

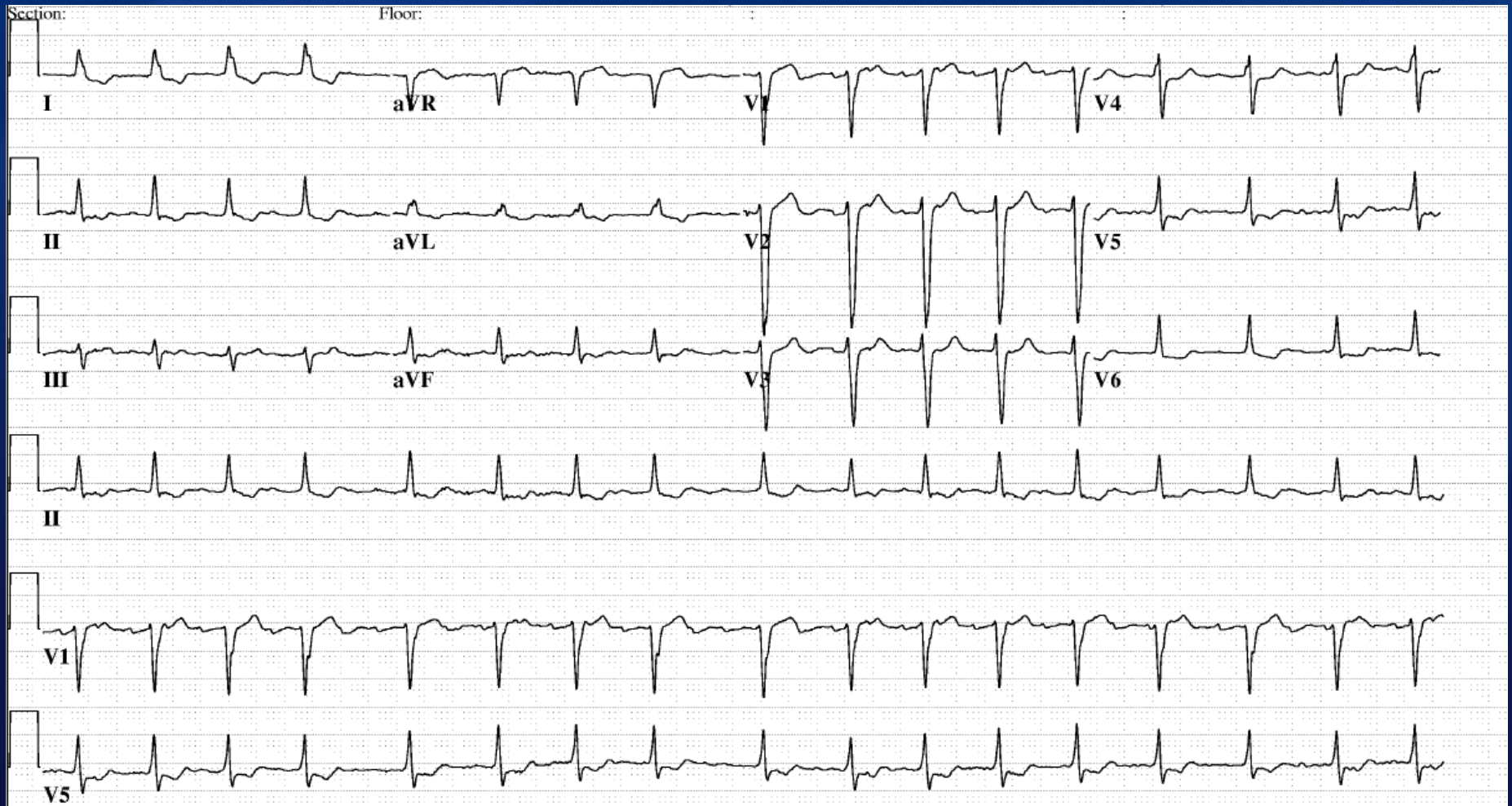


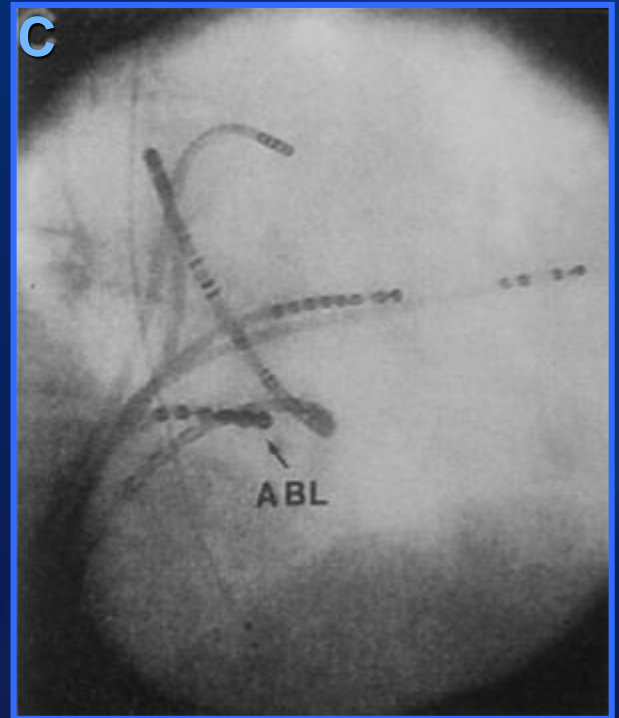
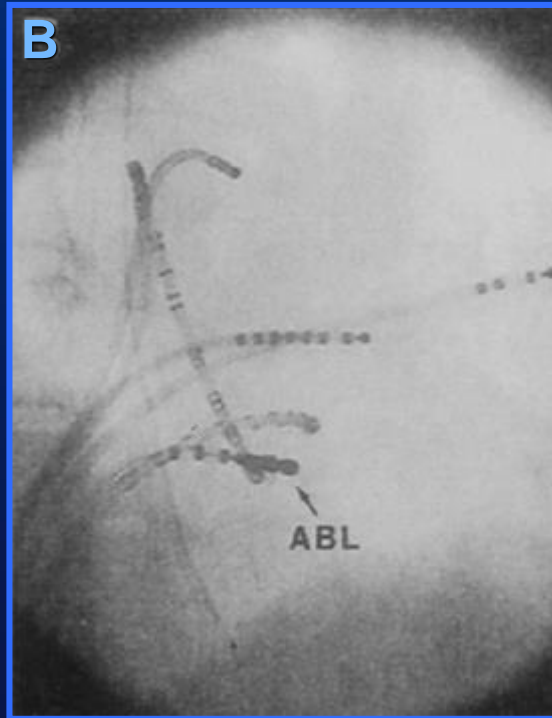
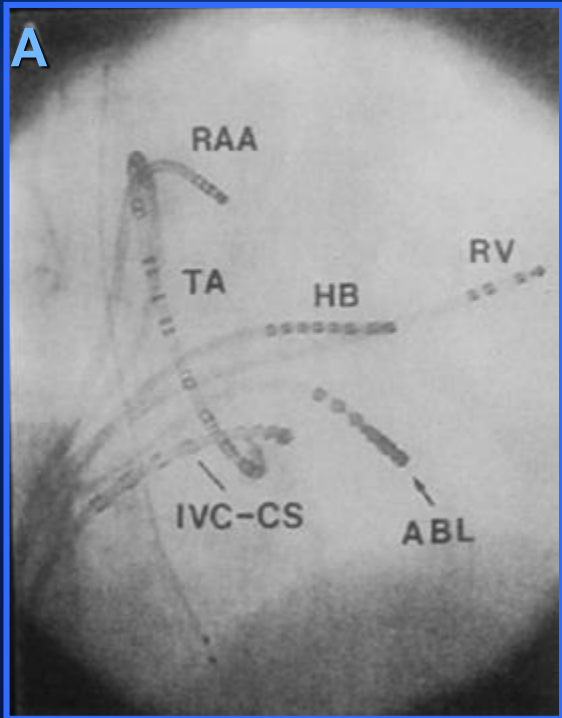
# LA Anatomy: What Should We Know

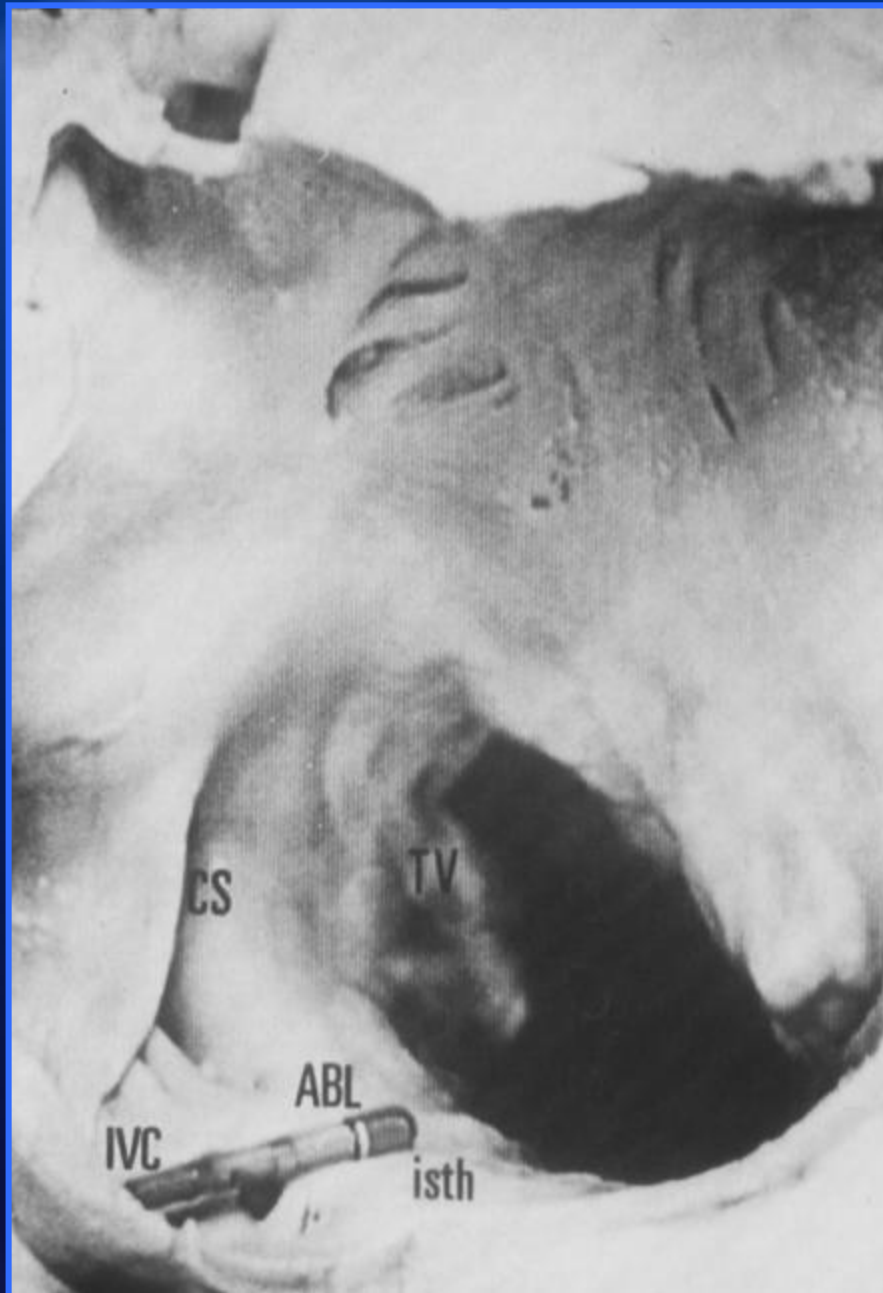


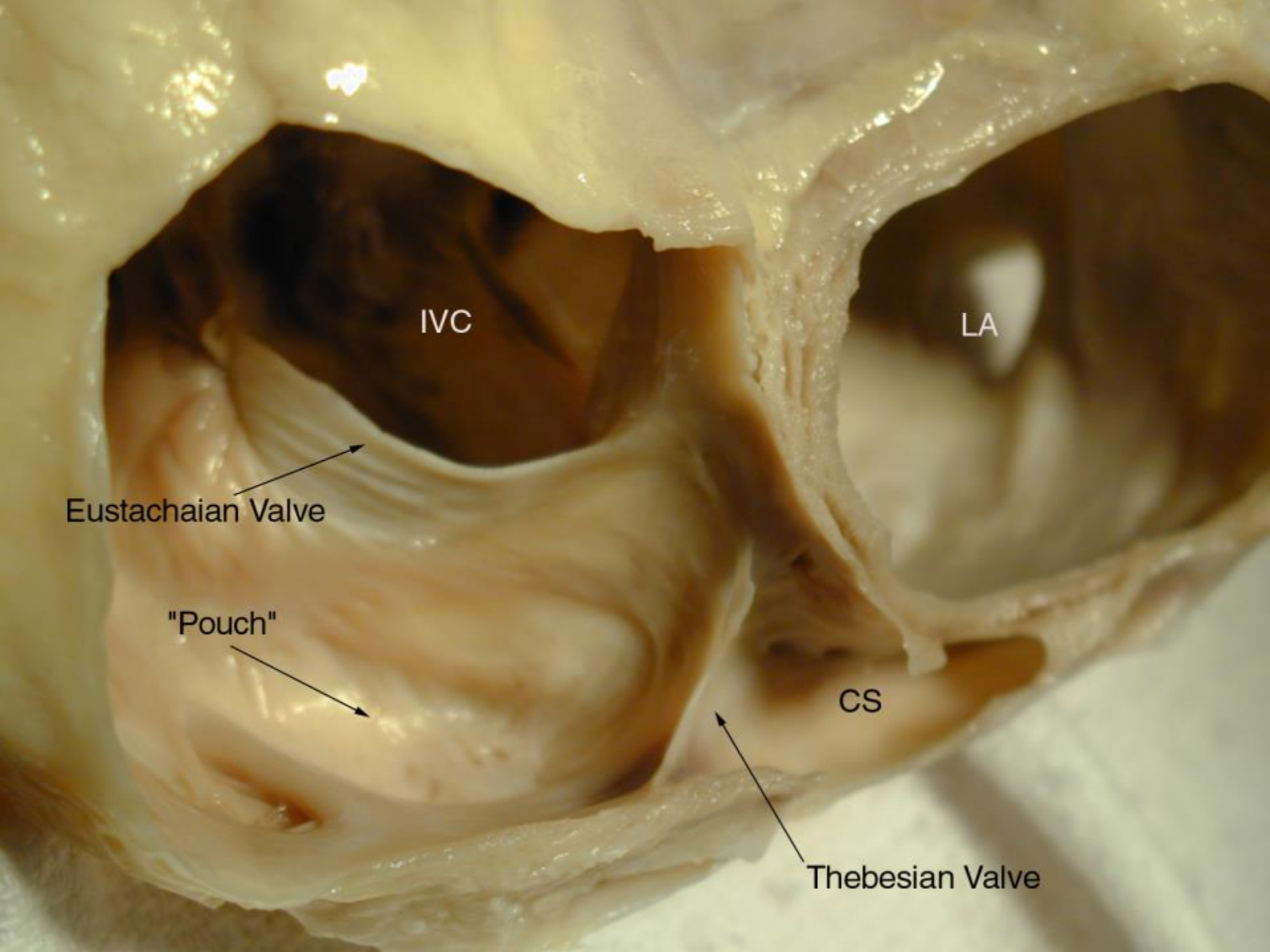
Samuel J. Asirvatham, M.D.  
Mayo Clinic – Rochester  
AF, VT, VF Summit – Chicago, Illinois  
Saturday, December 7, 2019: 7:55 to 8:20 a.m.

# Atrial Flutter









IVC

LA

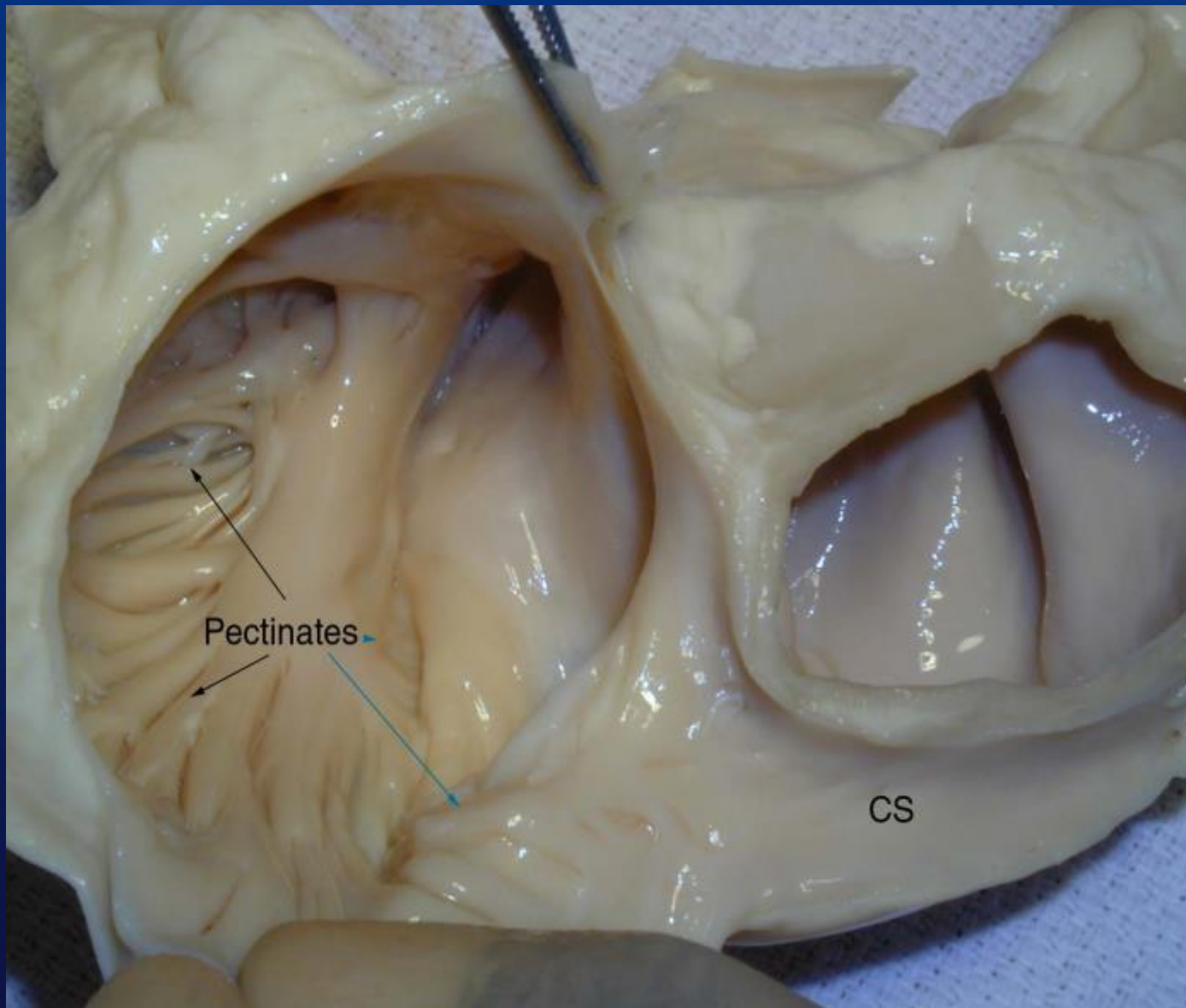
Eustachian Valve

"Pouch"

