

①

How to do the Pacer Make Call?

1) Before we do

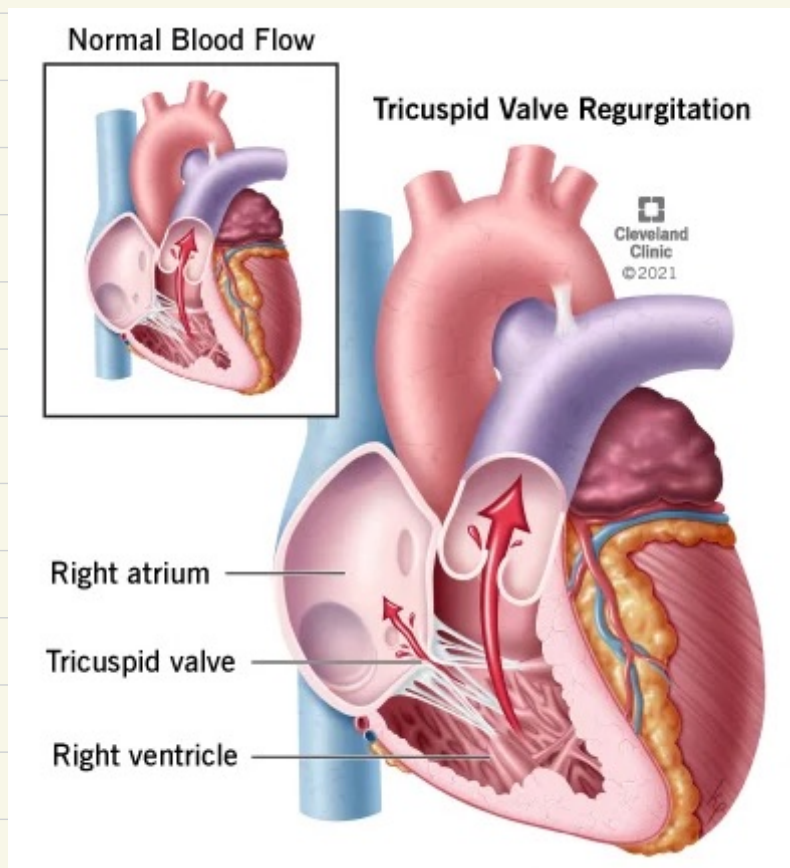
① need to see Patient Rhythm

→ like ECG

→ if CHB (or) SSS

② Echo Report

→ TR is Presence (or) not



The Tricuspid Valve doesn't closed properly so the blood flows backward and so the lead will be displaced.

②

## Sheath.

→ sheath have

- Peelaway sheath
- Introducer (Dilator)
- Guide wire
- Syringe
- needle

if Contrast done Pocket Make before the Puncture.

if Contrast not done → Don't go for direct Pocket opening.

↓  
who

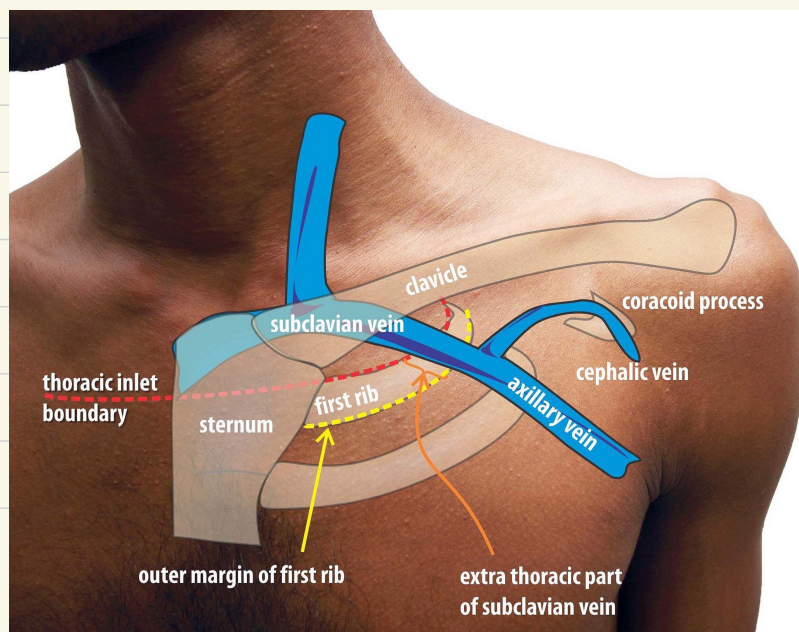
May Be SVC → Collateral

→ Stenosis

→ ASVC

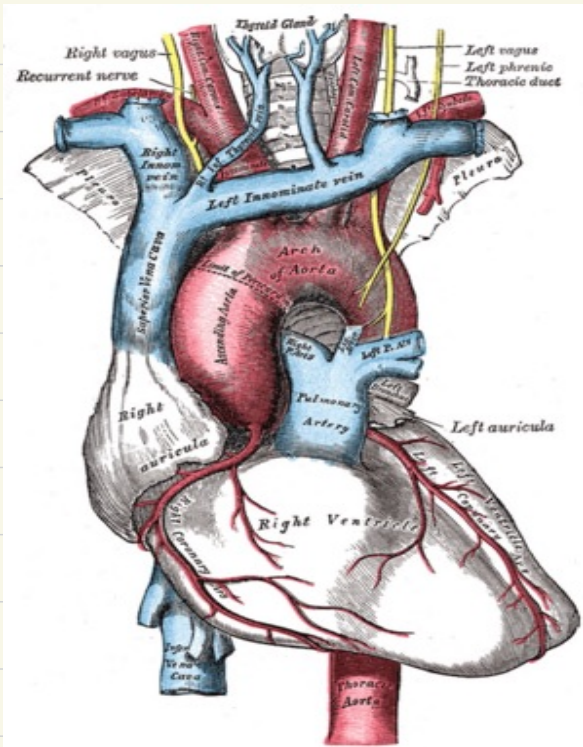
Puncture should be → Extra Thoracic.

