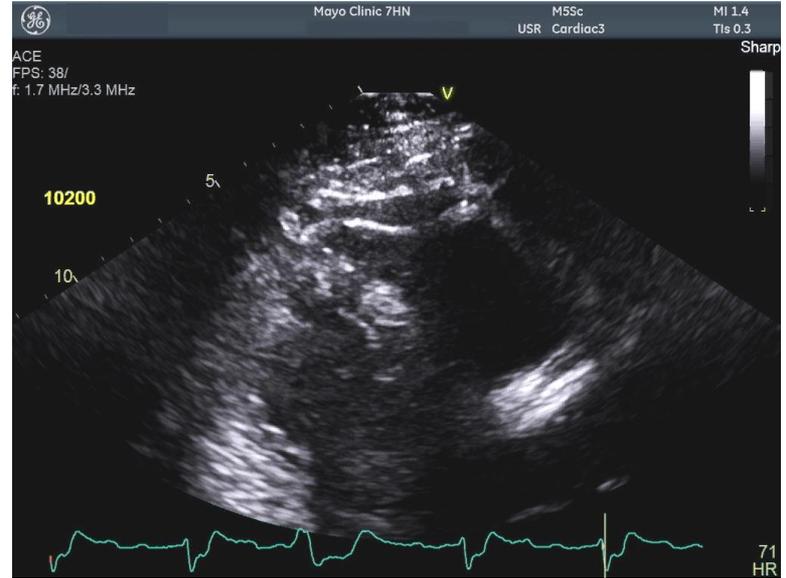
Is there a unifying diagnosis?

# Echocardiogram

Valsalva



Position change



**AST** | AMERICAN SOCIETY OF  
TRANSPLANTATION



CUTTING EDGE of TRANSPLANTATION

**TRANSPLANT SUMMIT 2018**

*Breaking Through Regulatory Barriers  
to Unleash Transplant Innovation*

FEBRUARY 8-10, 2018 • ARIZONA BILTMORE • PHOENIX, AZ

For more information, visit [www.myAST.org/meetings/CEOT](http://www.myAST.org/meetings/CEOT)

# Cardiac CT



**AST** | AMERICAN SOCIETY OF  
TRANSPLANTATION



CUTTING EDGE of TRANSPLANTATION

**TRANSPLANT SUMMIT 2018**

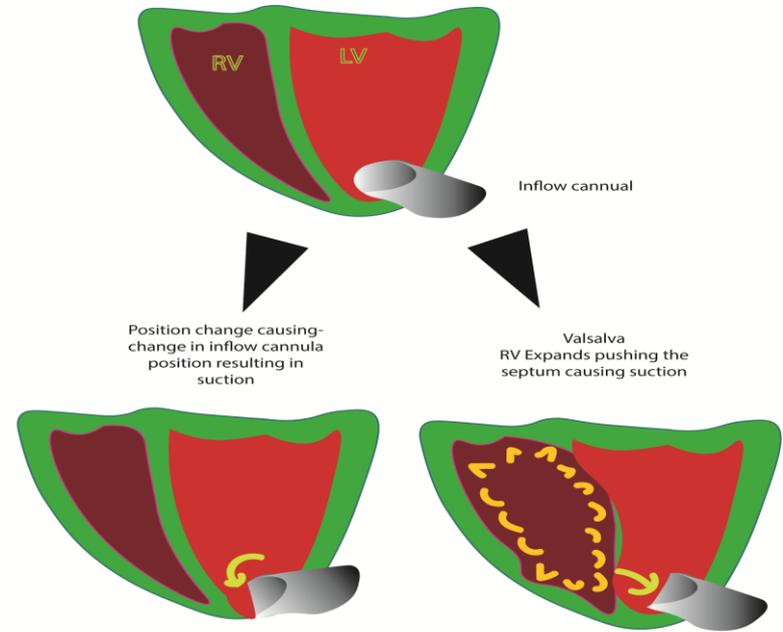
*Breaking Through Regulatory Barriers  
to Unleash Transplant Innovation*

FEBRUARY 8-10, 2018 • ARIZONA BILTMORE • PHOENIX, AZ

For more information, visit [www.myAST.org/meetings/CEOT](http://www.myAST.org/meetings/CEOT)

# Maneuvers

With Valsalva the right ventricle increased in size and the anteroseptum was noted to have suctioned into the inflow cannula triggering ventricular tachycardia.



# Follow-up

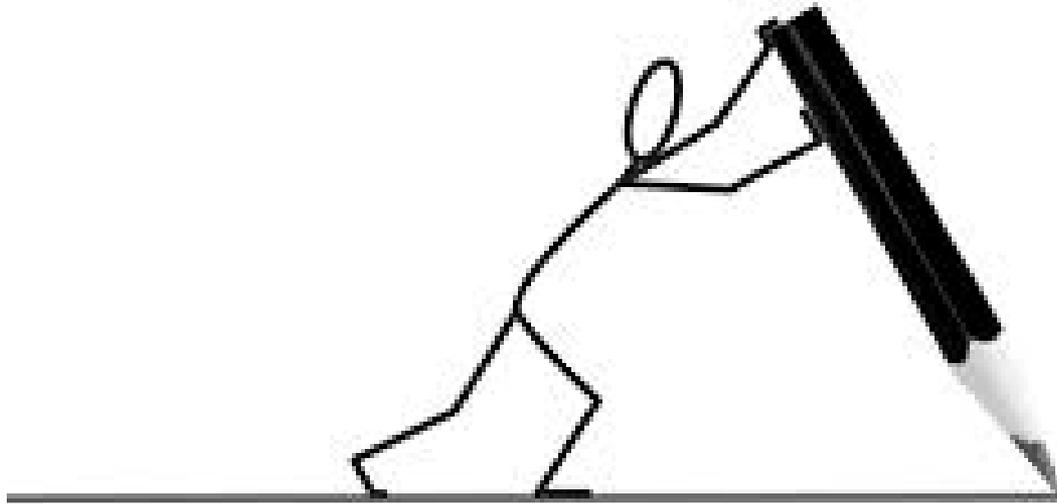
- The LVAD speed was then weaned and at each level the maneuvers were repeated.
- At 9400 RPM, suction events and ventricular tachycardia no longer occurred.
- Over the course of the hospitalization the LDH levels declined and patient was able to transition home without needing an LVAD exchange.
- On follow-up his LDH level had declined to 400 and with no recurrence of ventricular tachycardia on ICD interrogation

# Discussion

- Suction events are largely a clinical diagnosis but can be easily missed because of the transient nature.
- Suction events can often lead to rise in LDH. Before committing patients to thrombolytic therapy or pump exchange, it is imperative to rule out other causes that may result in rise in LDH, as seen in our case.

# Discussion

- Physical examination and provocative maneuvers may still be helpful in troubleshooting LVAD alarms and complications
- Imaging with echocardiography, CT and right heart catheterization are helpful in optimizing and troubleshooting complications
- Role of speed optimization to improve patient hemodynamics/symptoms vs. creating potential complications



**AST** | AMERICAN SOCIETY OF  
TRANSPLANTATION



CUTTING EDGE of **TRANSPLANTATION**

## **TRANSPLANT SUMMIT 2018**

*Breaking Through Regulatory Barriers  
to Unleash Transplant Innovation*

**FEBRUARY 8-10, 2018 • ARIZONA BILTMORE • PHOENIX, AZ**

**For more information, visit [www.myAST.org/meetings/CEOT](http://www.myAST.org/meetings/CEOT)**