CS

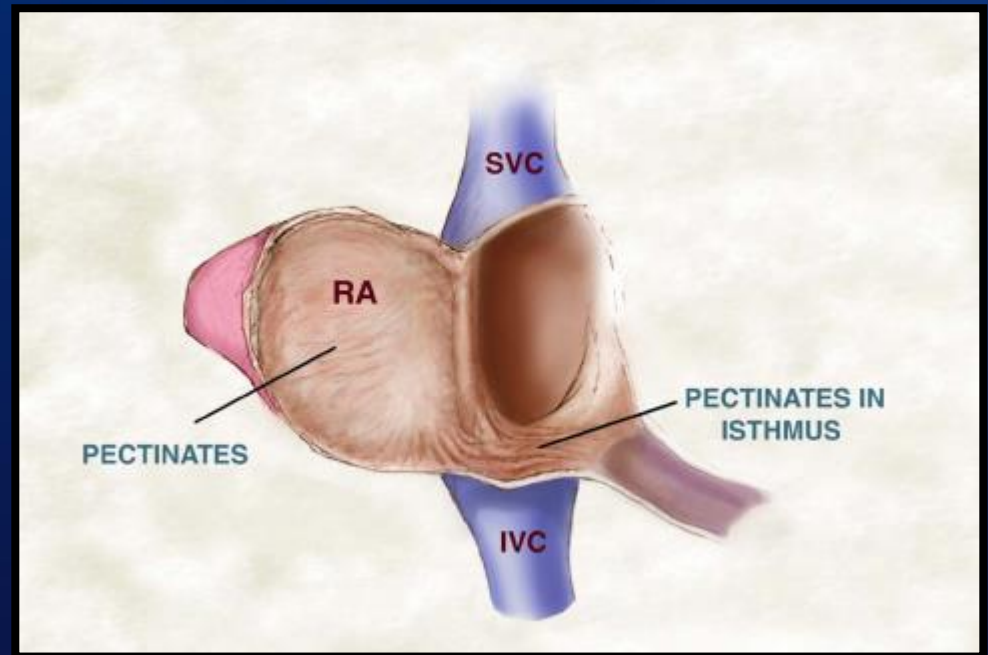
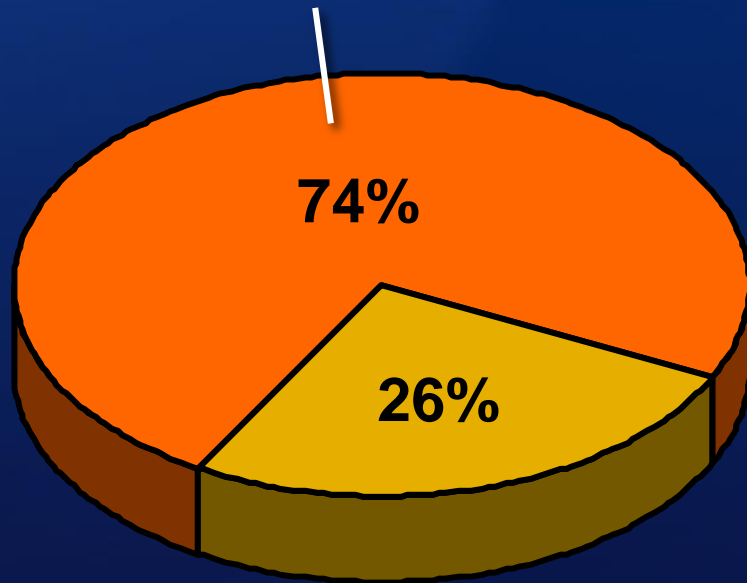
Thebesian Valve

# Pectinates encroach Isthmus

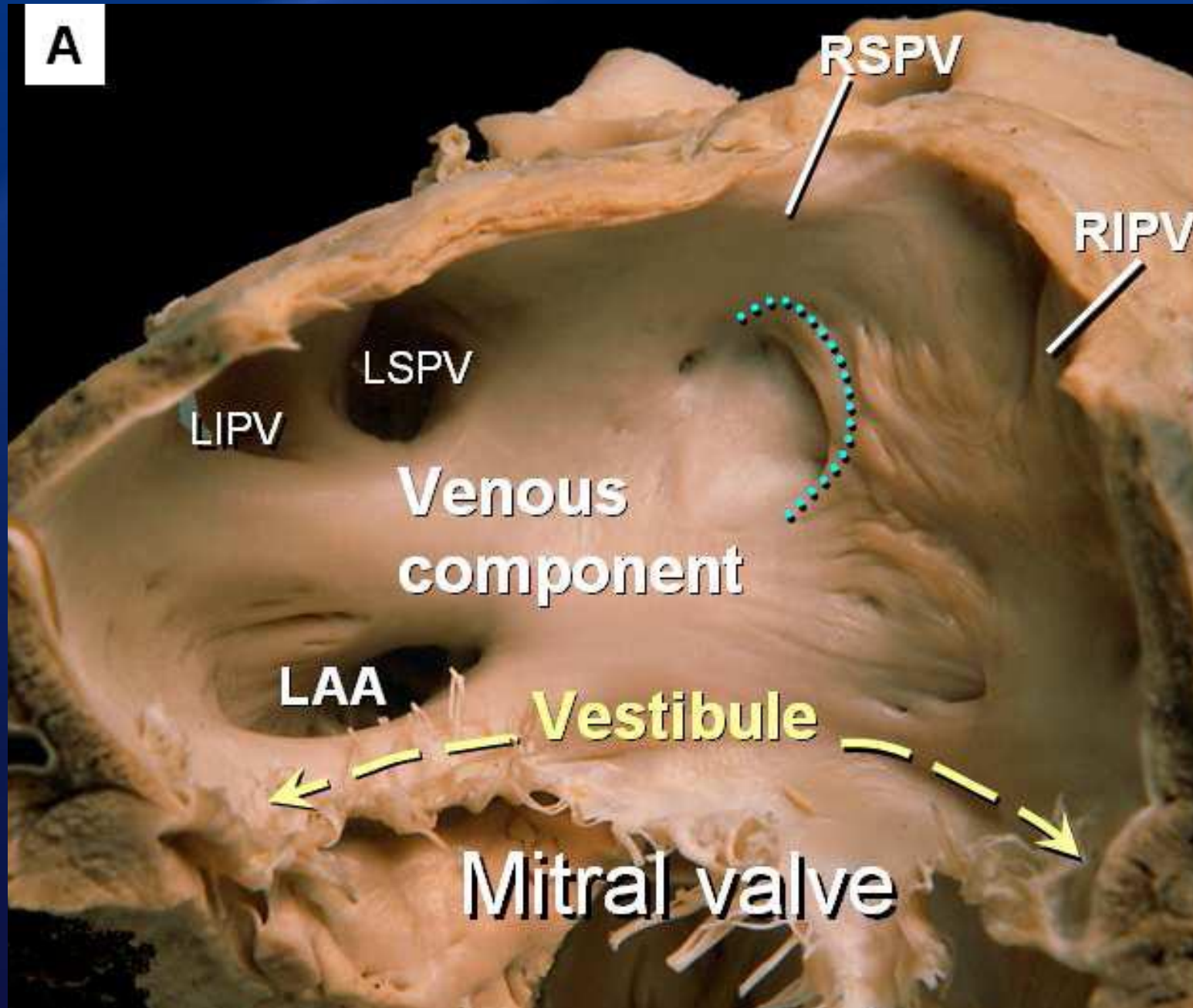


# Extension of Pectinate Muscles Across Tricuspid Valve-Inferior Vena Cava Isthmus

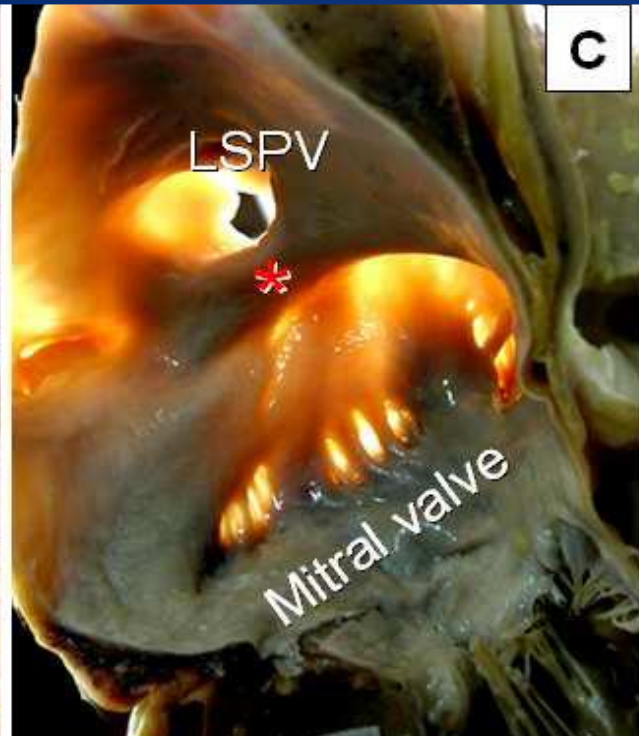
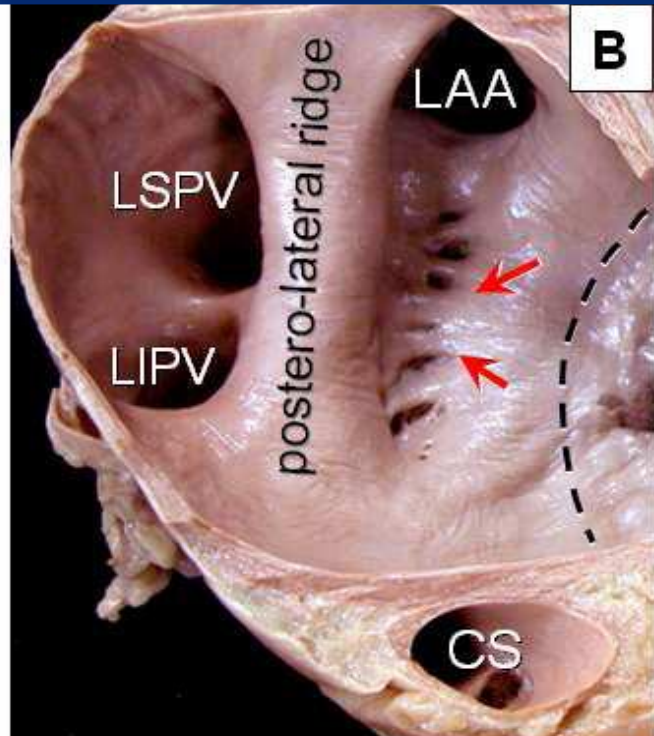
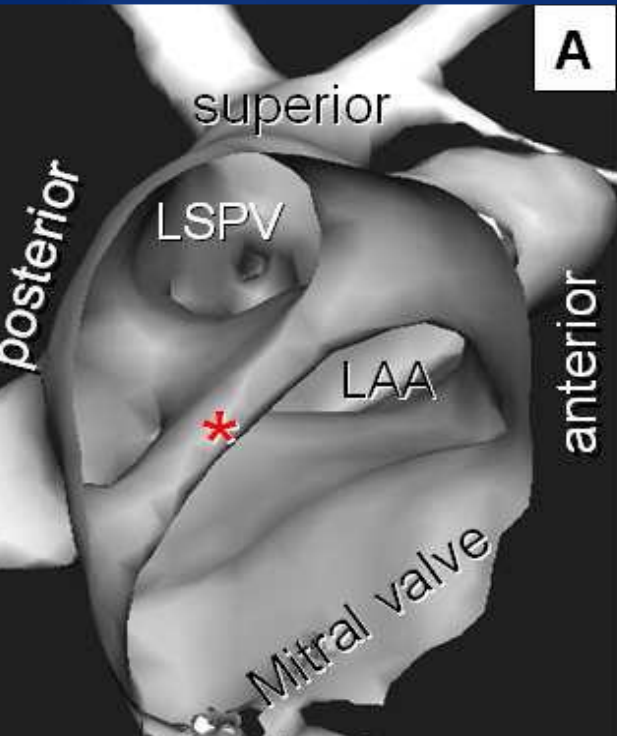
**Pectinates  
cross isthmus**



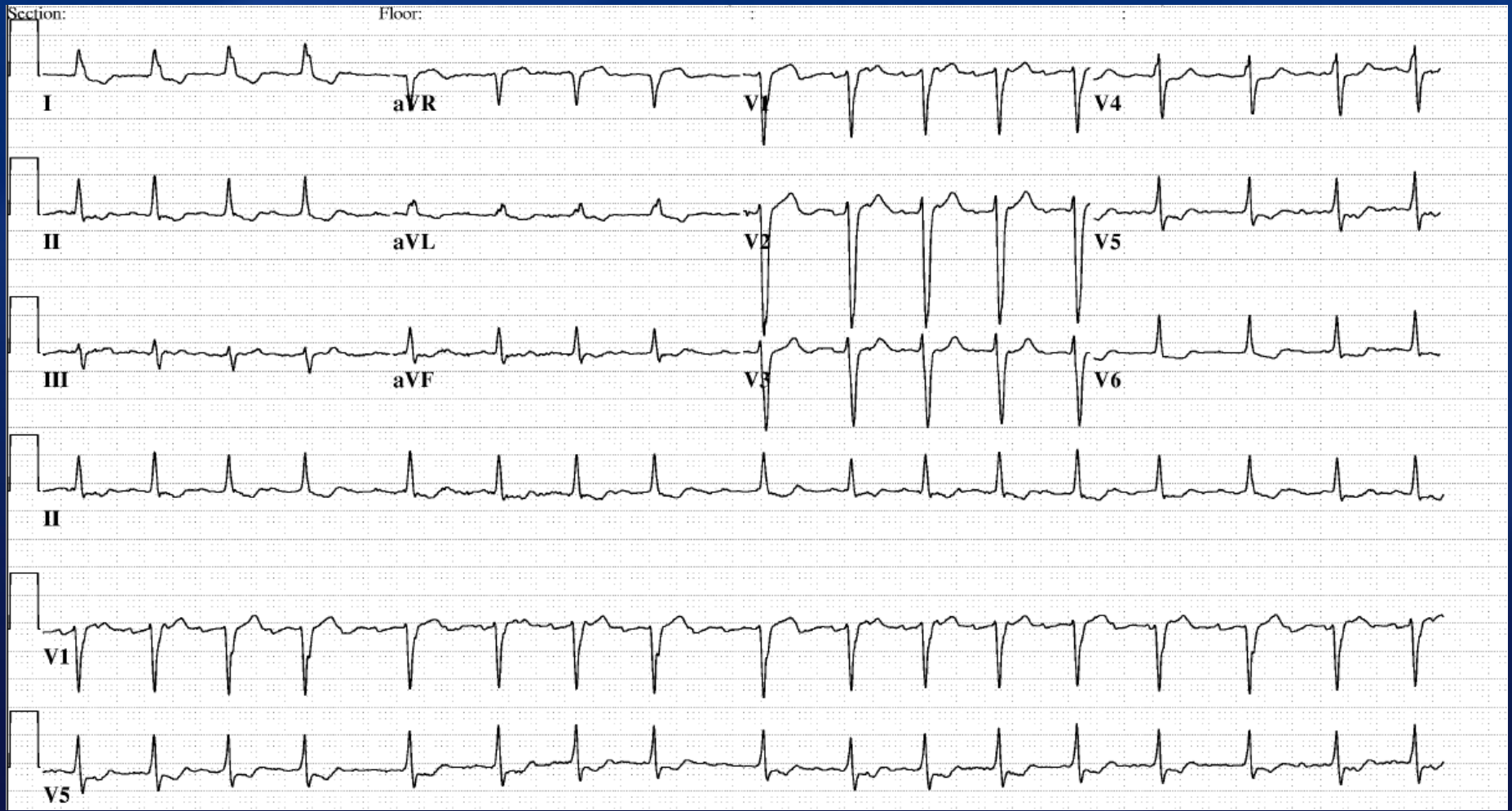
**A**



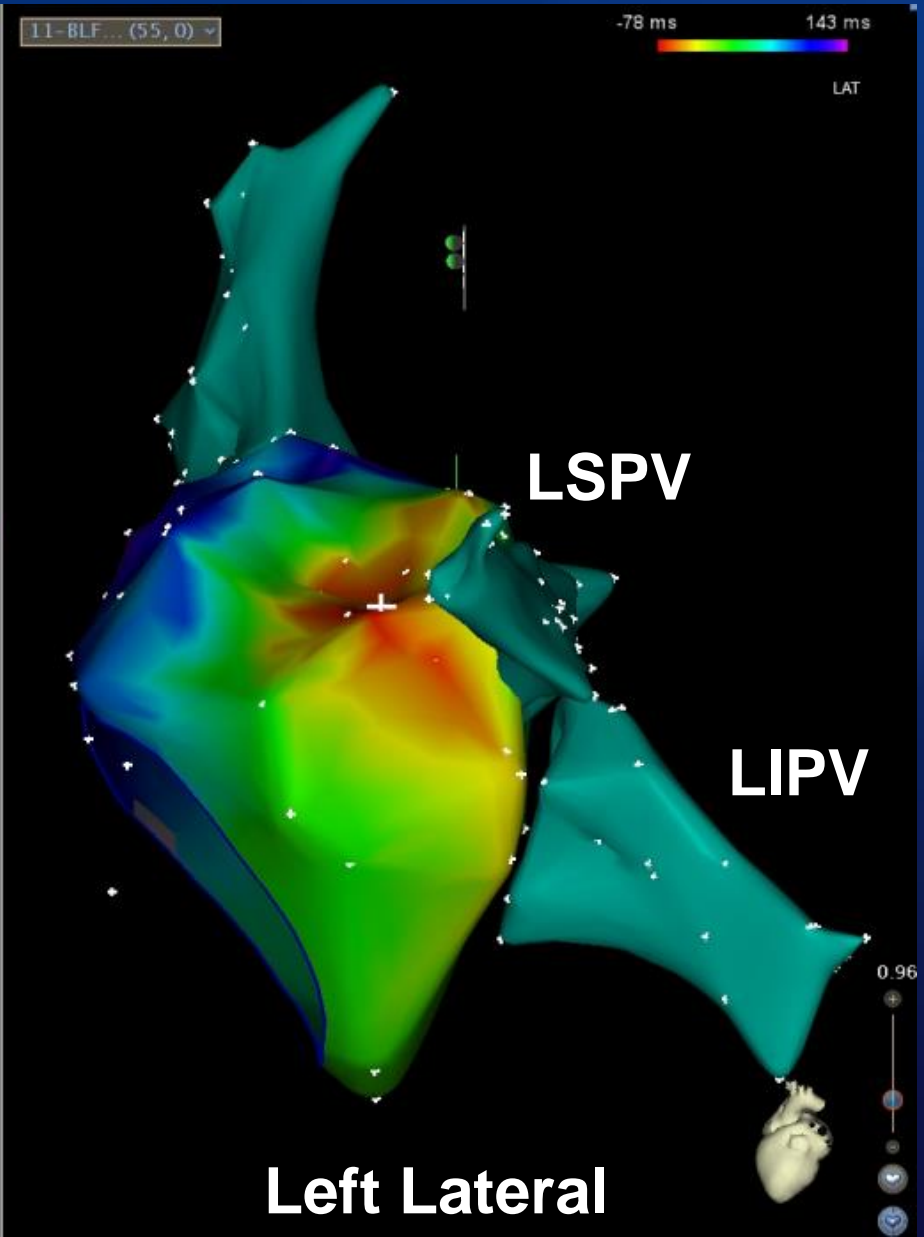
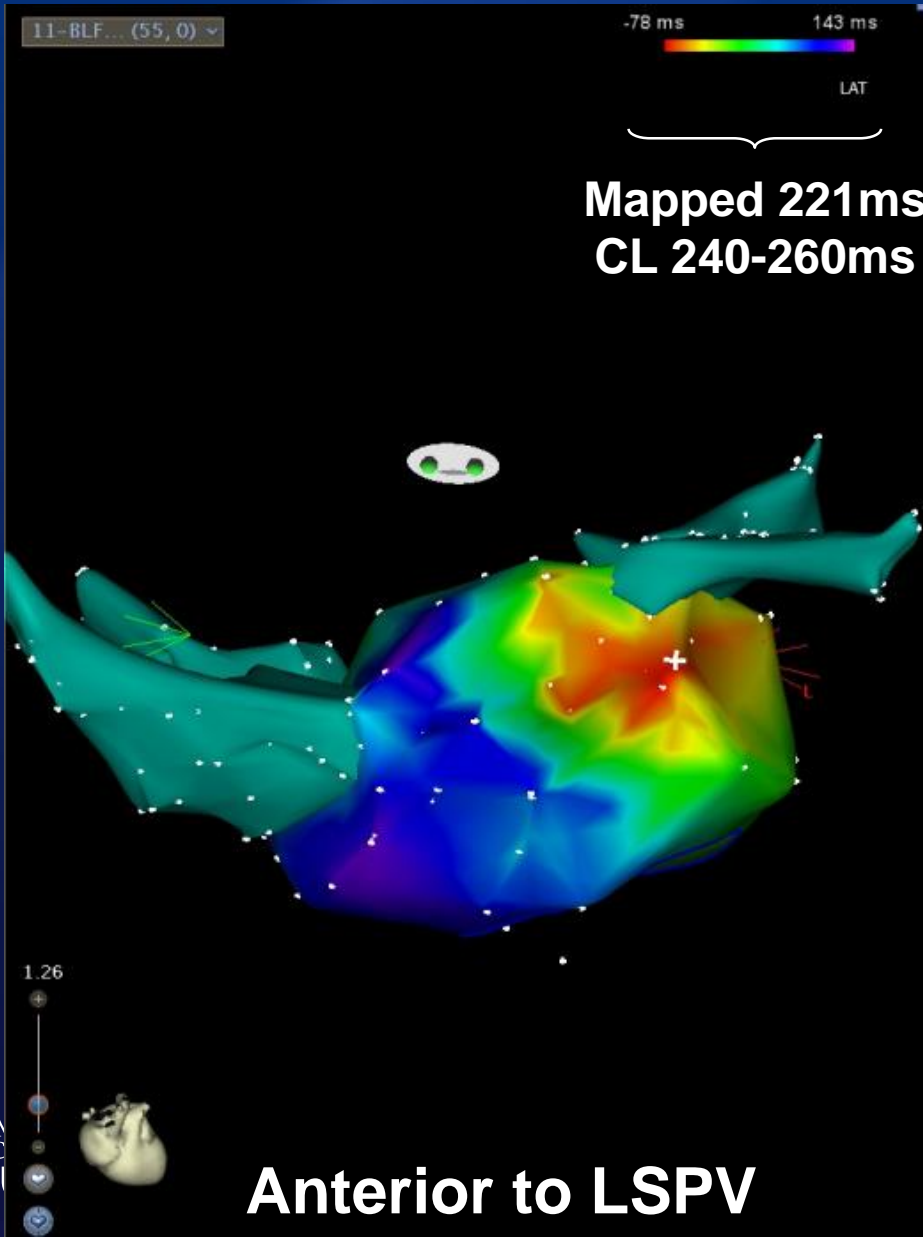