→ not Intra Thoracic

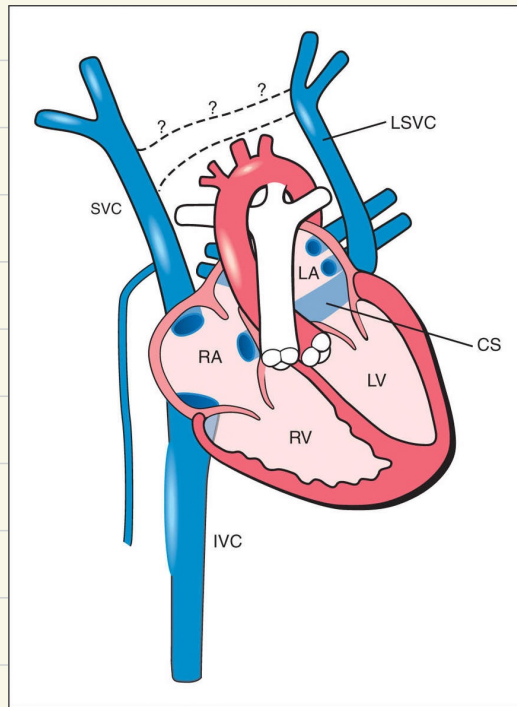




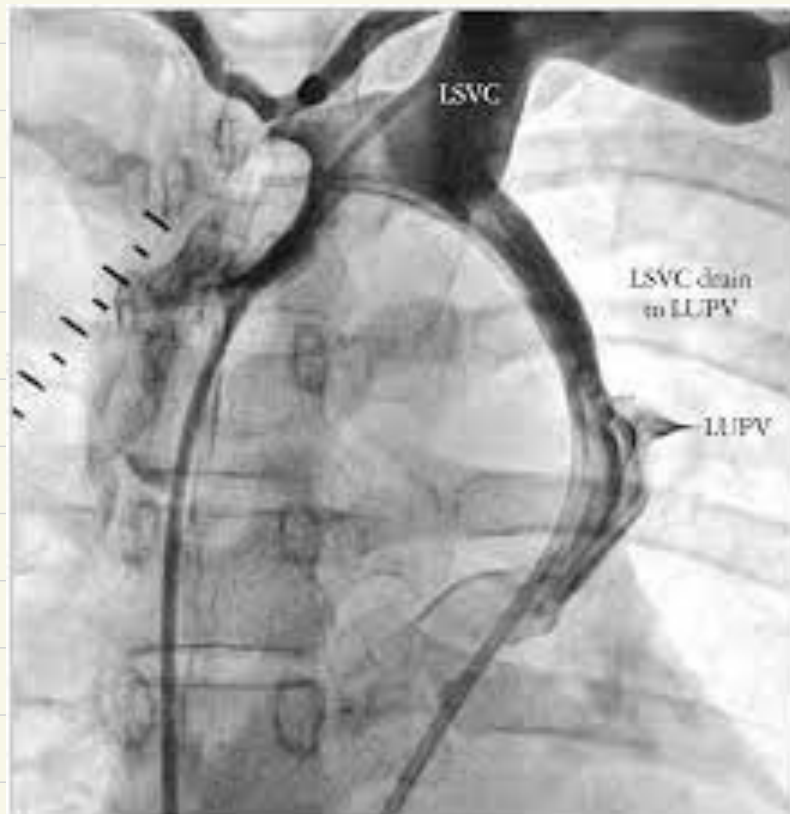
LSVC



normal SVC



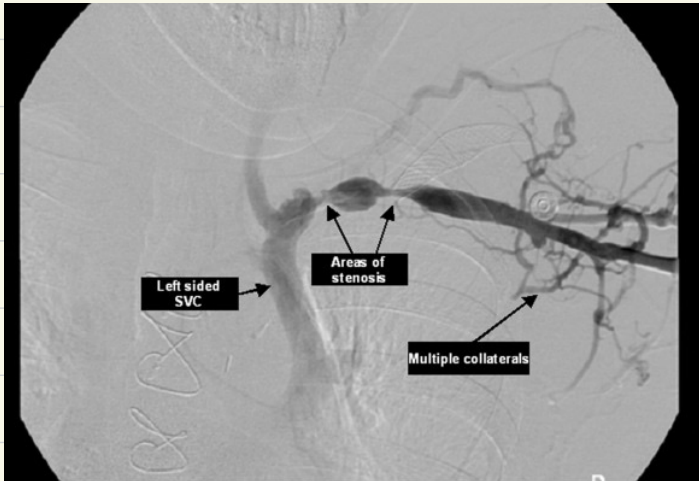
LSVC



→ Fluoro Image

Collaterals

stenosis.



# Puncture

1. Sub Clavin Puncture.

2. Cephalic vein Puncture (Cut-down Method)

## 1. Sub Clavin Puncture

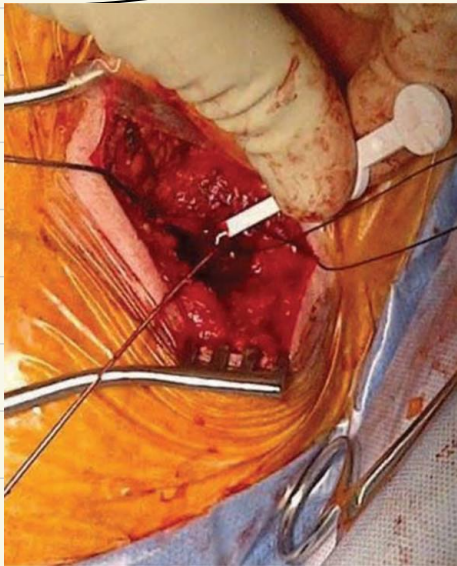
→ For Regular & healthy we, Can use  
Thor Puncture.

If vein not getting Means we  
use Micro Puncture to get a vein

why we use Micro Puncture?

Arteries & vein are placed in very near place.  
if Micro Puncture hit easily for one vein/arteries.

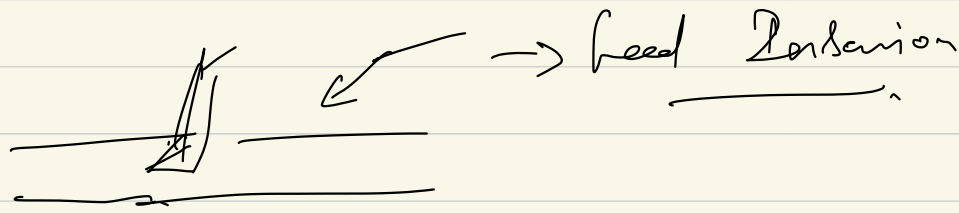
## 2. Cephalic Vein Access.



→ Surgeon only can do  
→ For EP doctor only can  
→ using Material in  
vein lumen → Tip in  
Lead Box



once the Surgeon find the vein they lift the vein like this



Pocket Size

→ Pocket size will be size of three fingers.

Sheath Procedure

Before Contrast & TPD

Insertion (Puncture)

↓

Guide wire → should cross IVC

↓

after Pocket

↓

Dilator with sheath

↓

Remove Dilator & Guide wire

↓

finally lead

↓

Put the sheath.



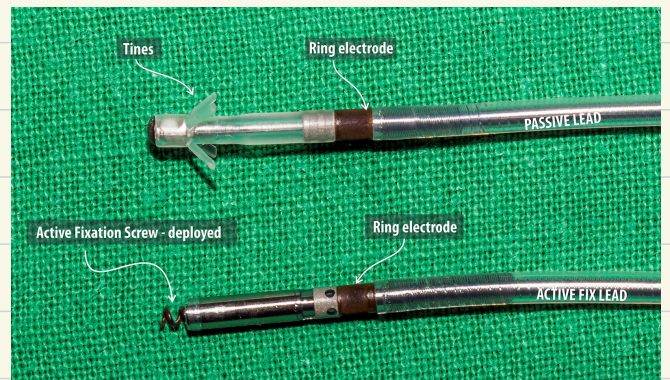
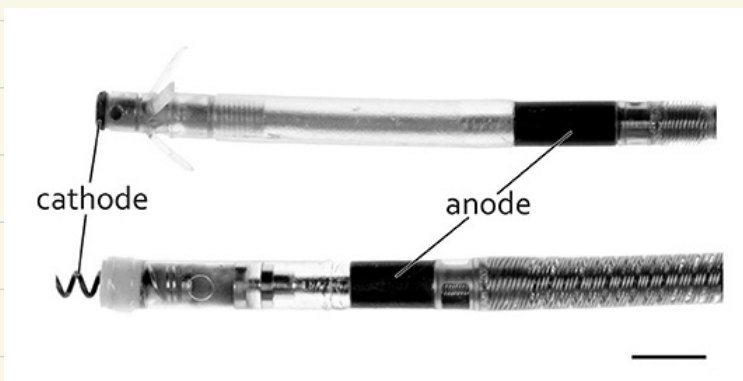
# Lead