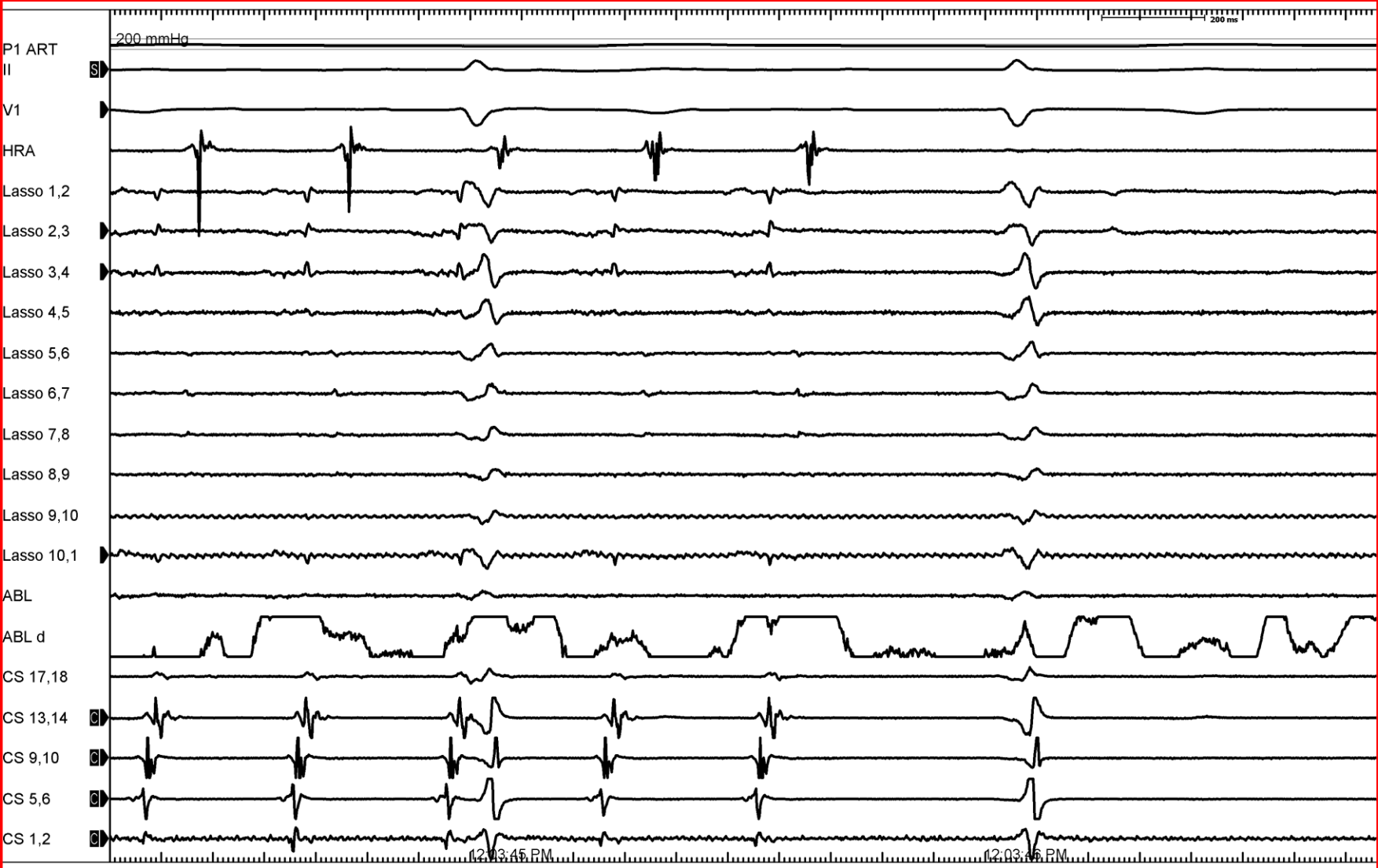
# Atrial Flutter 1/2011

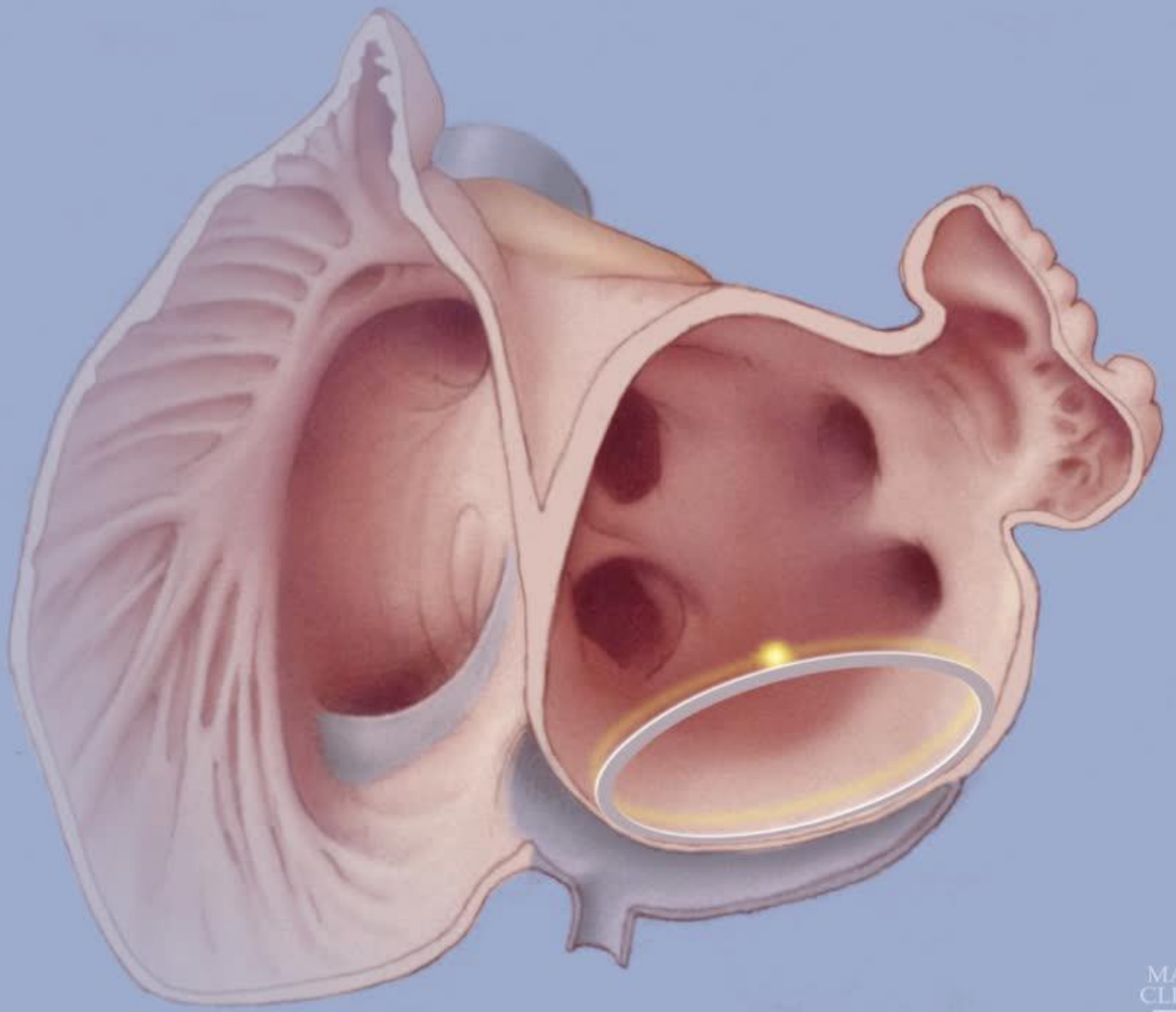


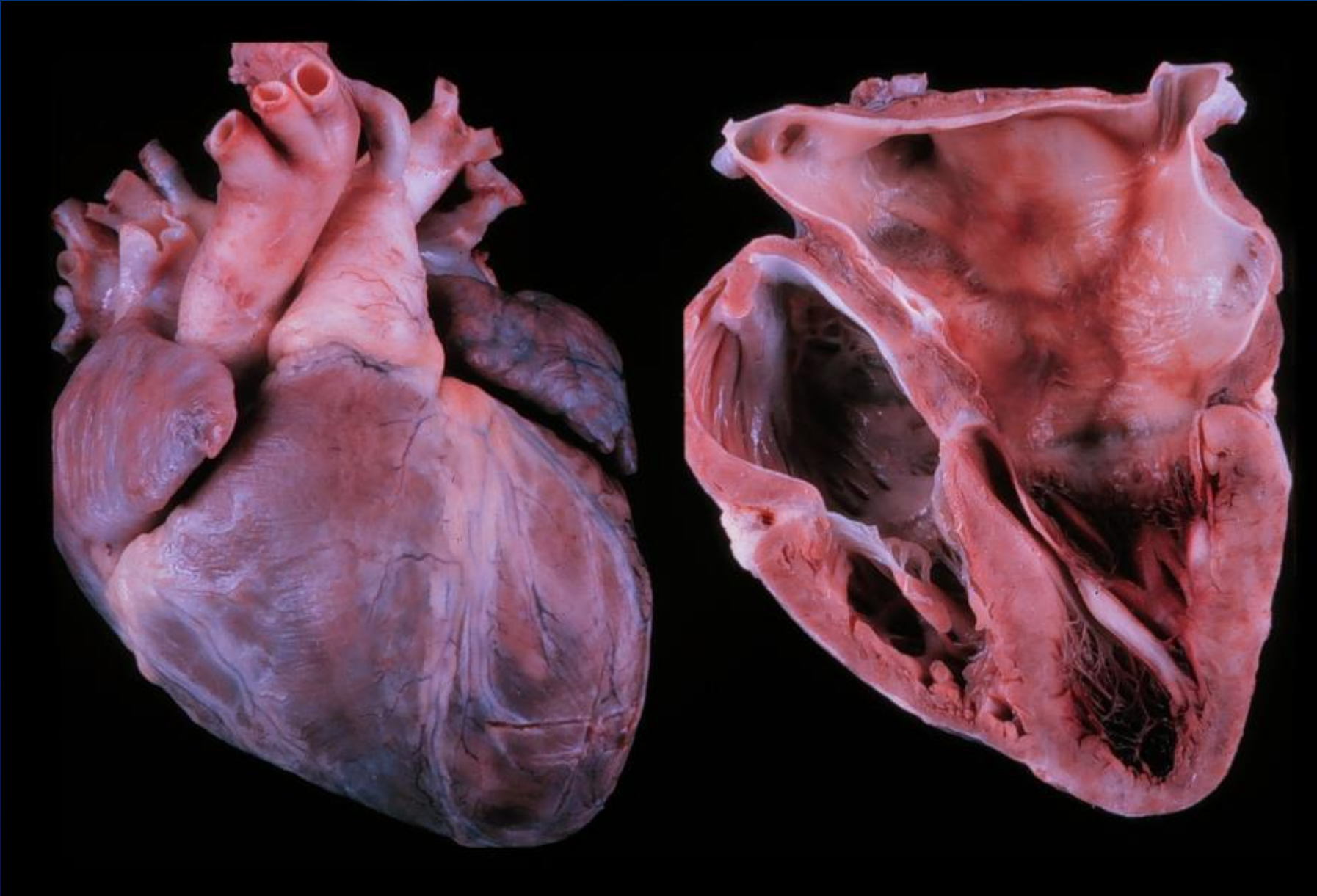
# Activation Mapping in Flutter



# Flutter Termination with Point Ablation







# Overview

## Cardiac Anatomy for Electrophysiology

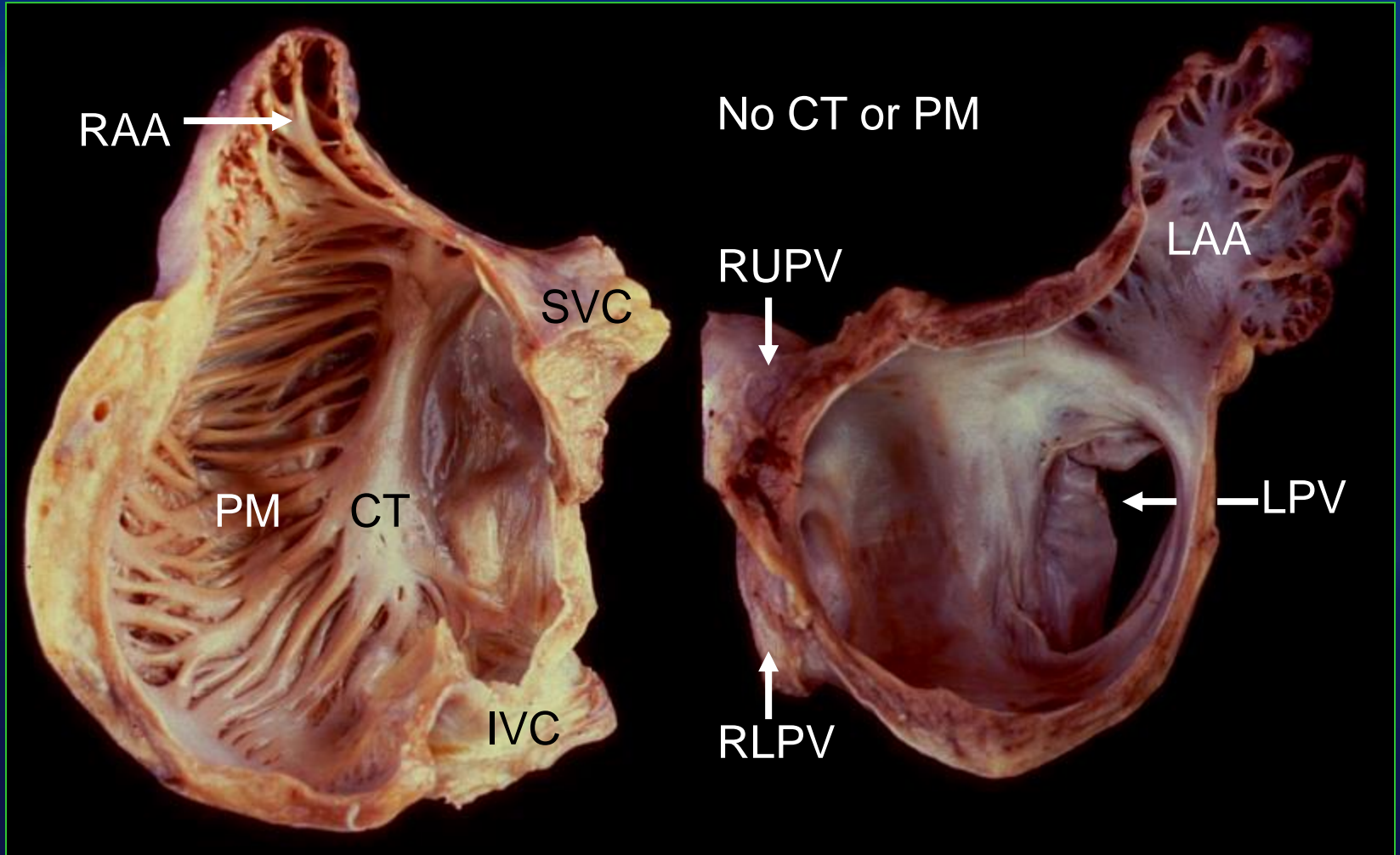
- Typical atrial flutter
  - Anatomy of the cavotricuspid isthmus
  - Sub-Eustachian pouches
  - Pectinates
- Atrial fibrillation
  - Pulmonary vein
  - Extra pulmonary vein triggers
  - Preventing collateral damage





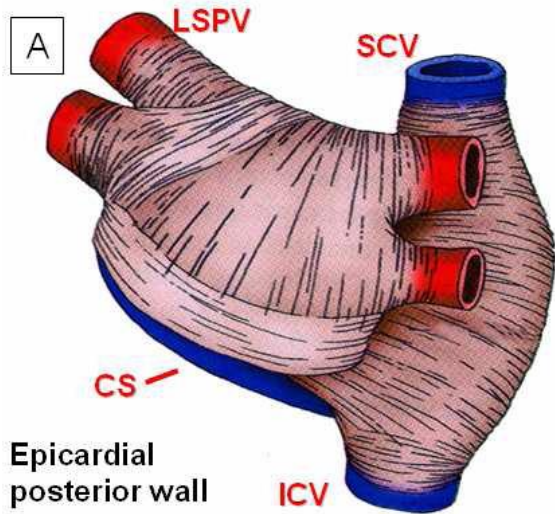
# Internal Cardiac Anatomy

## Atria

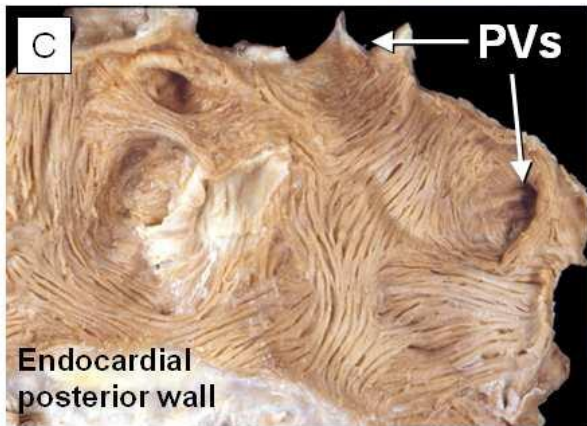
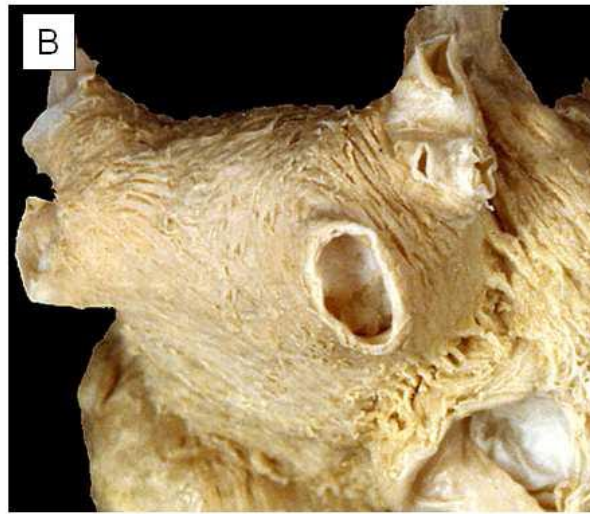