Two type of lead

→ Tin lead (Passive lead)

→ Just hold in the fibrous tissue

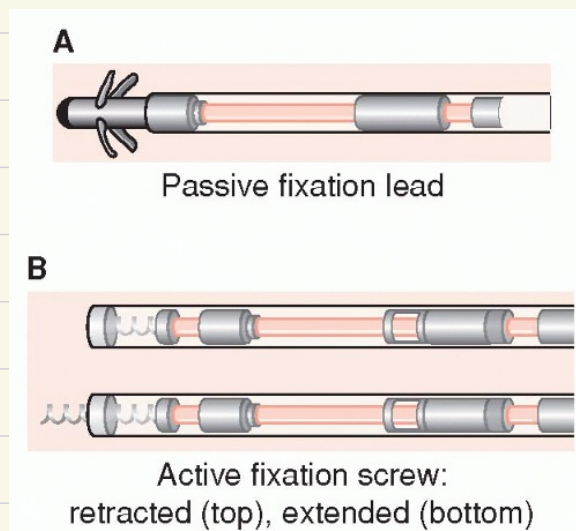
→ It's called Passive fixation



→ Screw in lead (Active lead)

→ we should give the torque to screw out

→ It's called Active fixation





Screw turns  $\rightarrow$  8- to 12 Clockwise  
Rotation  $\rightarrow$  pull out the screw

what happen lead fixed

Tin lead  $\rightarrow$  Nothing happen.

if screw in lead

what we should see

- ①  $\rightarrow$  screw properly out  $2\frac{1}{2}$  screw should out  
 $\rightarrow$  W shape on fluoros & space should see



②

$\rightarrow$  Impedance Drop

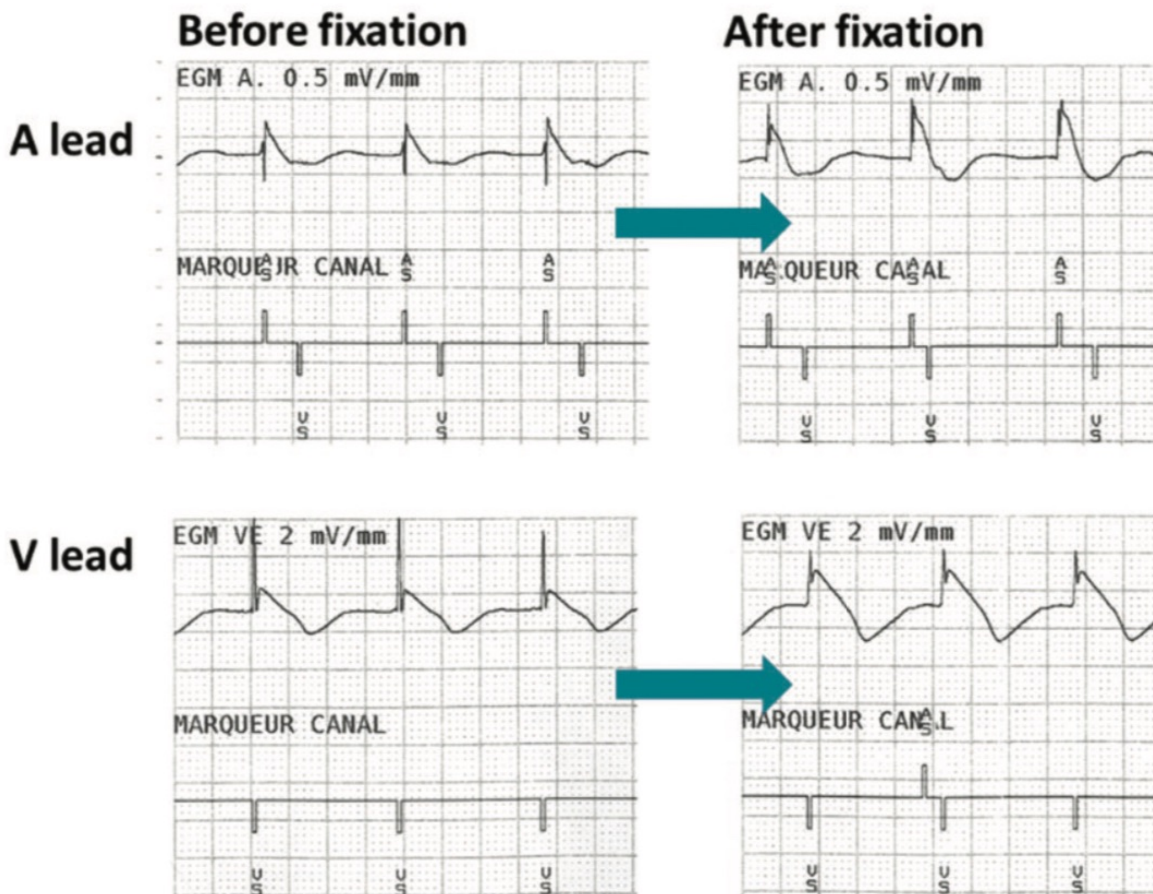
(Before screw in Impedance  $\uparrow$   
after screw in Impedance  $\downarrow$ )  $\rightarrow$  1200  $\sim$   
 $\rightarrow$  600  $\sim$

## ② Current of Injury.

→ Screw in means we screw the lead into the Myocardium tissue

→ So the current of delivery is high

→ So the ST elevation will happen in the ECG



**Figure 10** Recordings from the pacing system analyser at implantation. Increase in current of injury before (left) and after (right) helix deployment. Top: atrial (A) lead (note absence of a far-field R-wave). Bottom: Ventricular (V) lead.

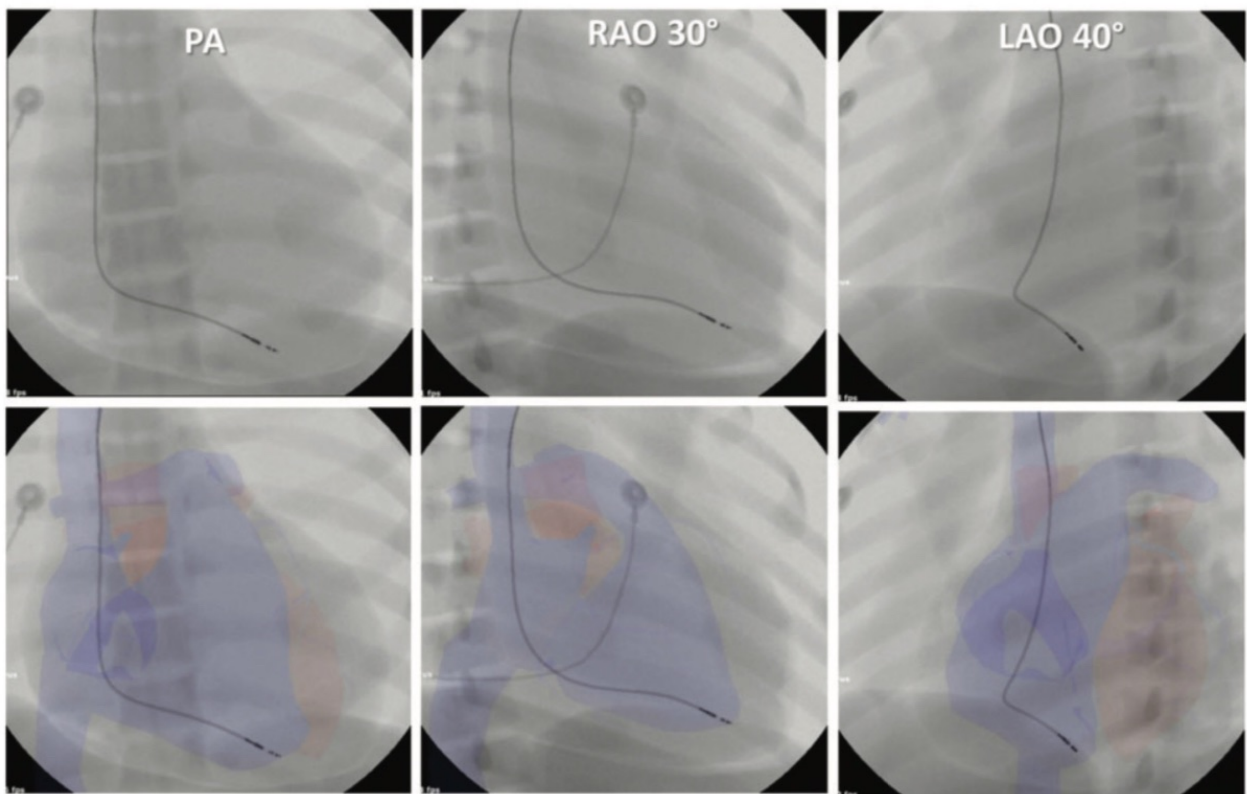
# Lead Box

## Lead Box Content

- Lead
  - stylet → (if RV - 2 Non straight)
  - Vein lifter
  - screw → if screw in
- RA  
- 2 Non straight  
→ 2 Non J shape

## Lead Position.

- ① RV lead (Tin lead) → Apex only we can do



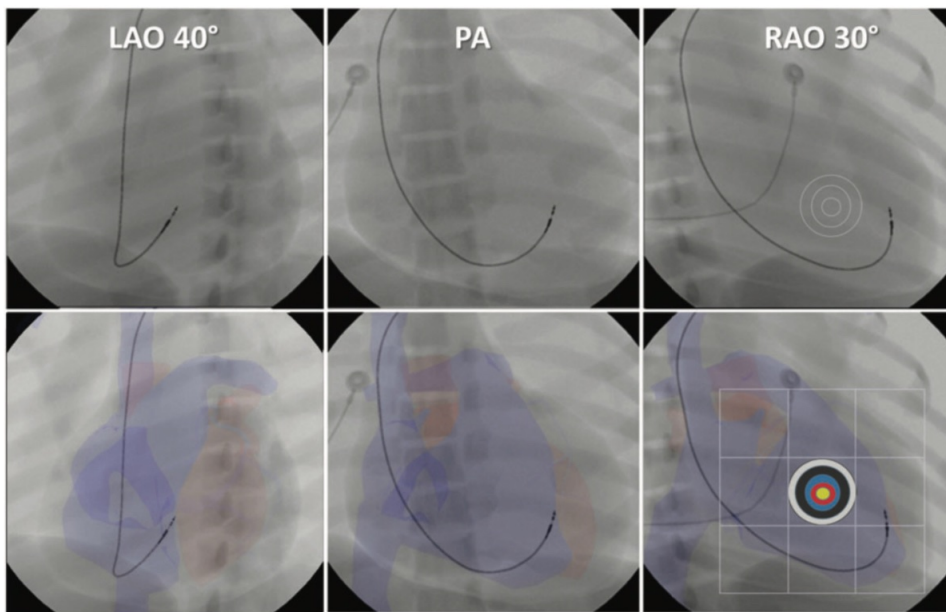
**Figure 7** Lead position in the right ventricular apex. Note how the apical position is more apparent in the right anterior oblique (RAO) 30° view than in the postero-anterior (PA) view. The left anterior oblique (LAO) view allows to rule out placement of the lead in the left ventricle via a septal defect or in a tributary of the coronary sinus (e.g. in a posterior vein). Images modified from a virtual reality simulator used for training device implantation, with anatomy reconstructed from patient CT scans.

② RV screw in lead

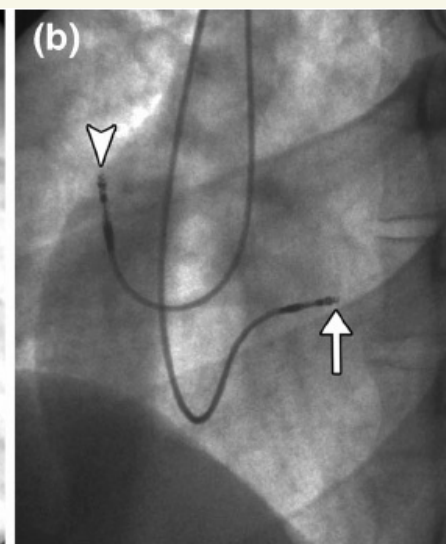
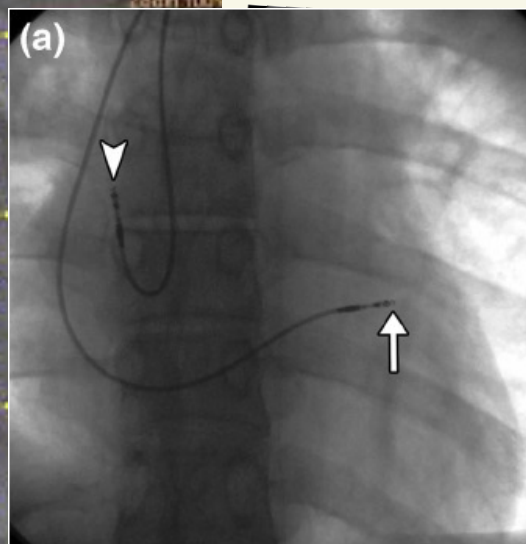
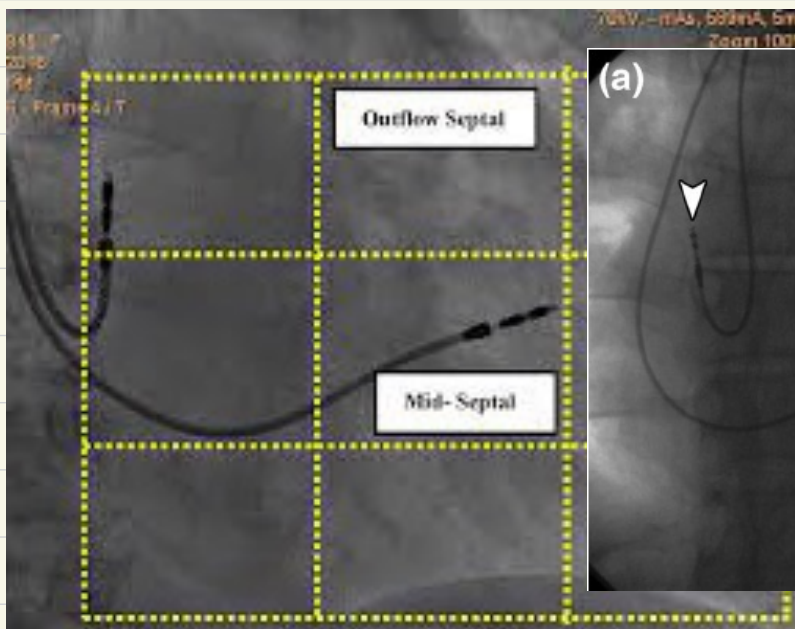
→ RV Septum