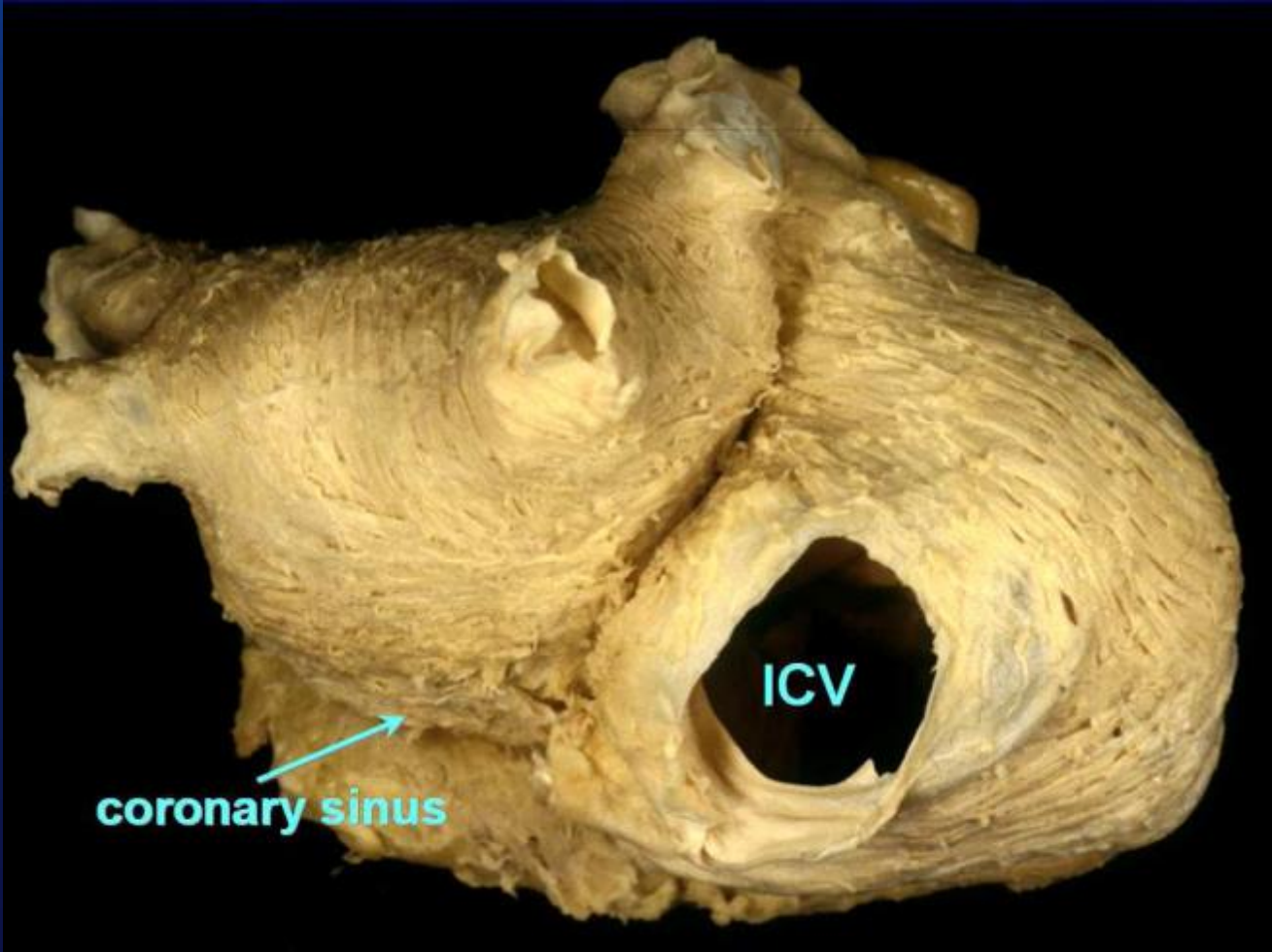
Right Atrium

Left Atrium

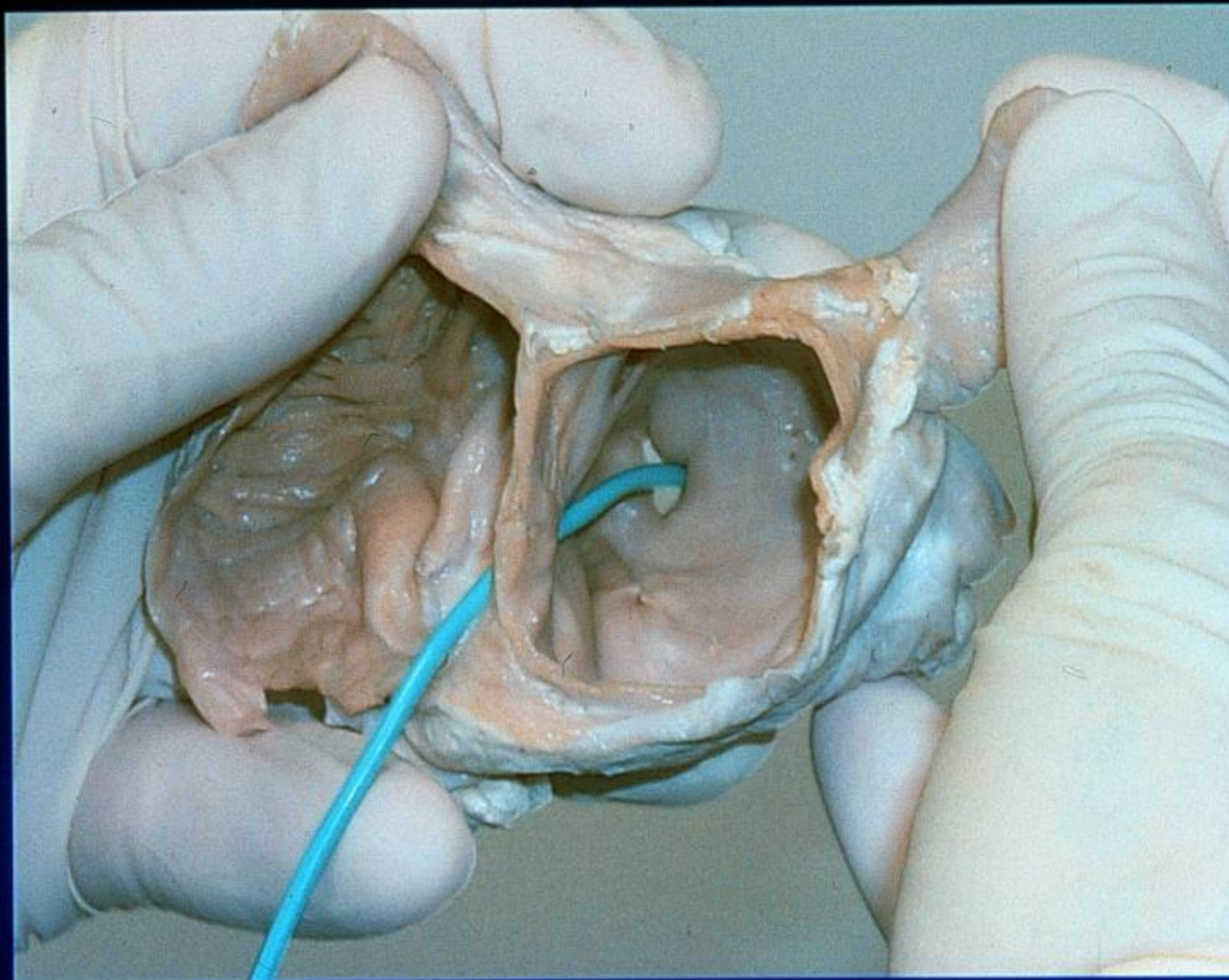


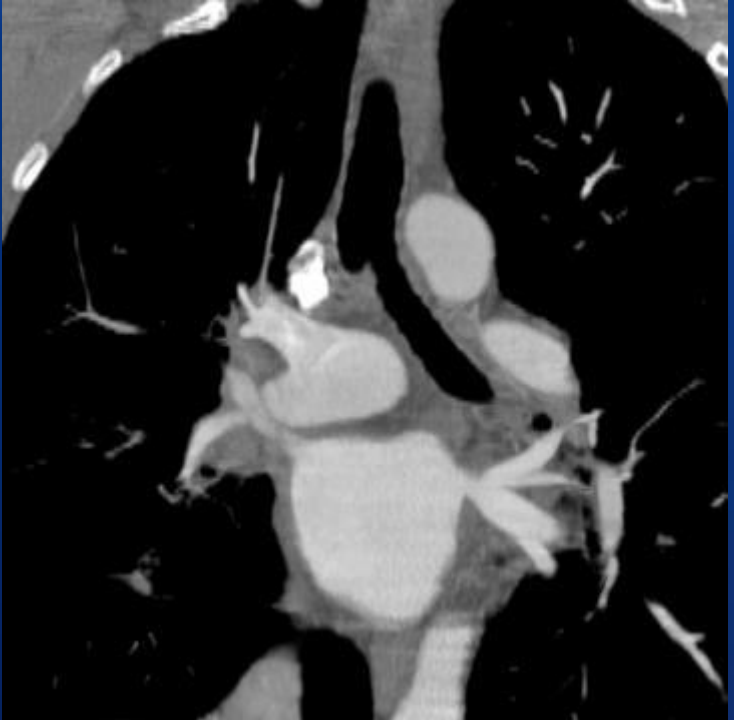
Epicardial  
posterior wall

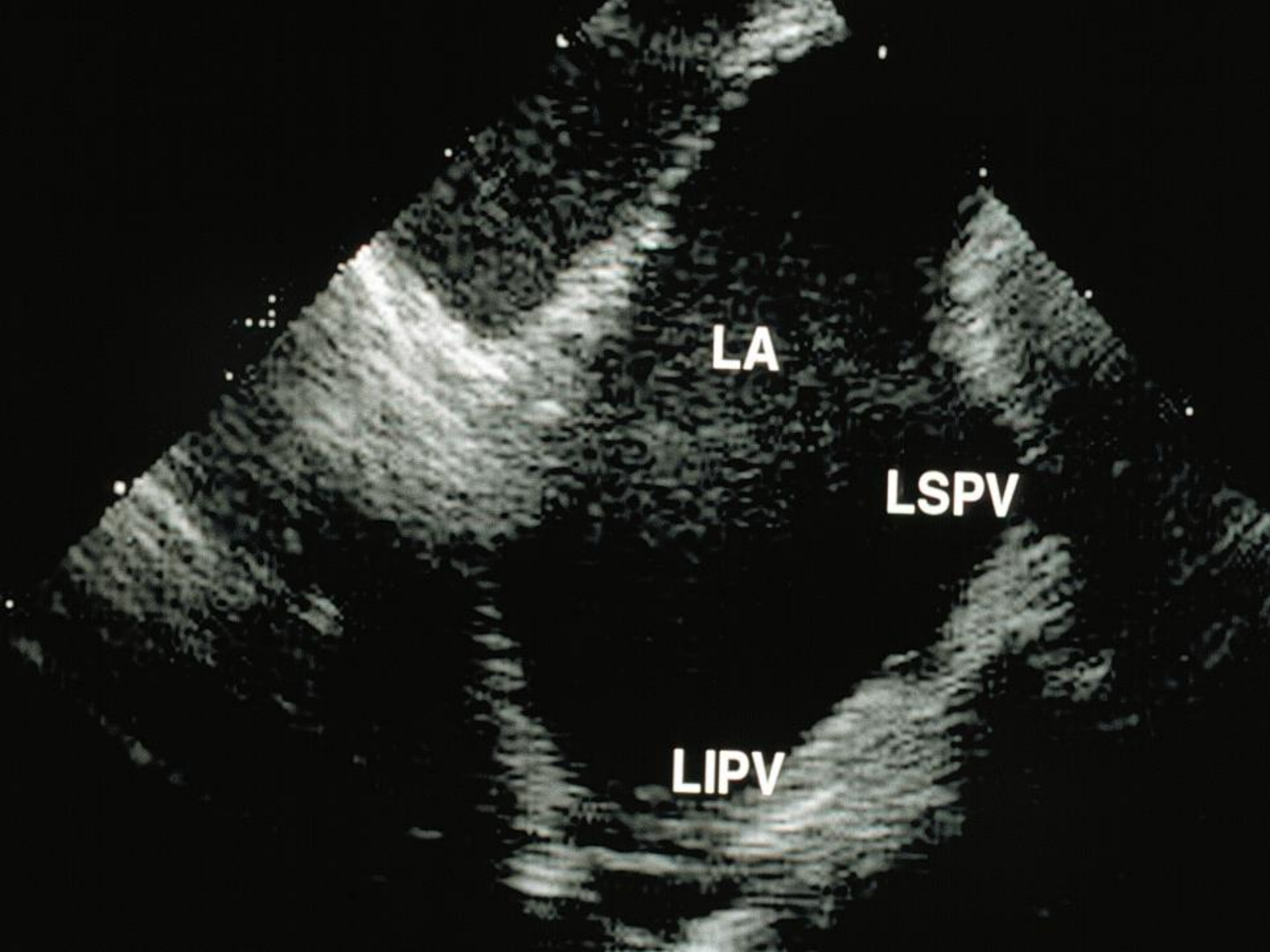




## Focal Atrial Fibrillation Ablation





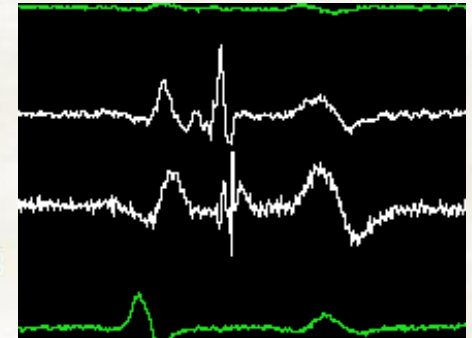
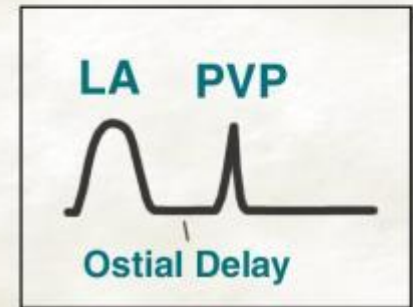
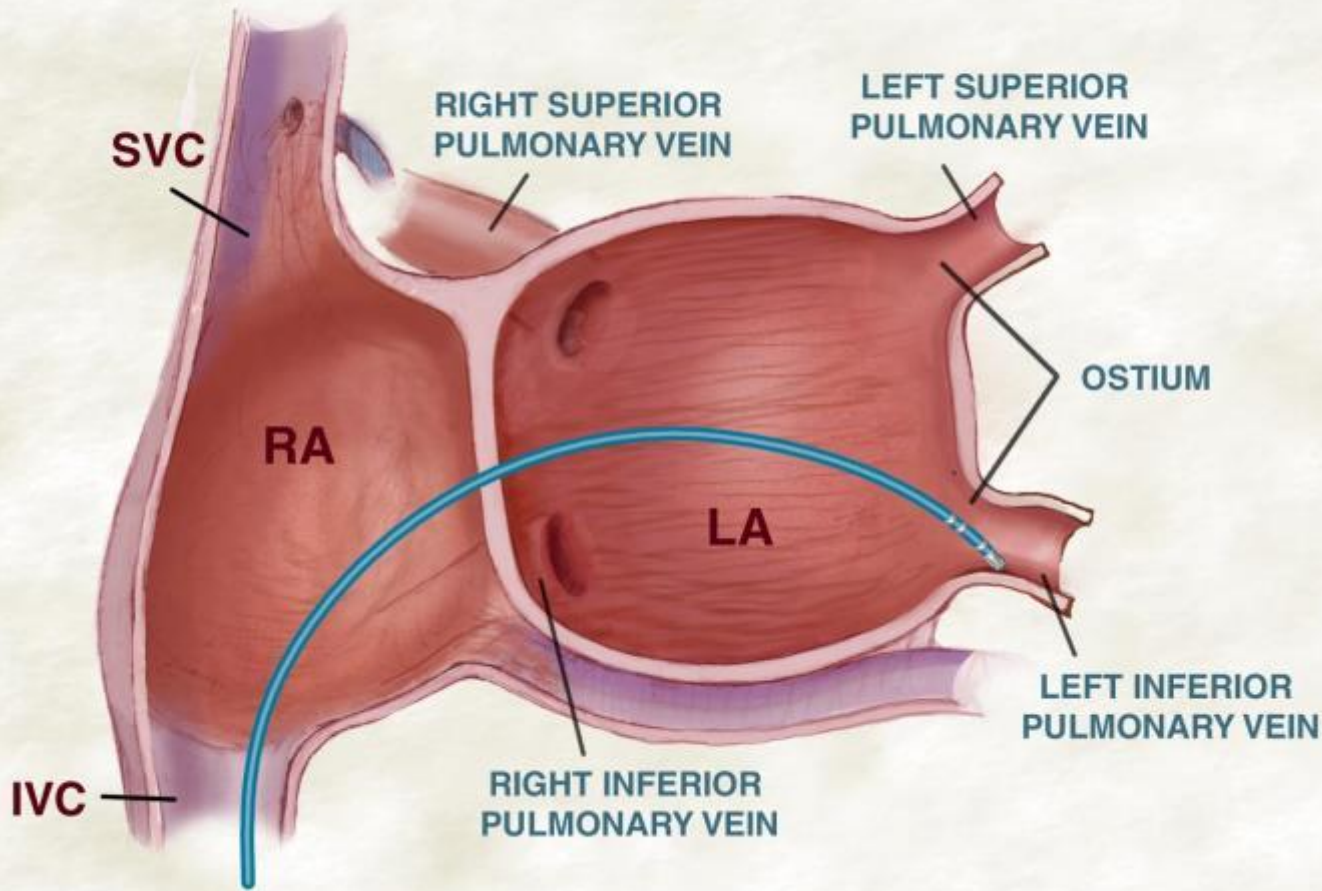