ProT (Right Ventricular out Through)

- High Septum
- Mid Septum
- low septum/apical septum

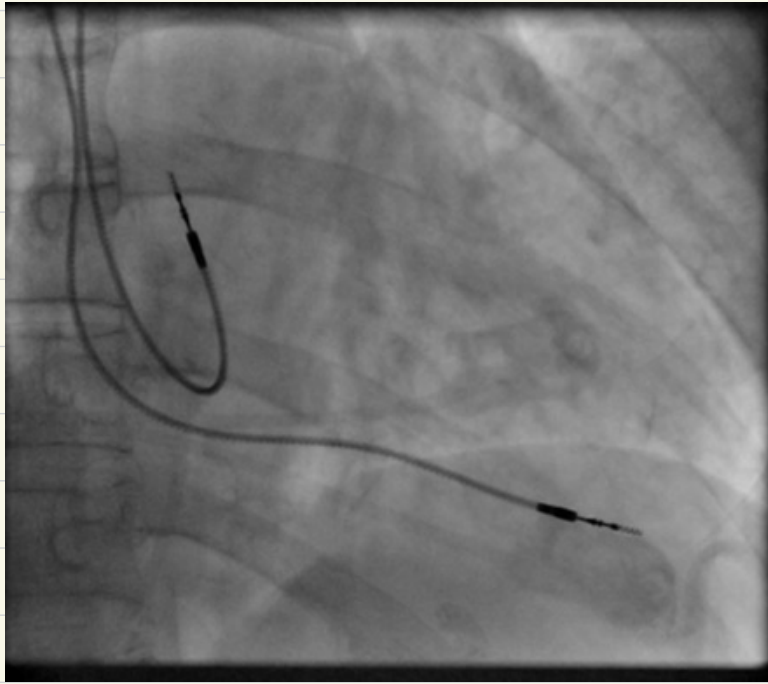


**Figure 8** Fluoroscopic landmarks for right ventricular mid-septal lead positioning. The lead is implanted in the antero-septal groove and masquerades as a septal position in the left anterior oblique (LAO) 40–60° and postero-anterior (PA) views. The Right anterior oblique (RAO) 20–30° view shows that the lead is in fact anterior. A 3 × 3 grid can be drawn from the lateral border of the spinal column to the apex in the RAO 20–30° view, targeting the middle square.<sup>91</sup> Dilatation or hypertrophy of the left ventricle may however modify the cardiac silhouette and the landmark. Images modified from Burri et al.<sup>91</sup>

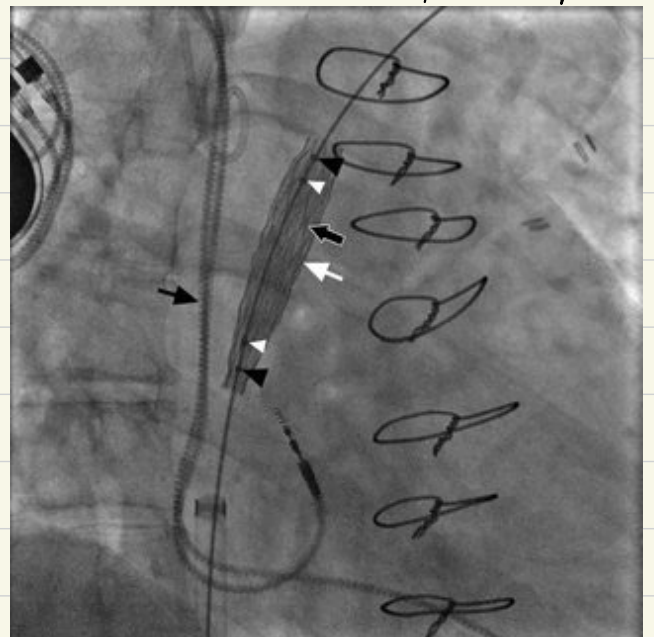
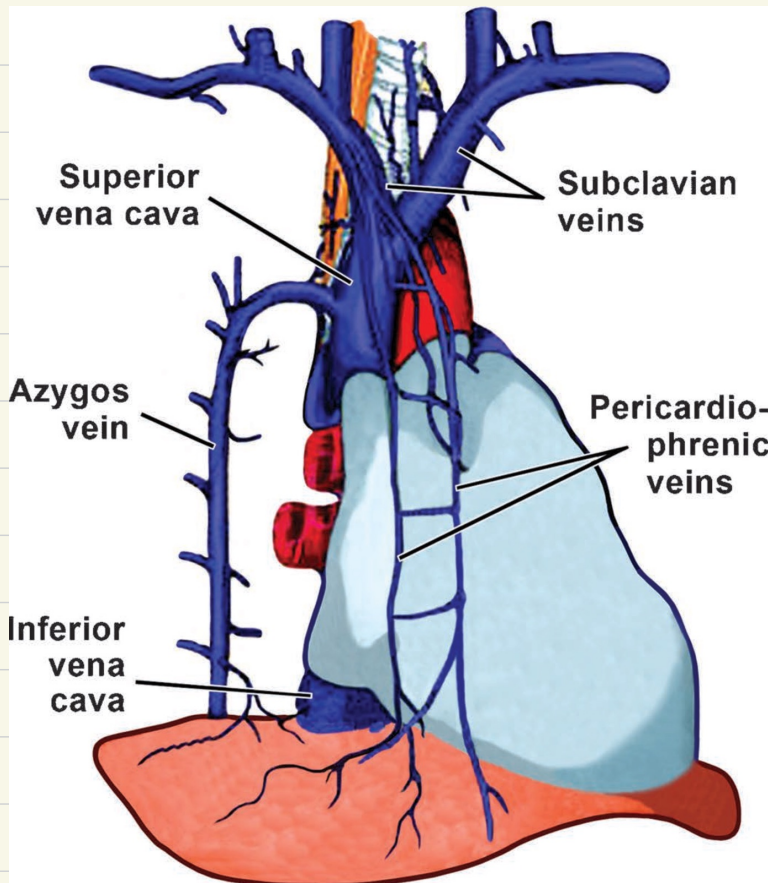




RA lead will be safer for Tin & Screen in  
 Appentage  $\rightarrow$  Pendulum / wiper Moment we can achieve  
 if in The  
 Appentage  
 Position.