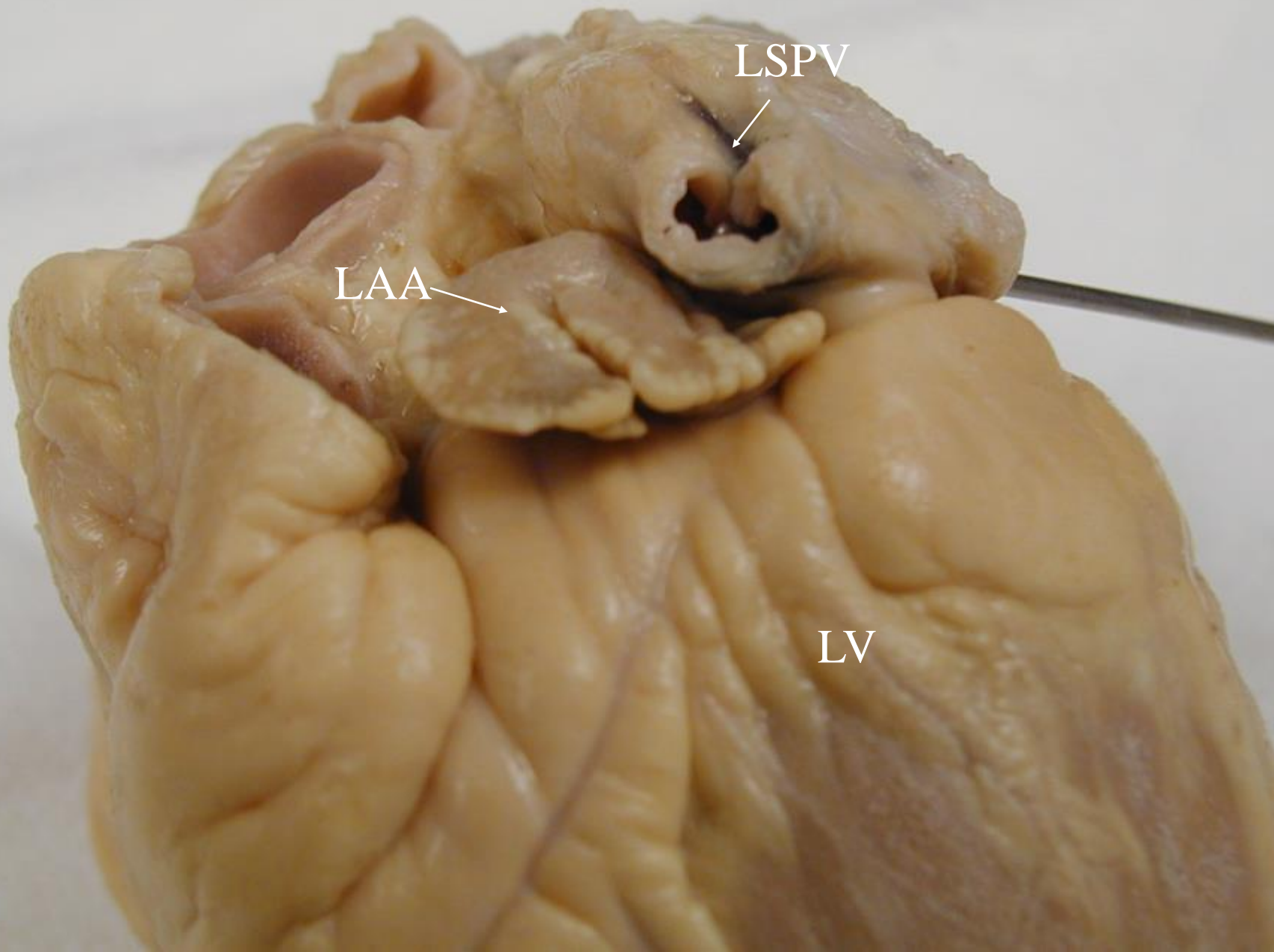
LA

LSPV

LIPV

# THE PULMONARY VEIN POTENTIAL





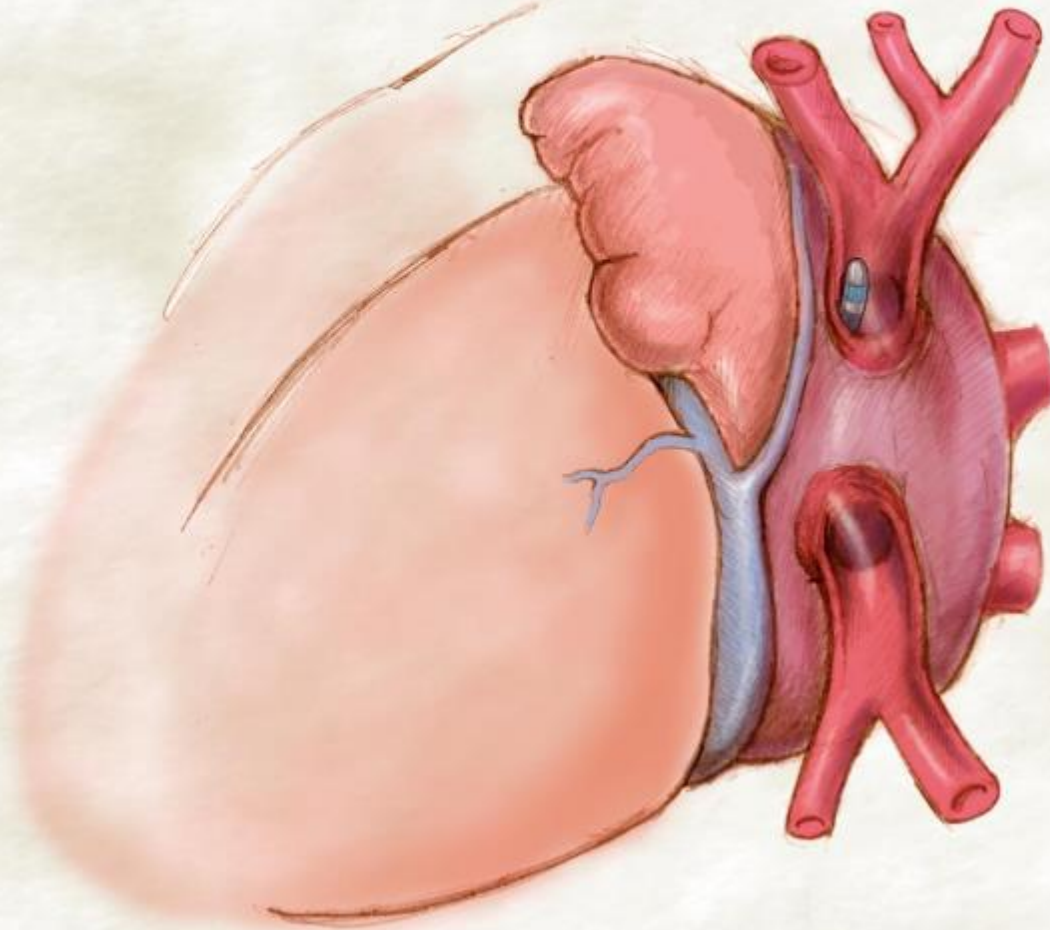
LSPV

LAA

LV



# GENERATION OF COMPLEX POTENTIALS

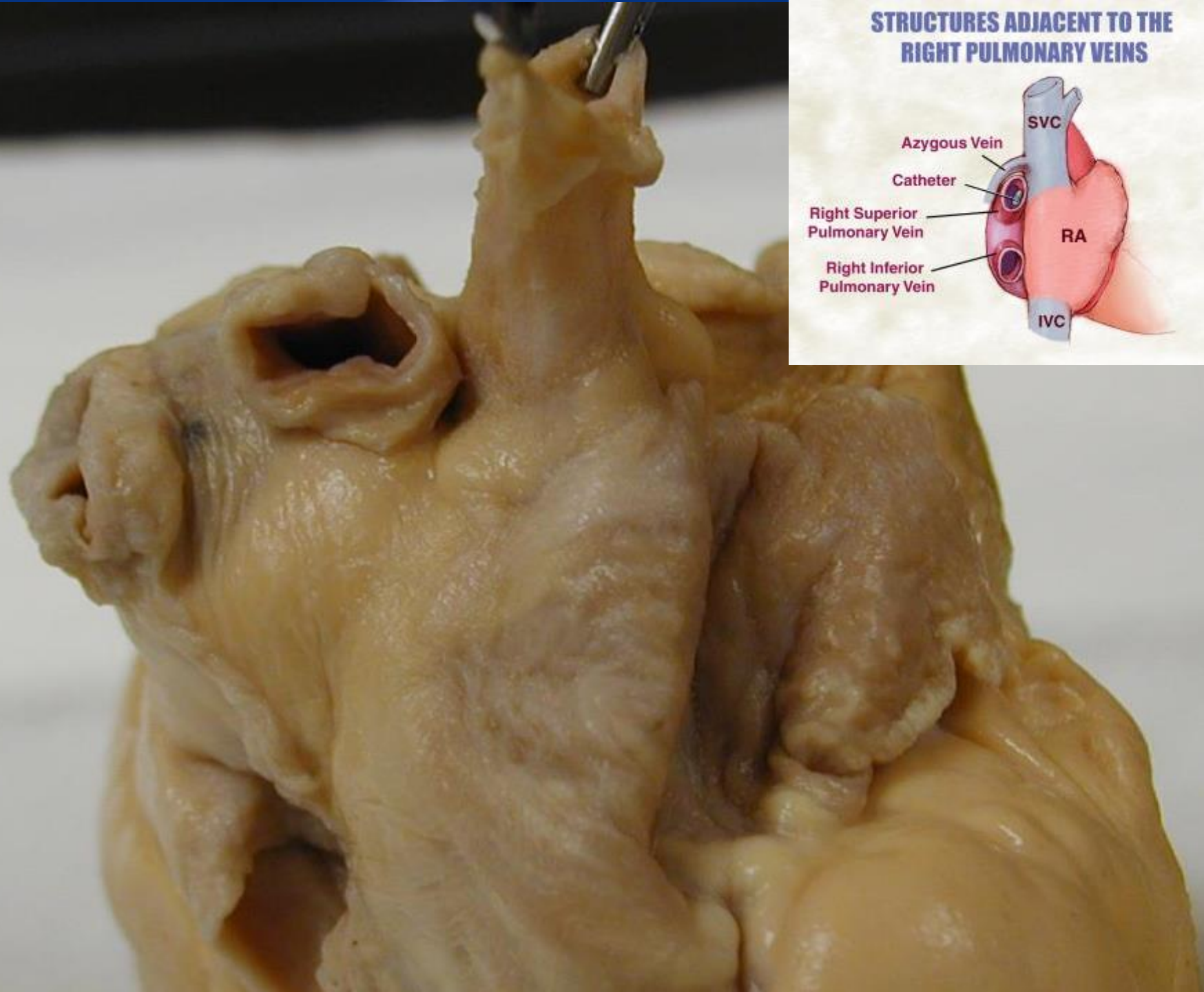


## COMPLEX POTENTIALS

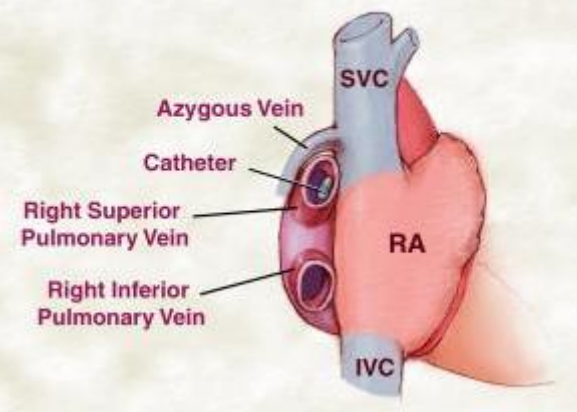


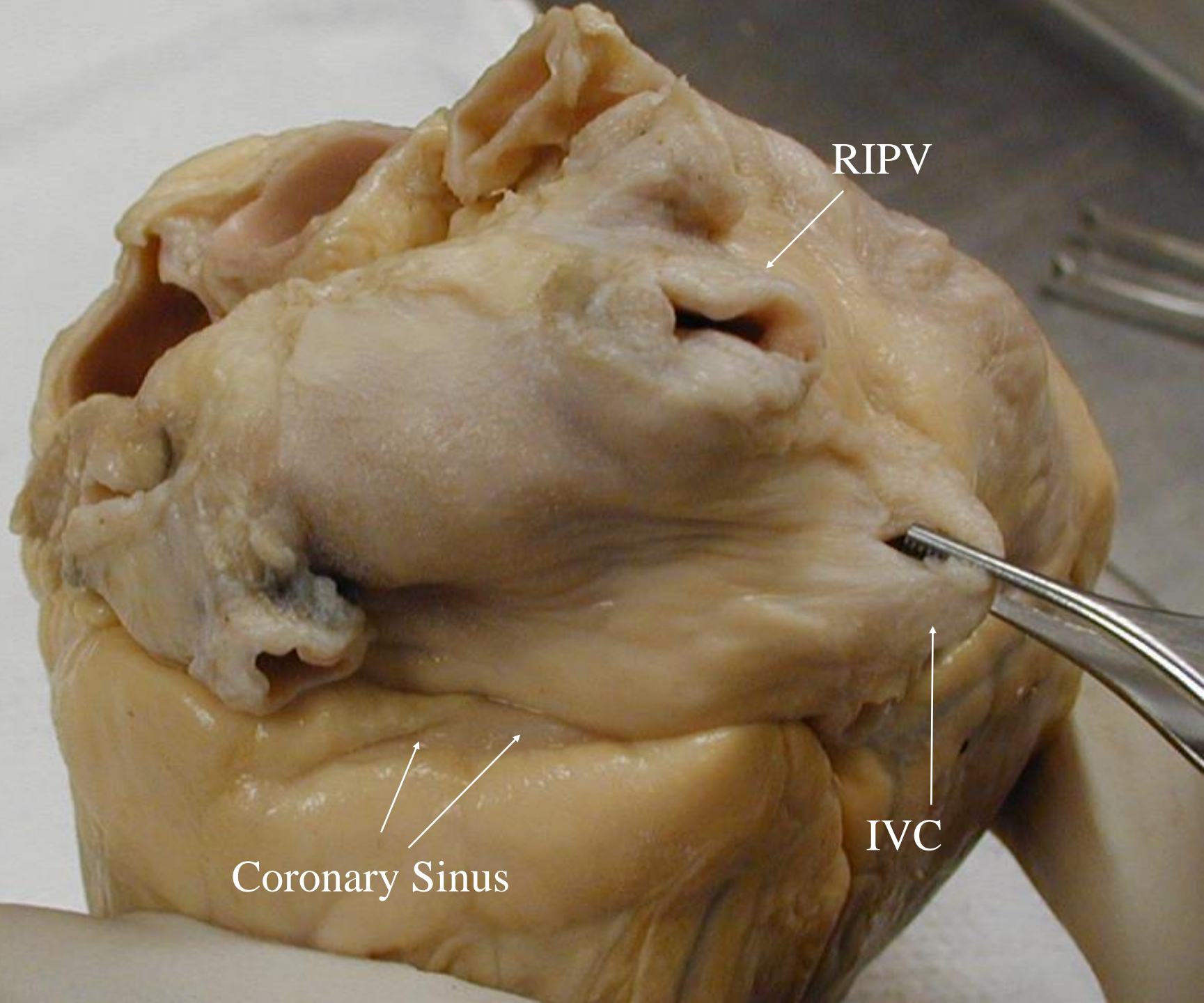
## Potential Causes

- LA
- PV Potential
- LA appendage
- Vein of Marshall
- adjacent Pul vein
- Combination



### STRUCTURES ADJACENT TO THE RIGHT PULMONARY VEINS



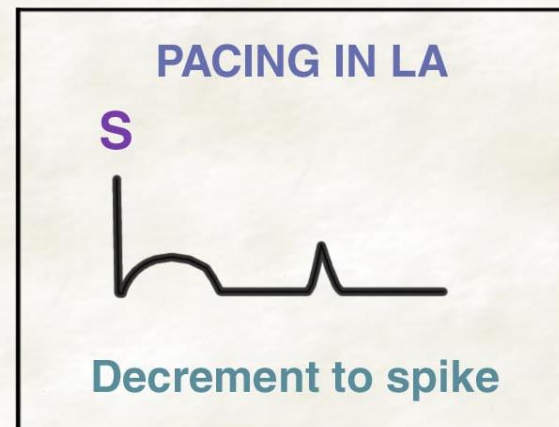
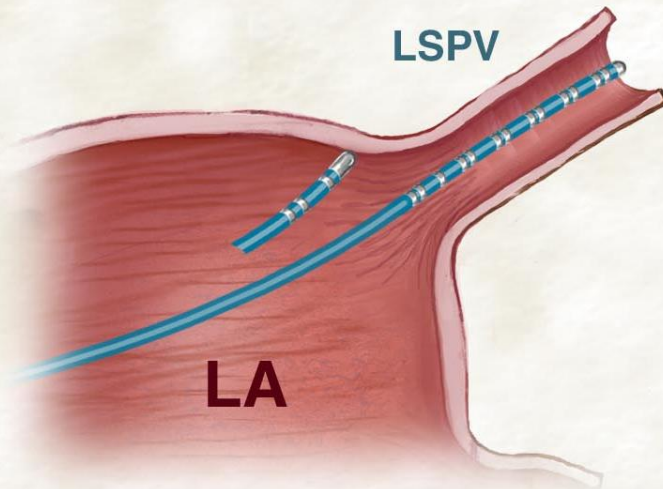
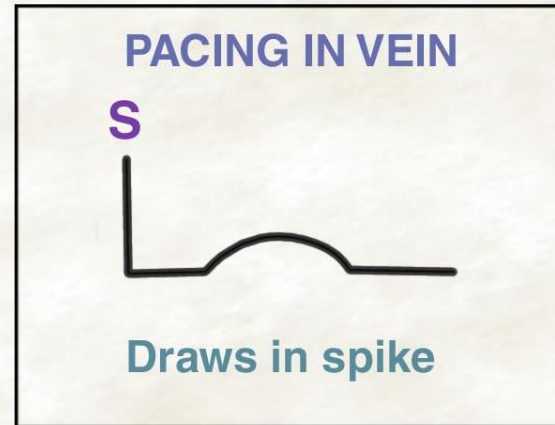
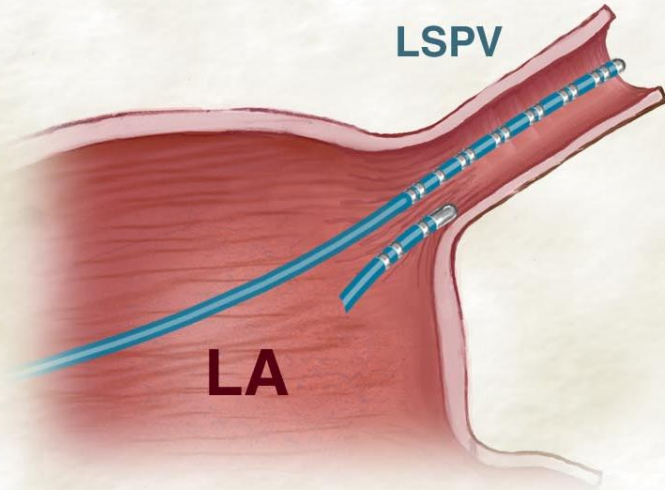