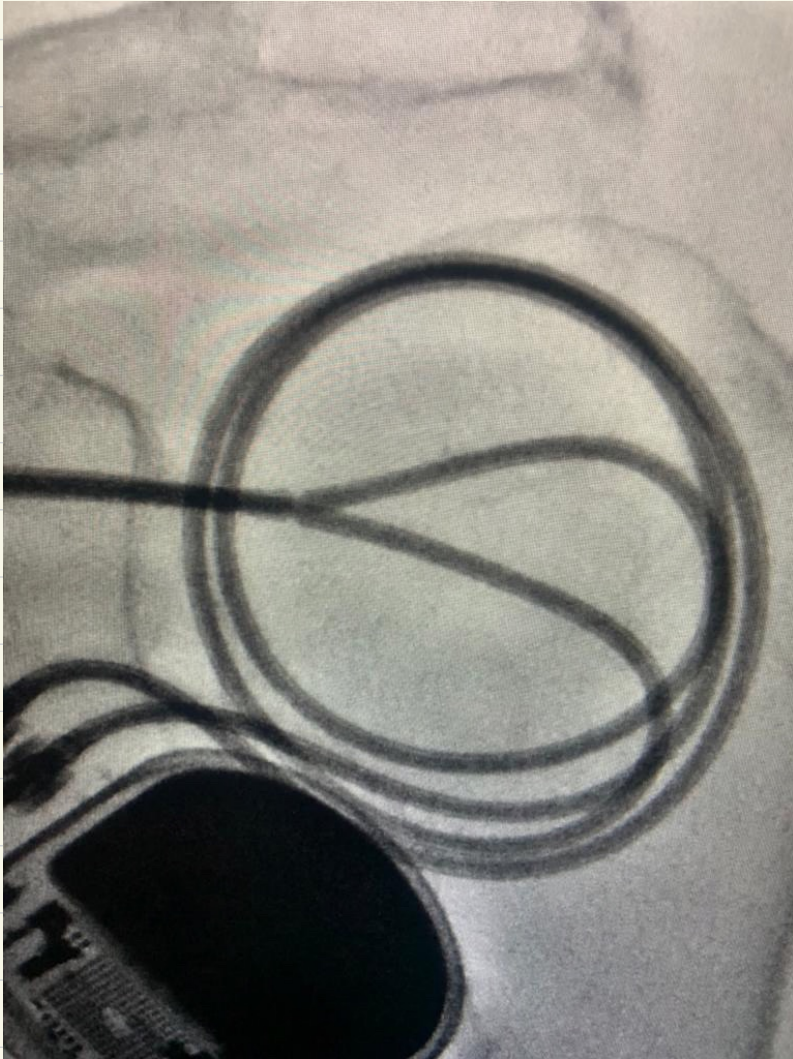


Some time Atrial lead goes into azygos vein  
 we need to Reposition the  
 The (d) high / not capture



Sleeve  
Lead Anchor fixing

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Don't do too much  
of knots

→ If it's loose then

1) lead brake will  
happen

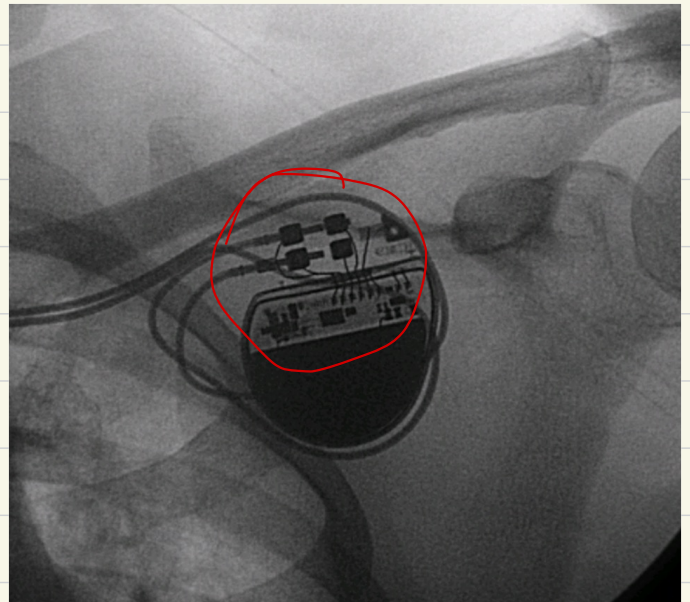
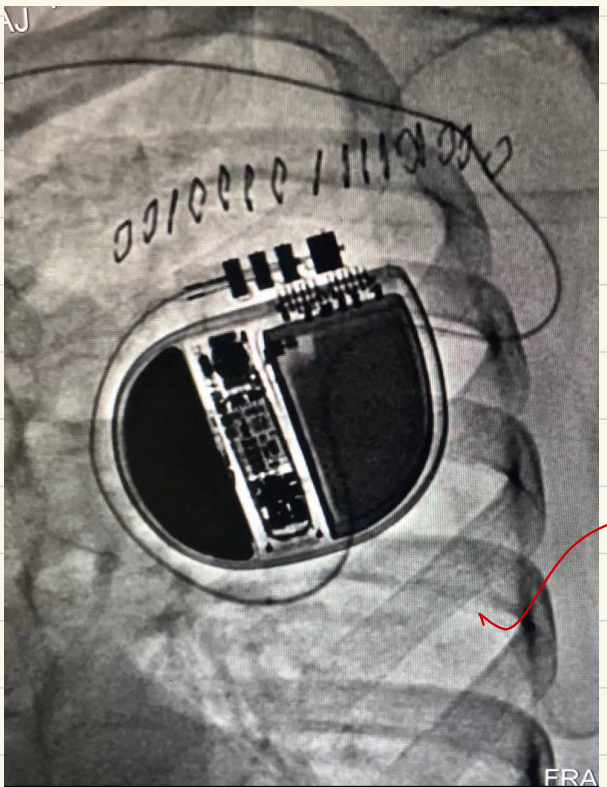
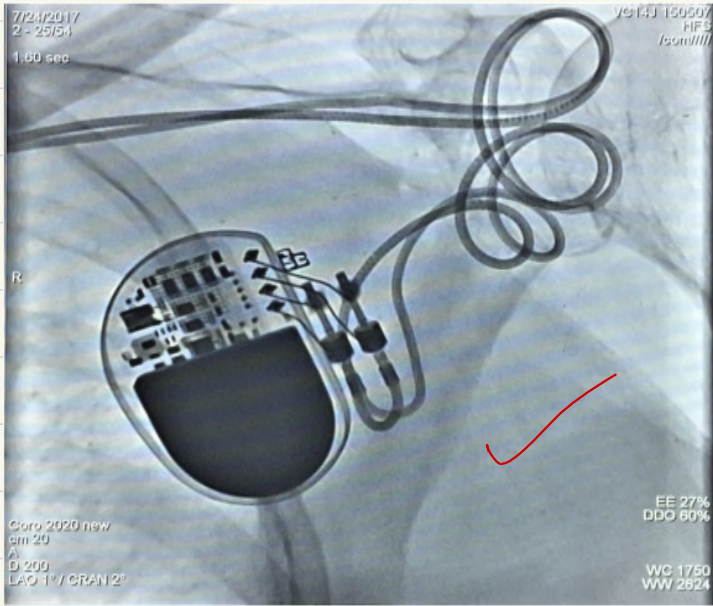
2) Loss of Capture  
will happen

we need to Moderate  
slight with sleeve  
the anchor.



Pace maker fixing

after the lead placement, Pacemaker will  
connect with the lead.  
we should check



Final Fluoro we check -

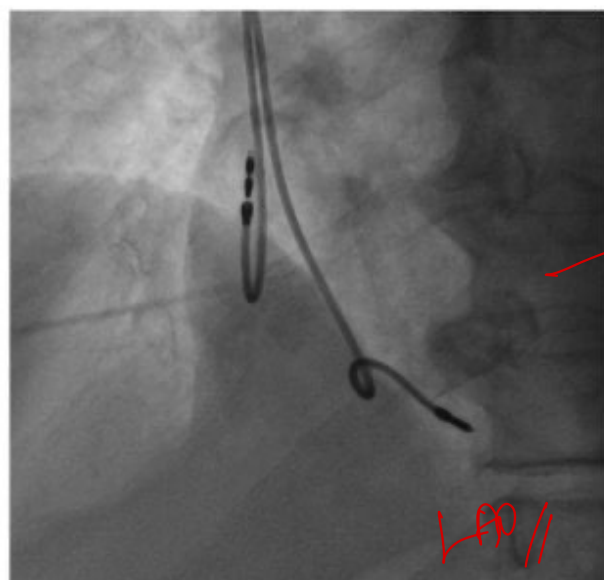
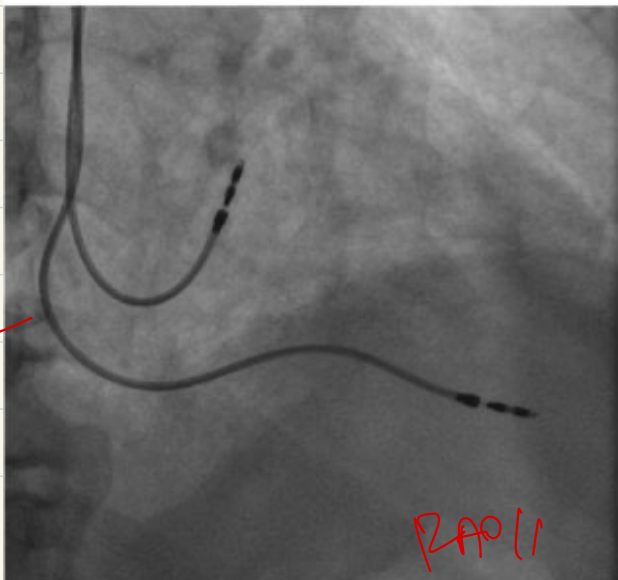
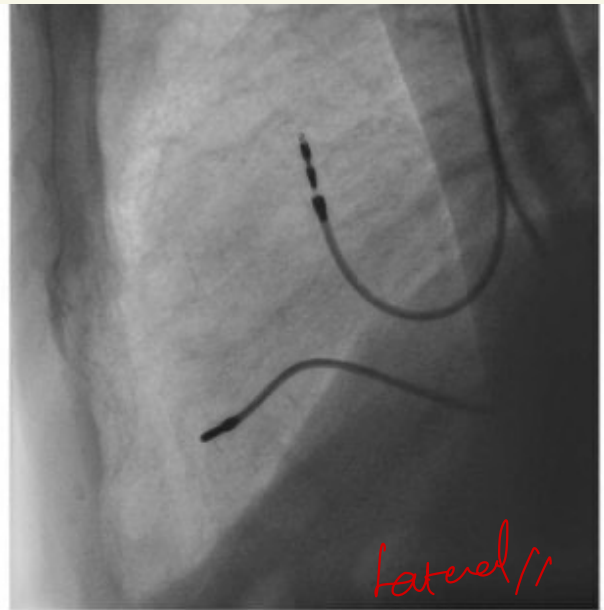
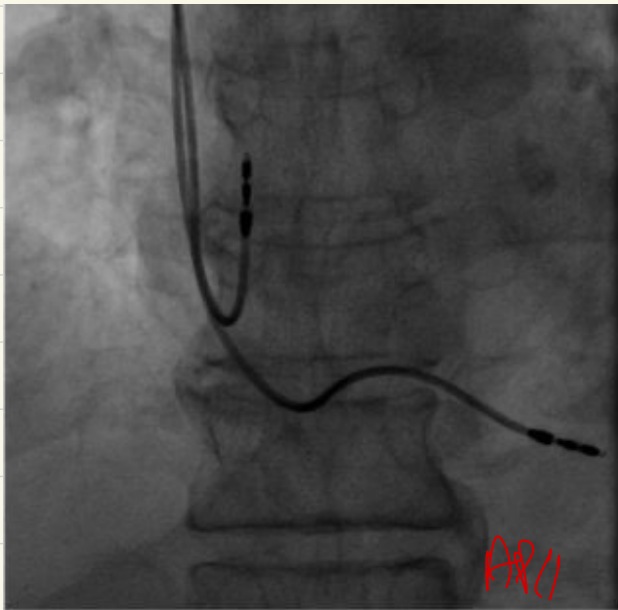
→ Screw Thrown Out