RIPV

Coronary Sinus

IVC

# THE ELECTRICAL OSTIUM

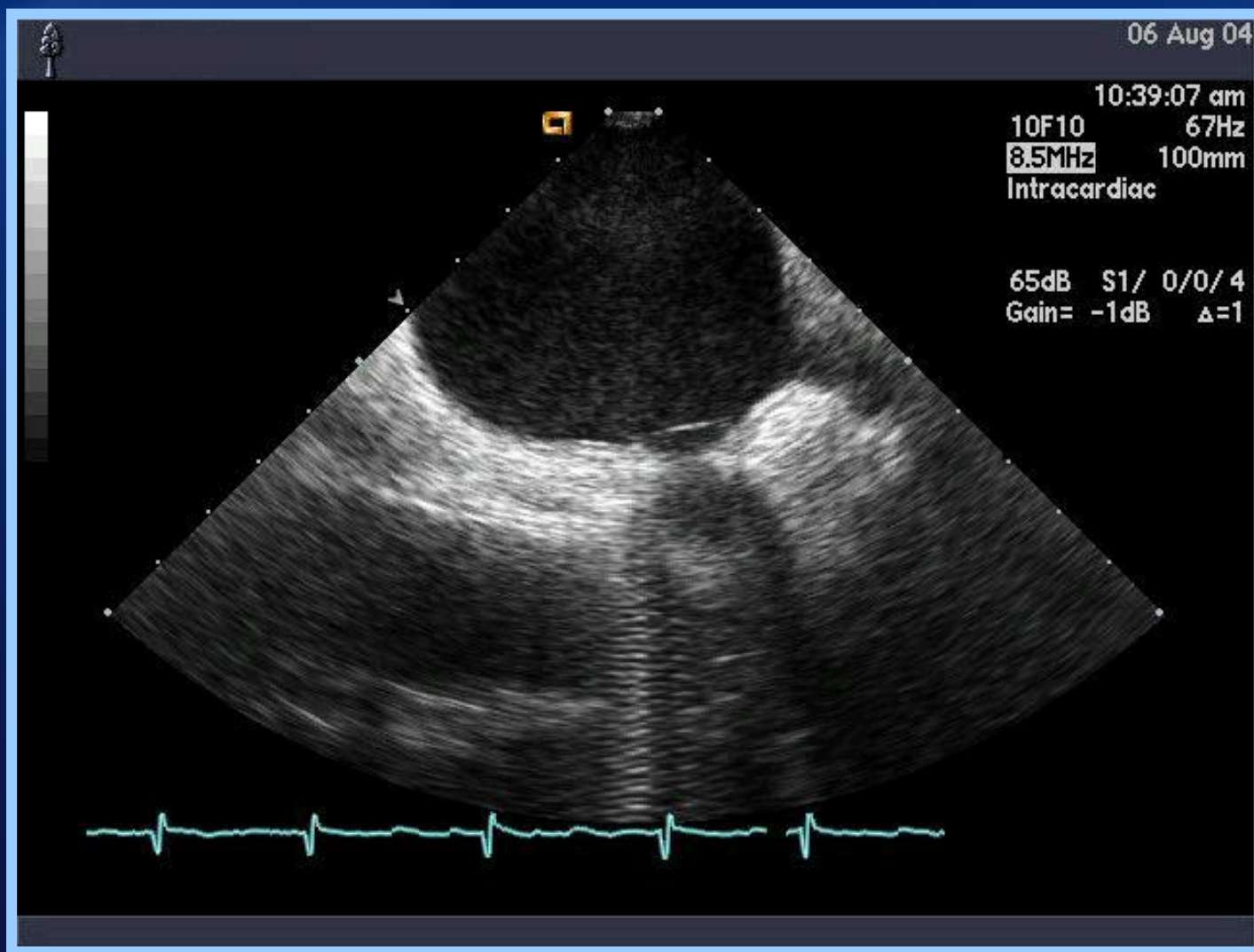


Point of transition = Electrical Ostium



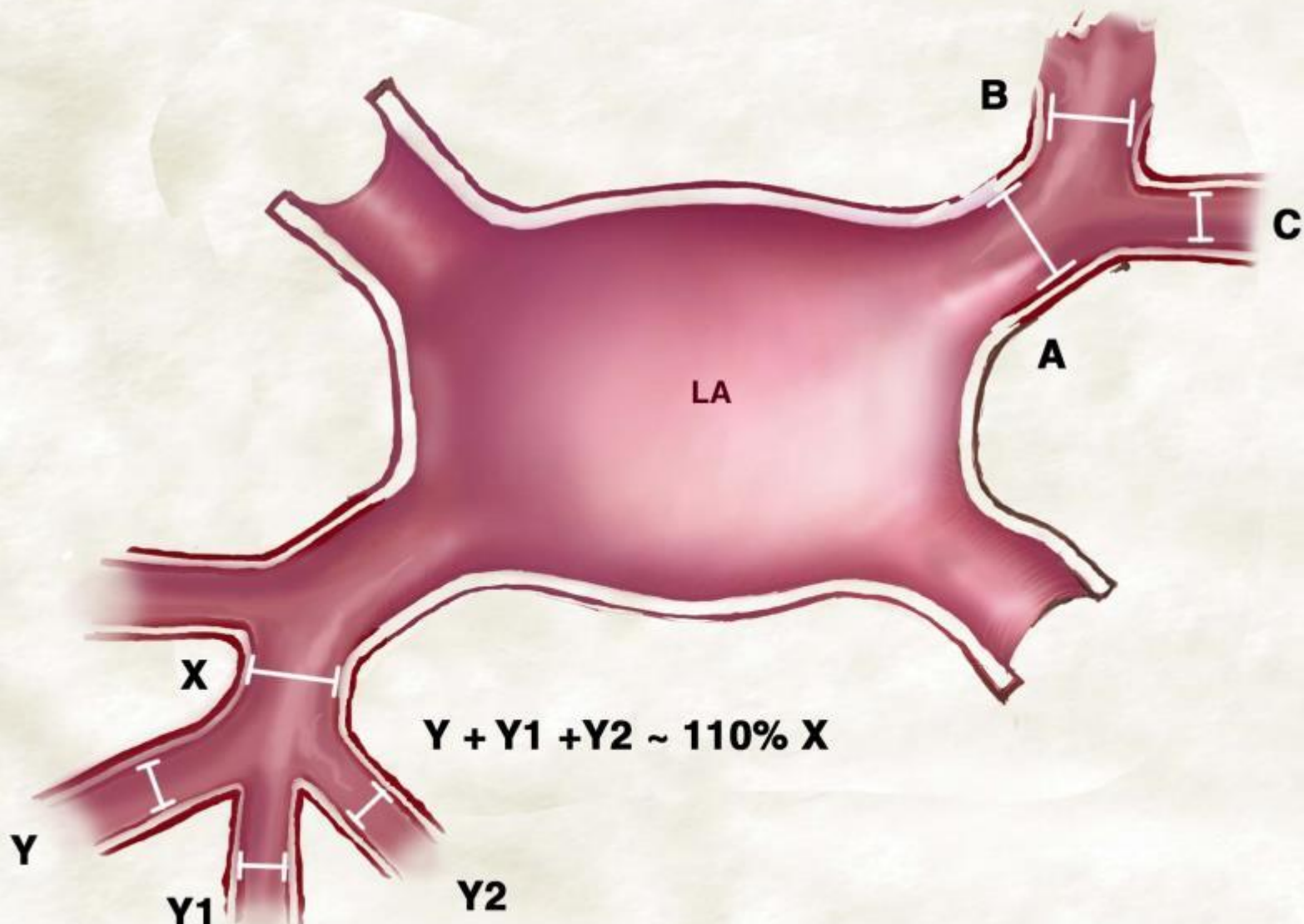
11:00:00 AM

# Ablation Guidance: Mapping



# RELATIONSHIP OF PULMONARY VEIN BRANCHES TO THE PARENT TRUNK

$$B + C \sim 110\% A$$



LA

B

C

A

X

$$Y + Y1 + Y2 \sim 110\% X$$

Y

Y1

Y2

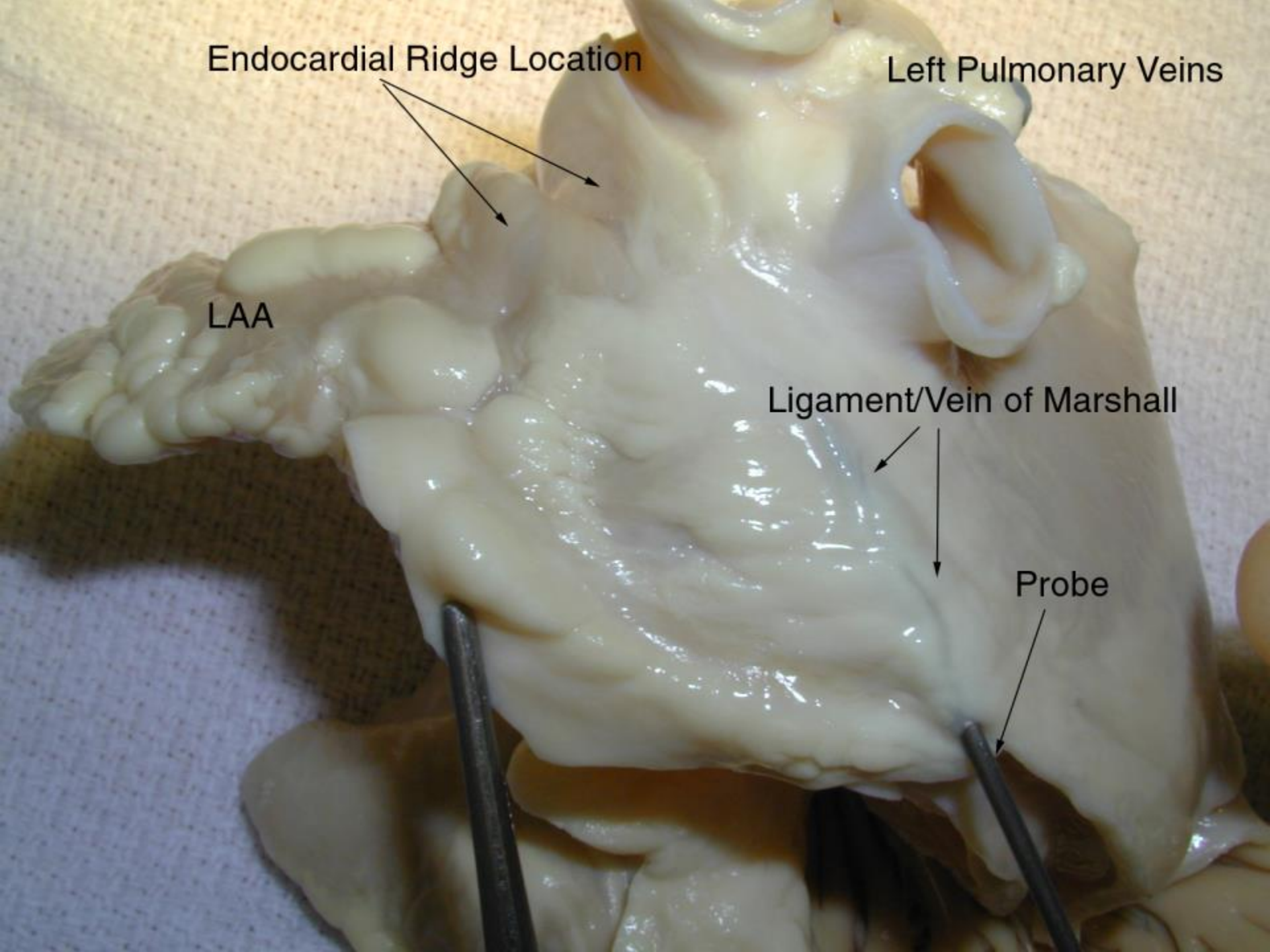
Endocardial Ridge Location

Left Pulmonary Veins

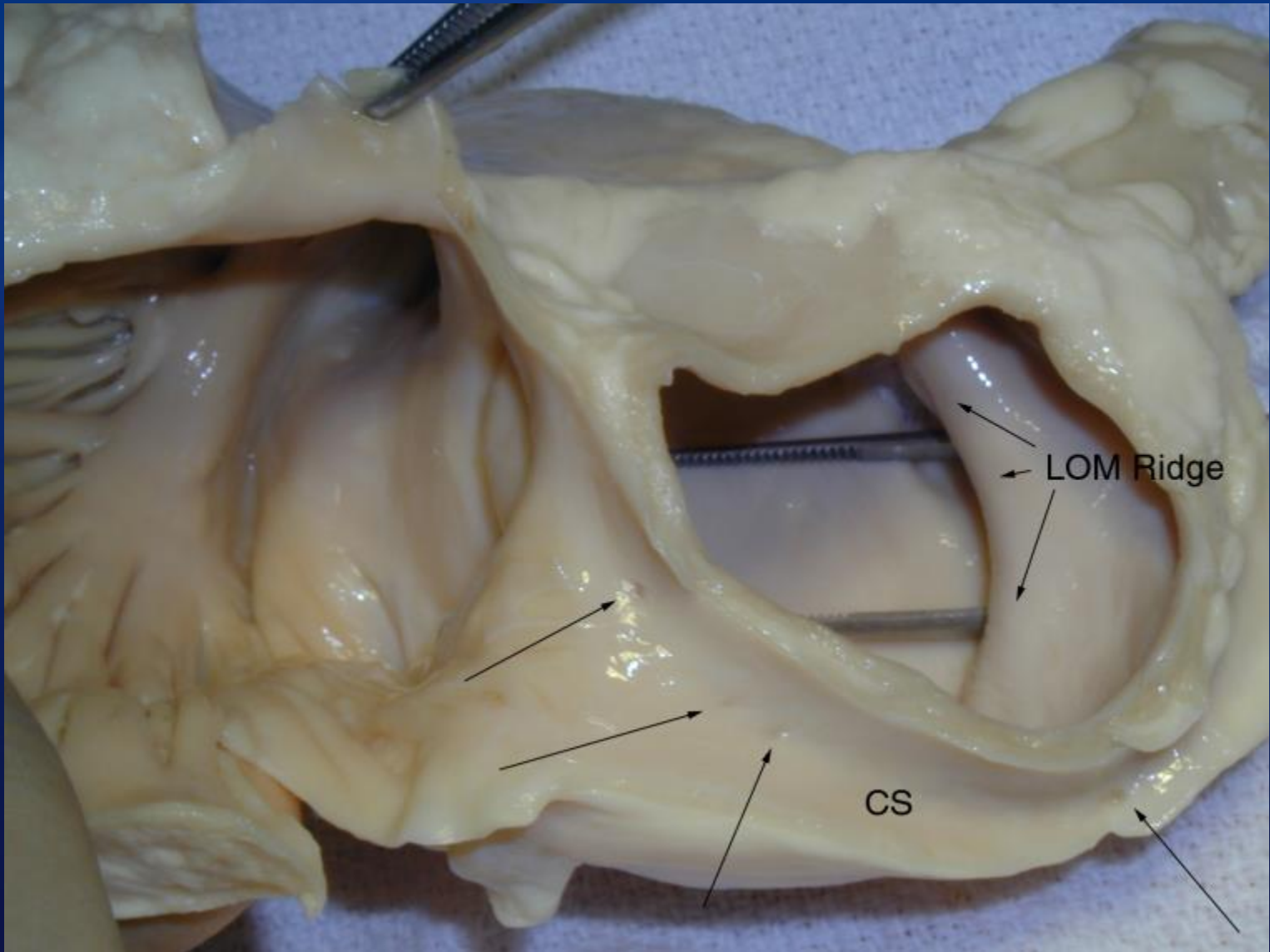
LAA

Ligament/Vein of Marshall

Probe





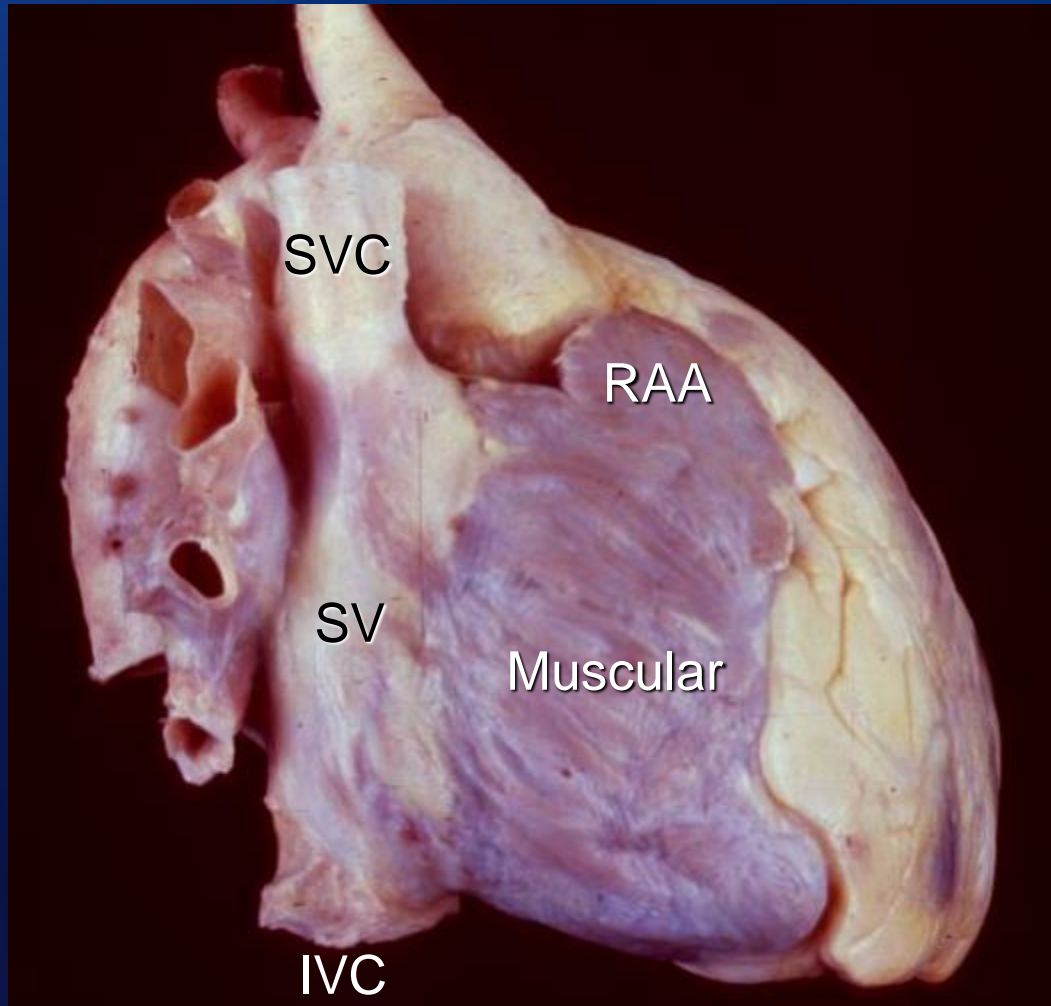


LOM Ridge

CS

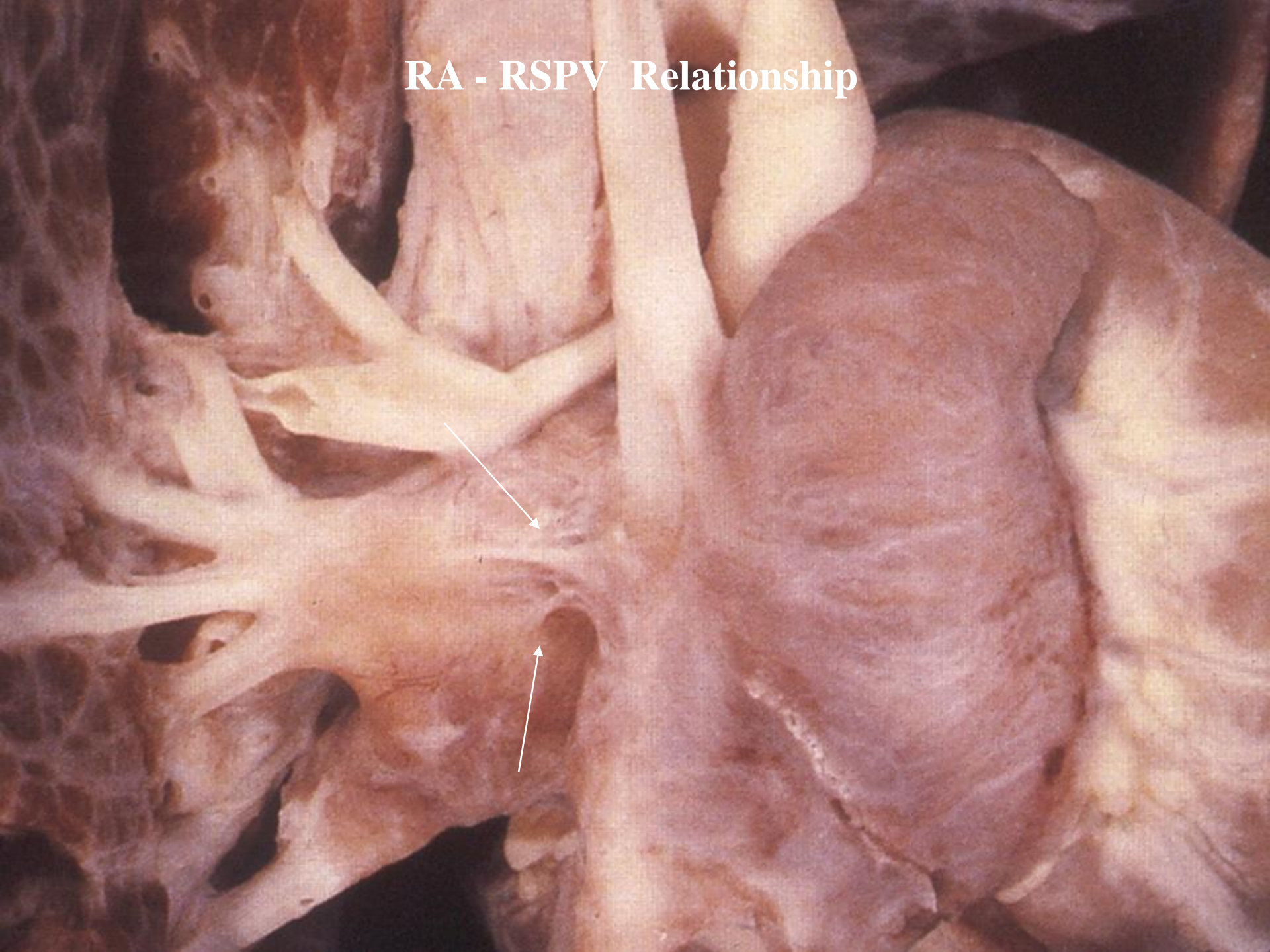
# Normal Heart

## External Topography

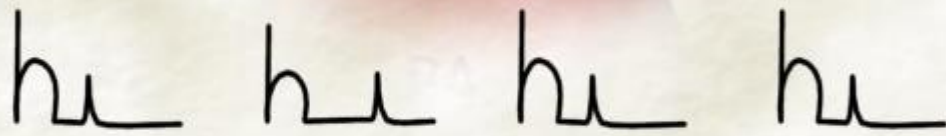
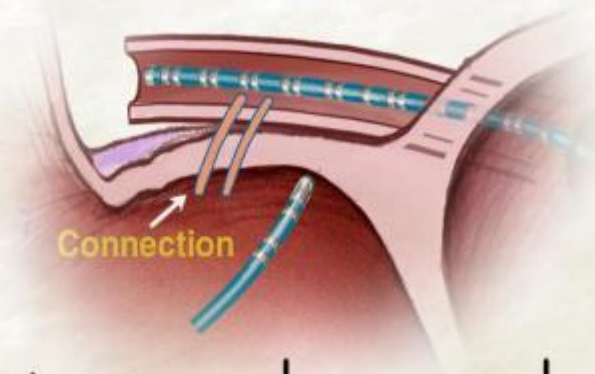


Right Lateral View

# RA - RSPV Relationship

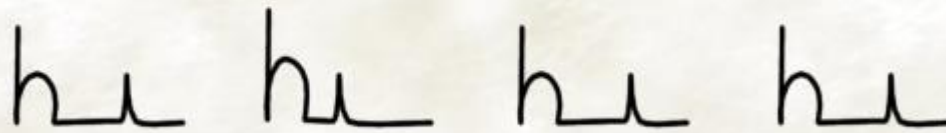


# "PARA-VENOUS" PACING



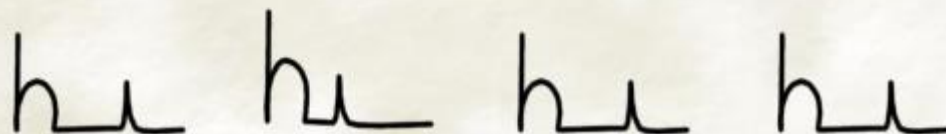
Activation sequence unchanged  
= Pulmonary Vein Potential

---



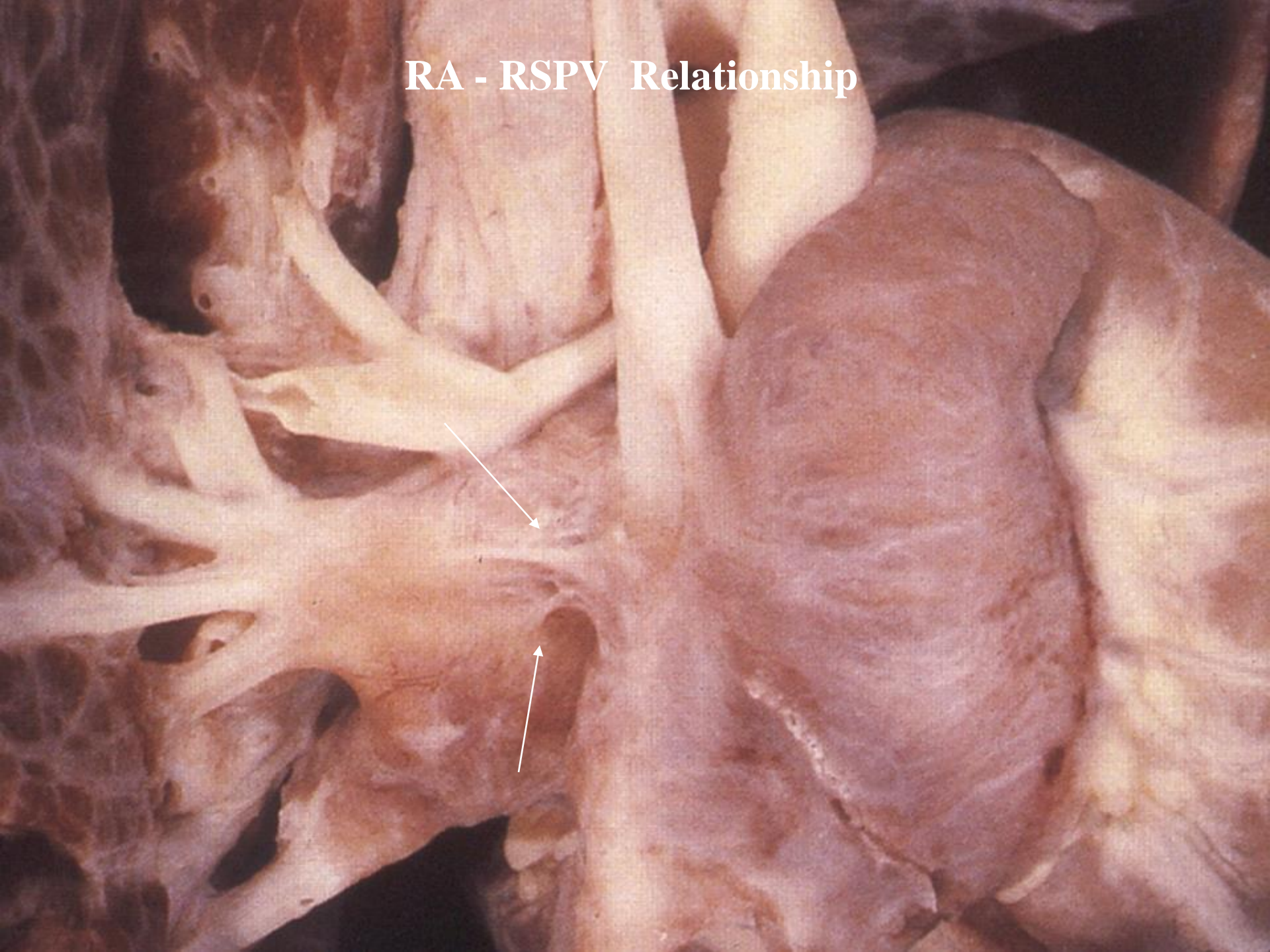
Activation sequence changed  
at high and low output and  
independent with pacing site  
= connection

---

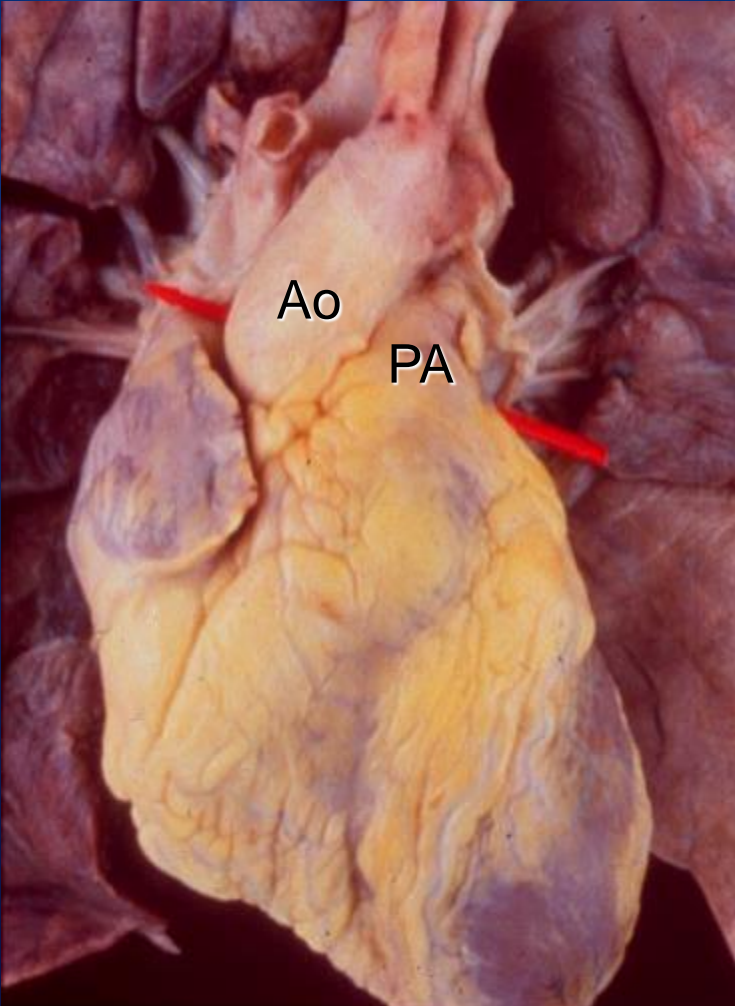


Activation sequence changed  
at high output only and  
"moves" with pacing site  
= farfield capture

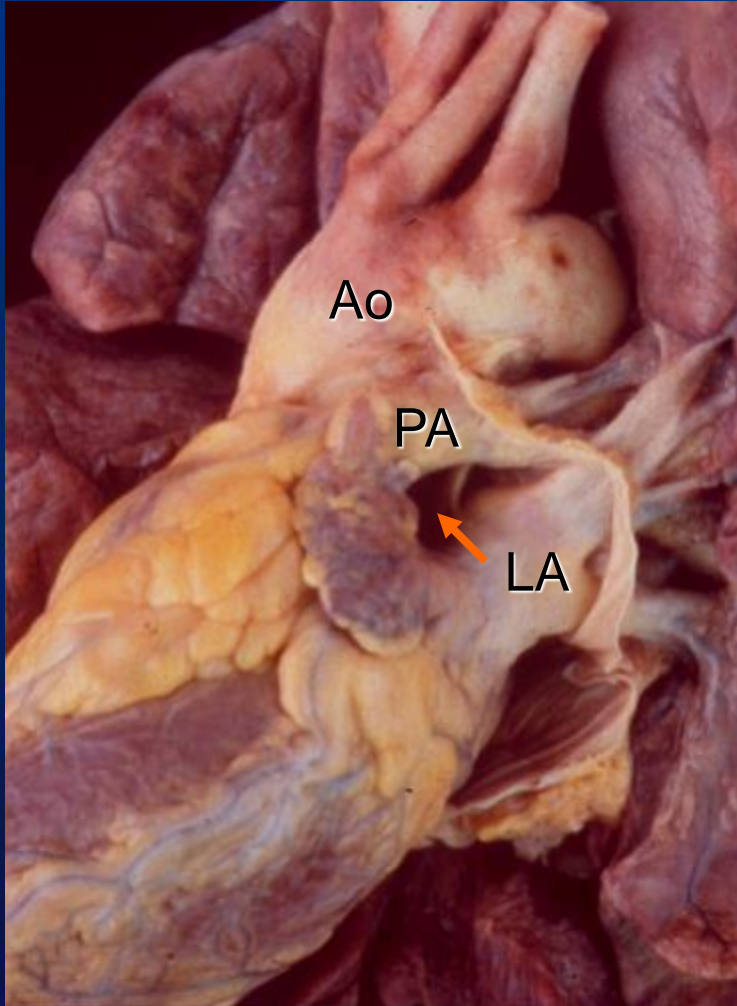
# RA - RSPV Relationship



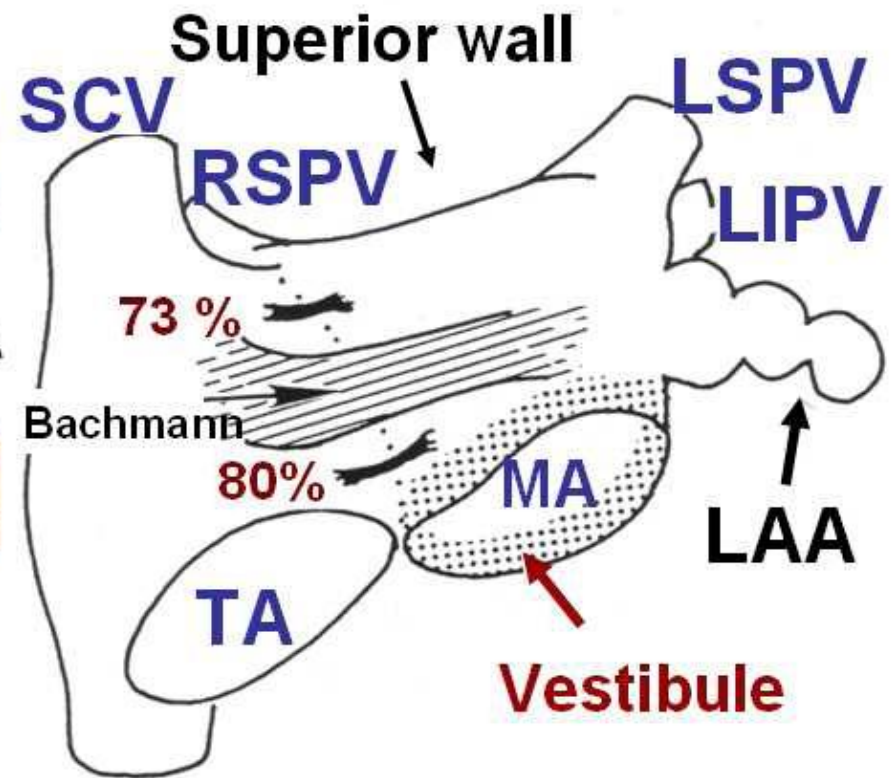
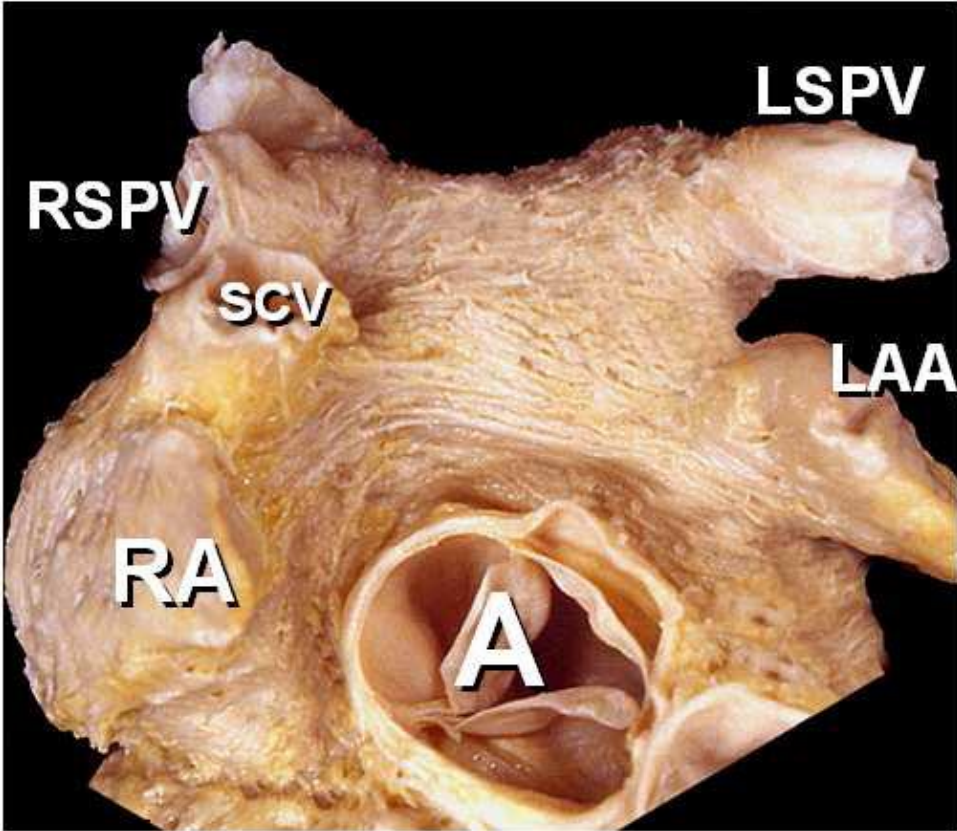
# Normal Heart Transverse Sinus

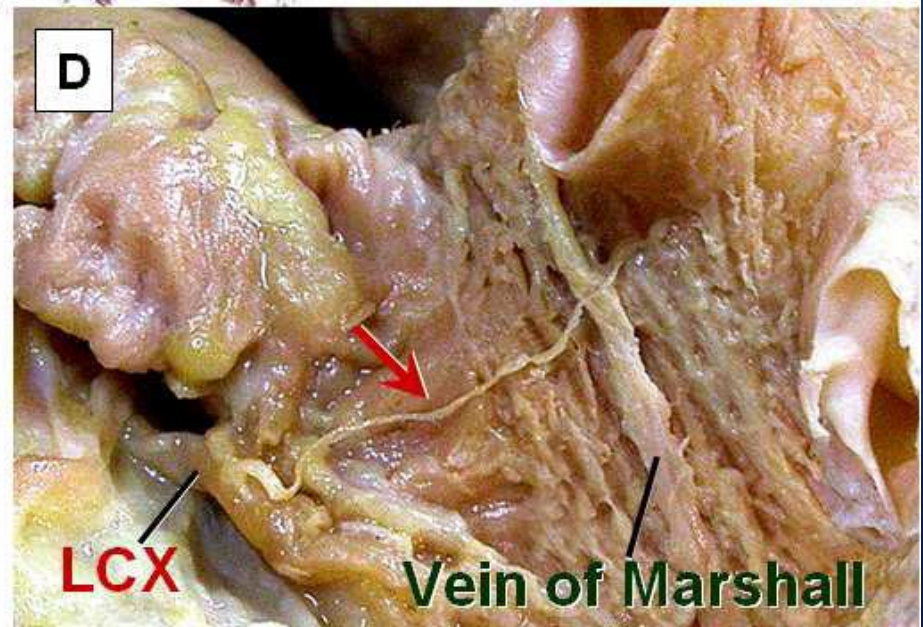
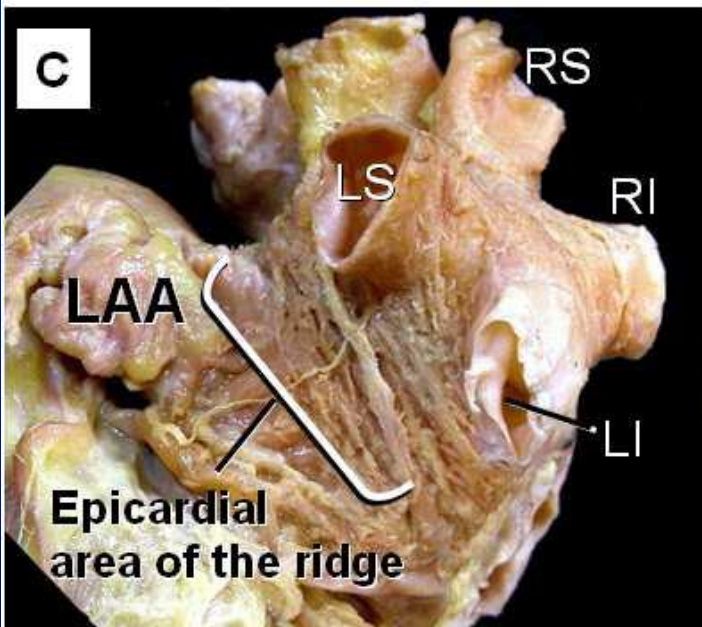


Anterior View



Left Lateral View

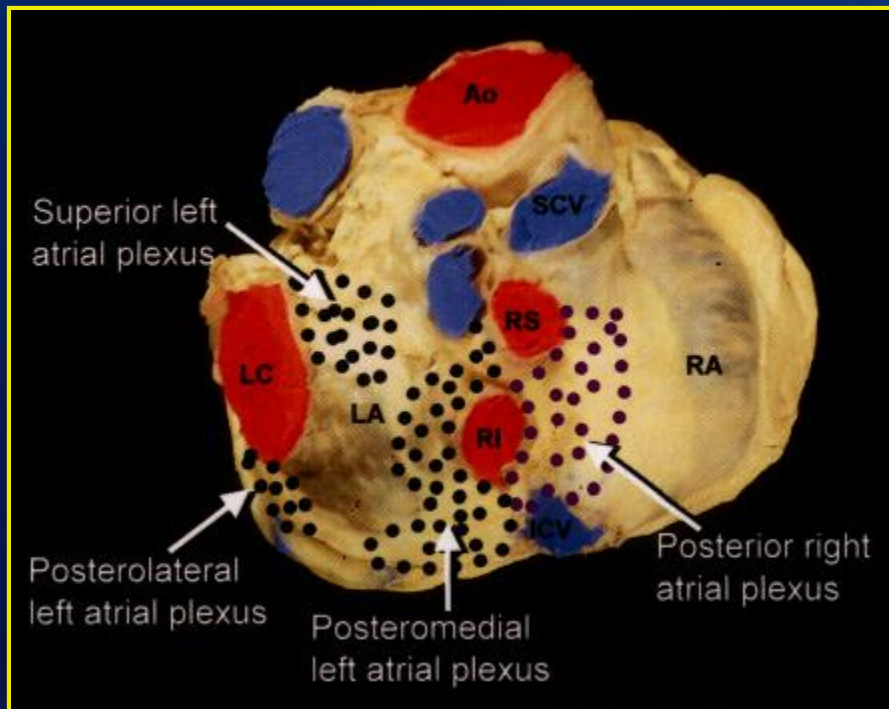
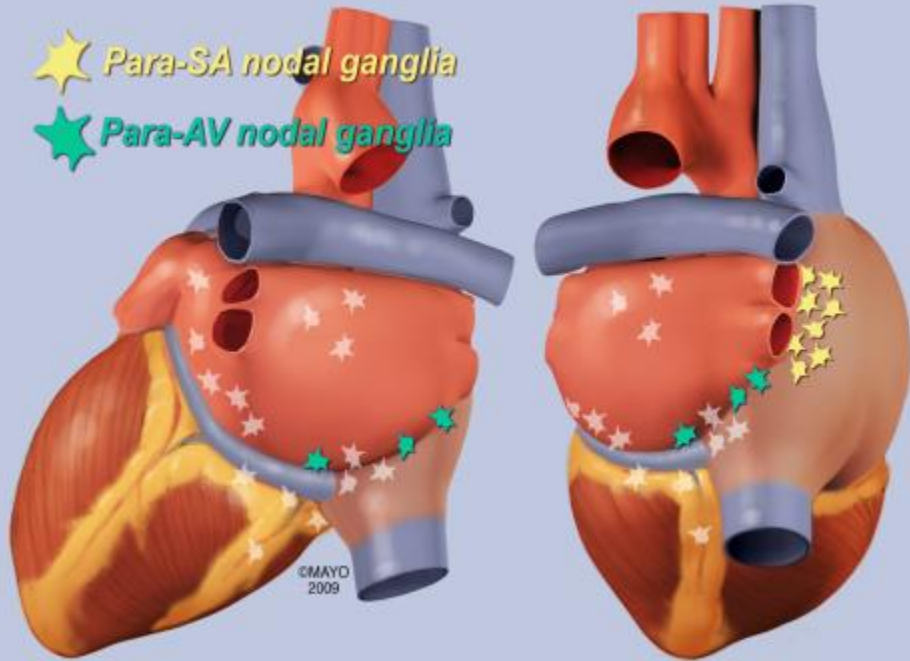


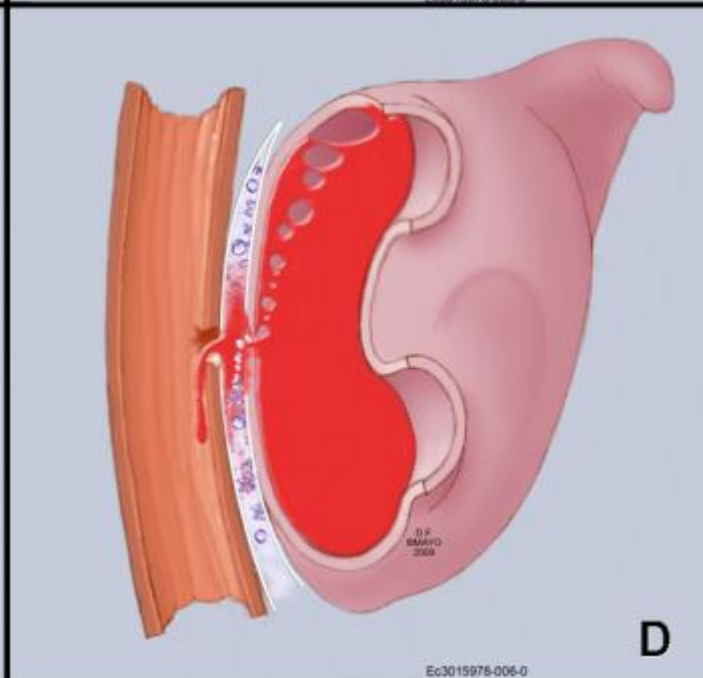
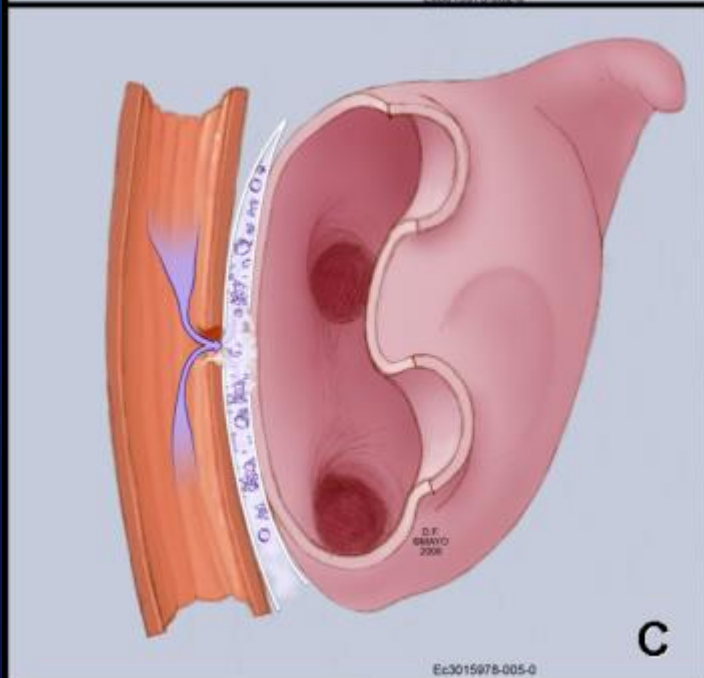
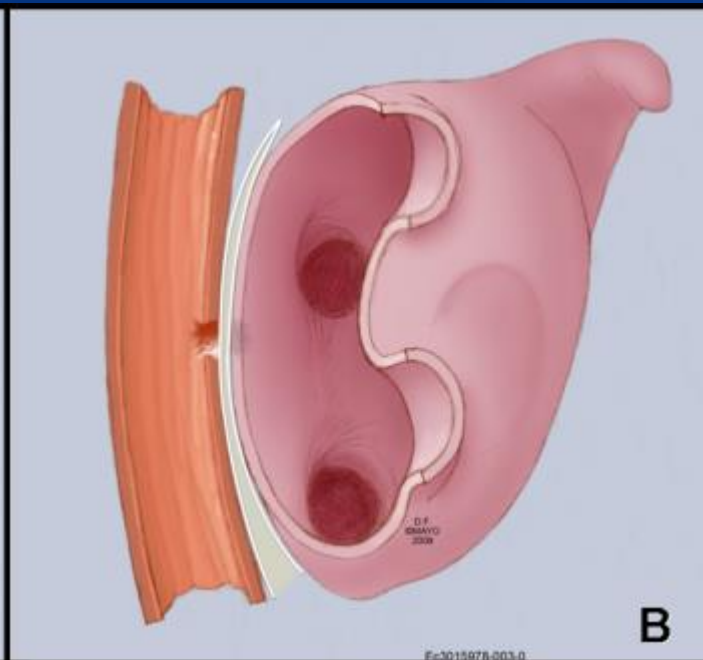
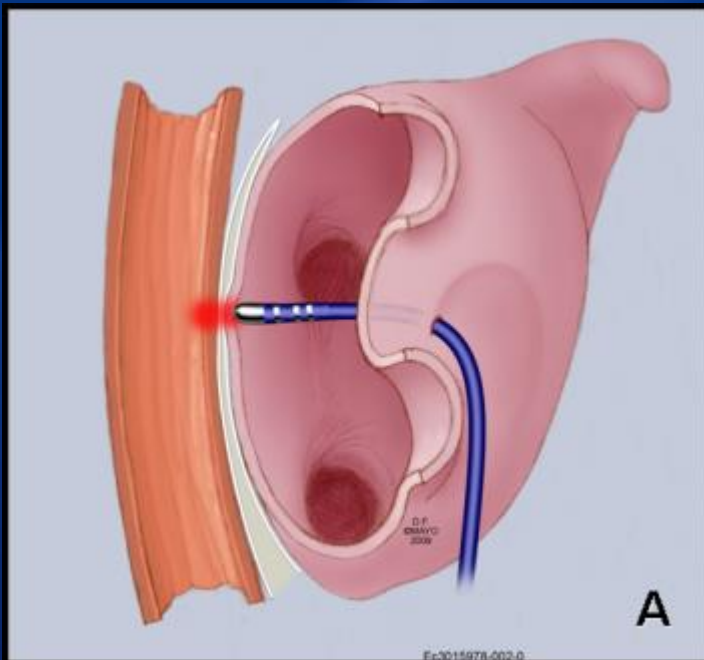


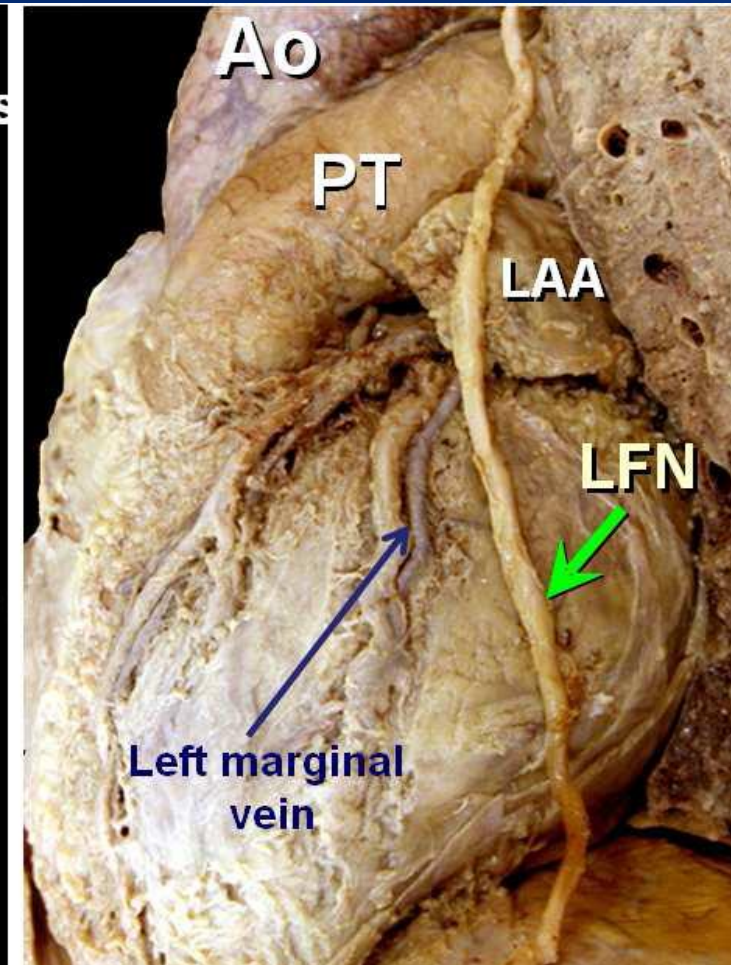
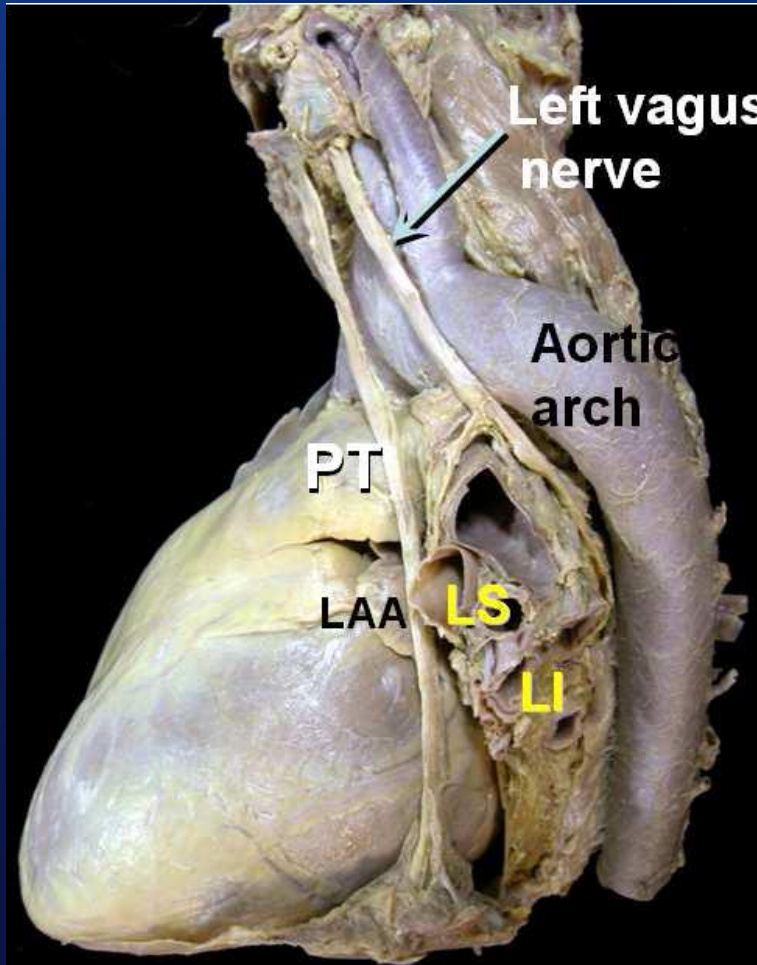


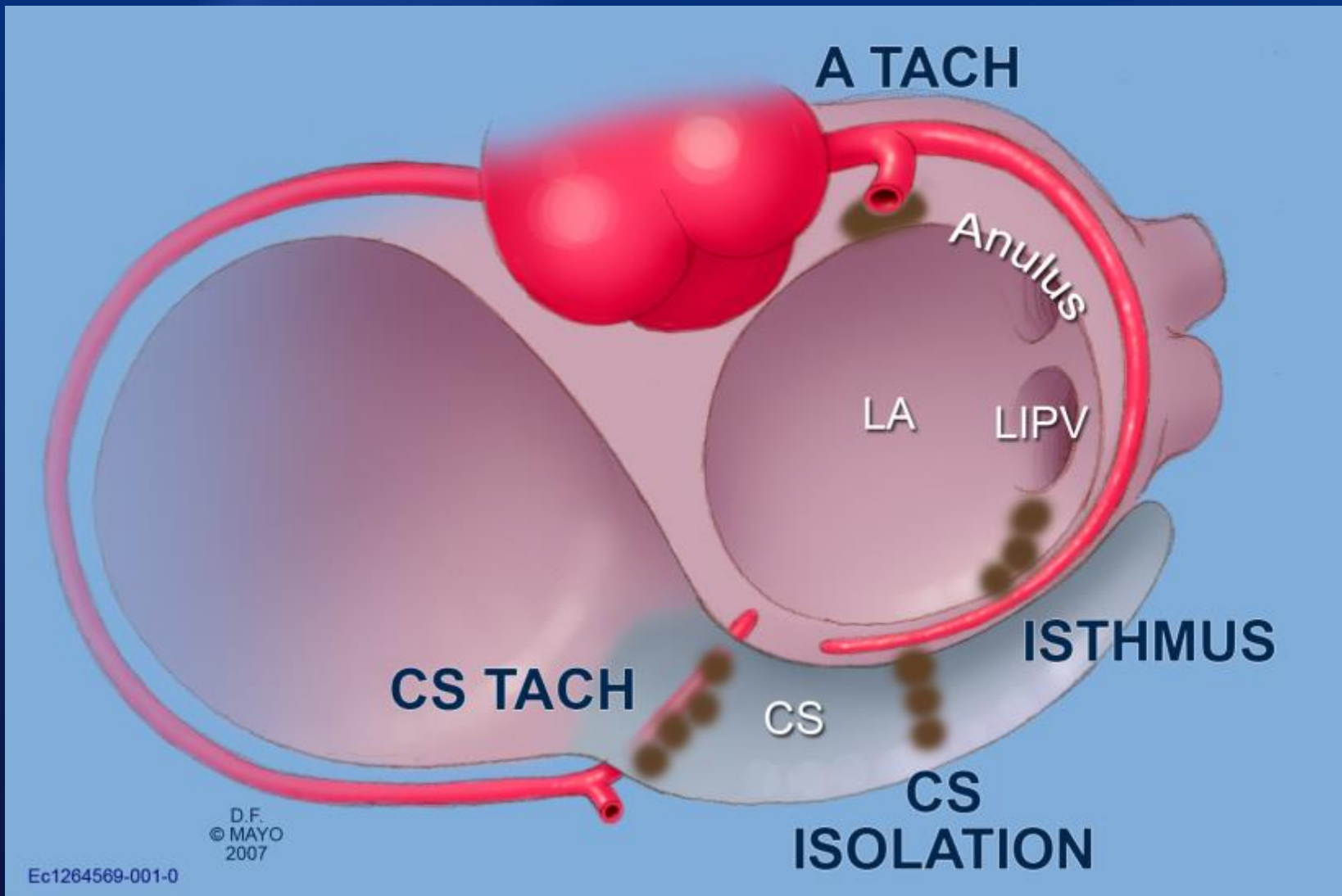
★ Para-SA nodal ganglia

★ Para-AV nodal ganglia











# LA Anatomy: What Should We Know



Samuel J. Asirvatham, M.D.  
Mayo Clinic – Rochester  
AF, VT, VF Summit – Chicago, Illinois  
Saturday, December 7, 2019: 7:55 to 8:20 a.m.