→ Pin Connection Should Perfect

→ Lead under the Battery -

→ RAO, LAO, Lateral, AP

APX i



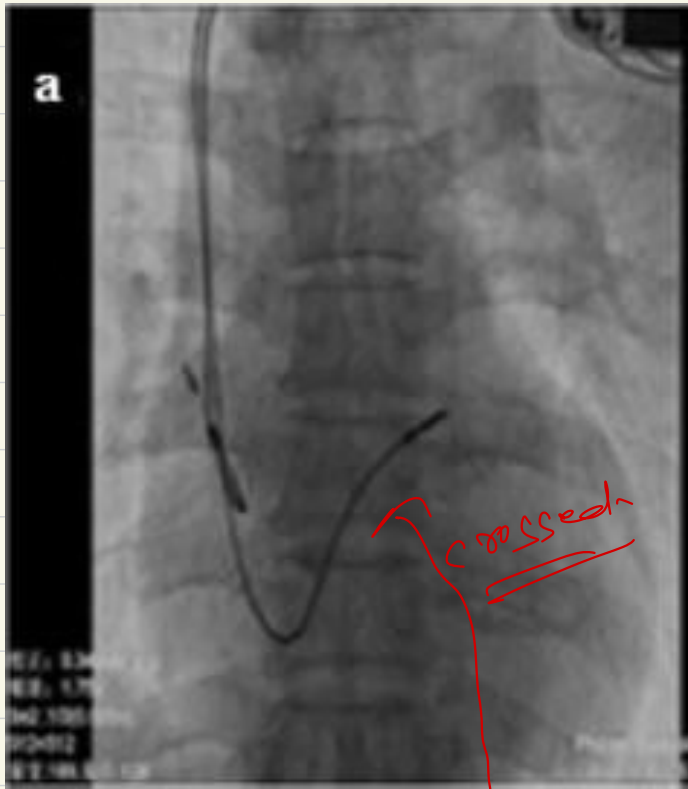
← Baby  
Sitting  
Position

→ opp  
such  
other

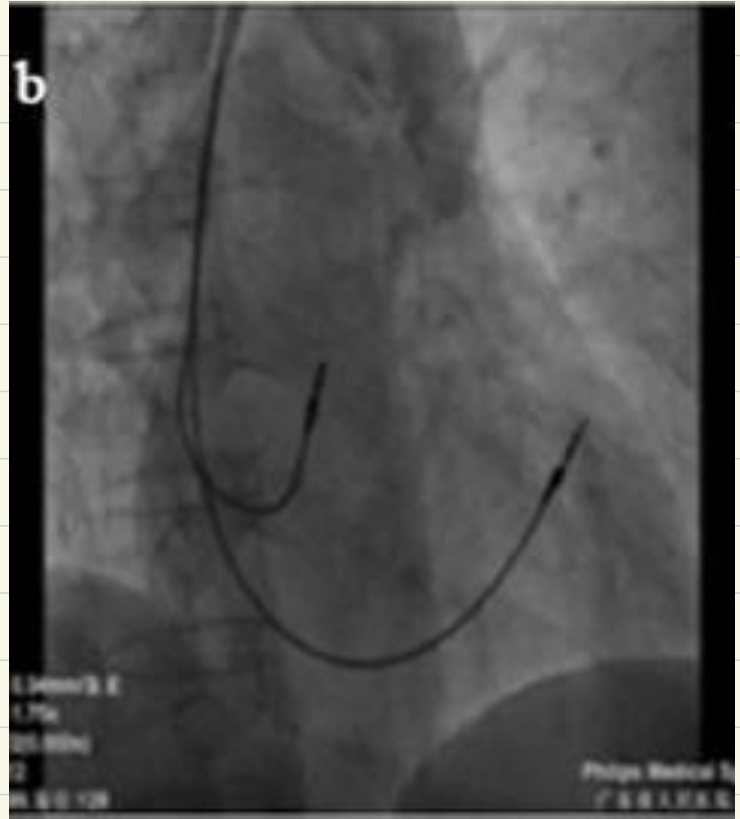


# Septum Positions

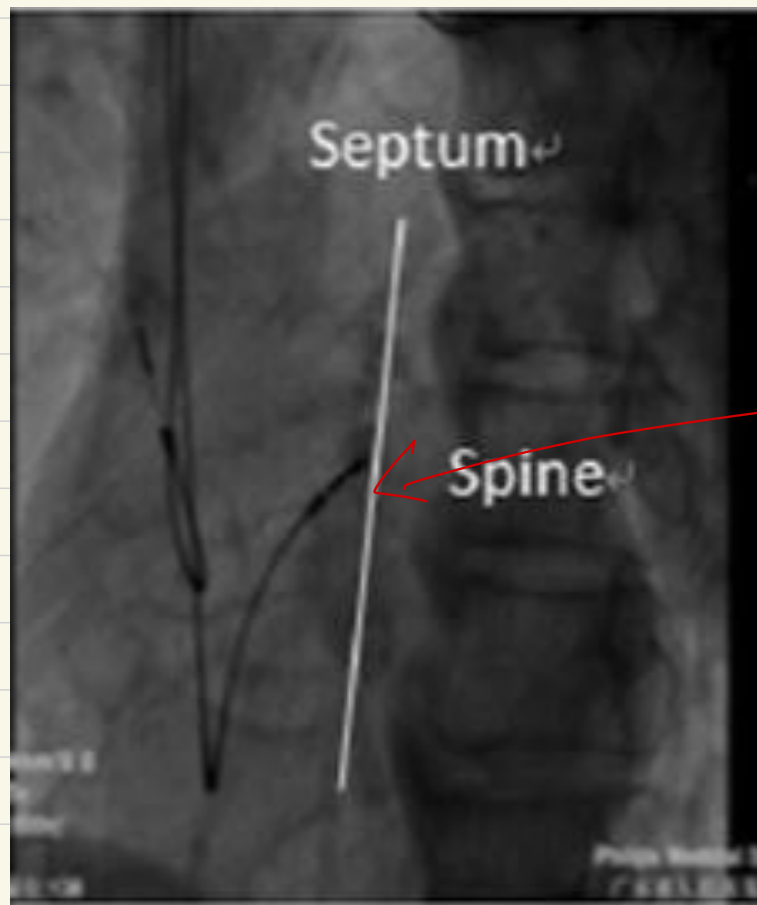
AP



RAP

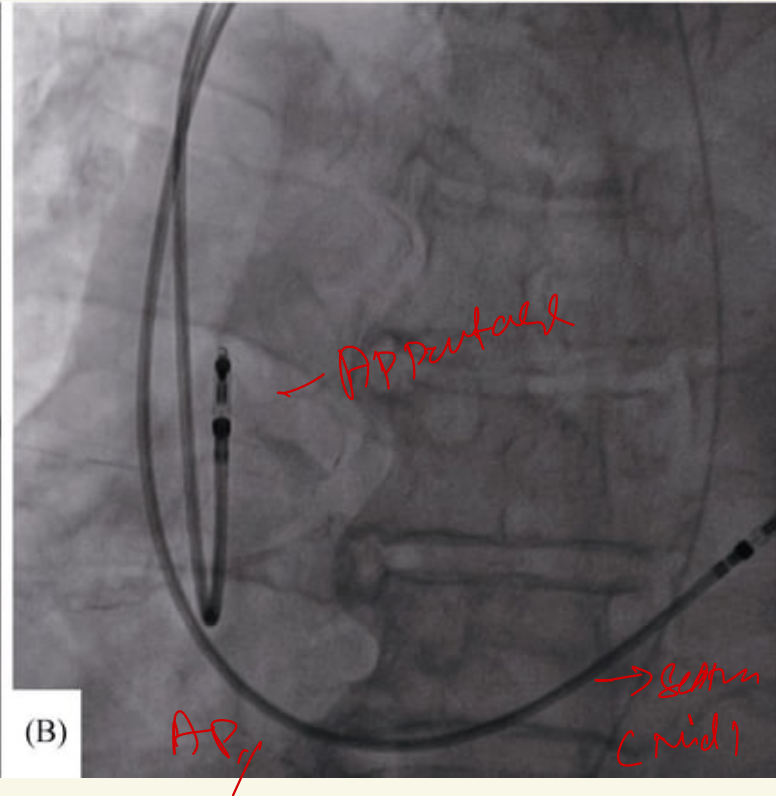
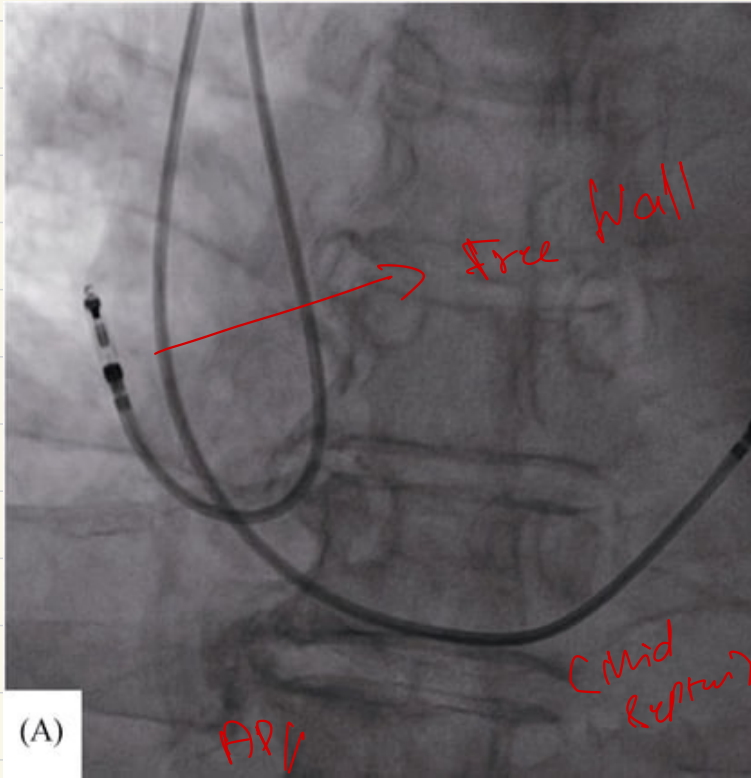


LAD

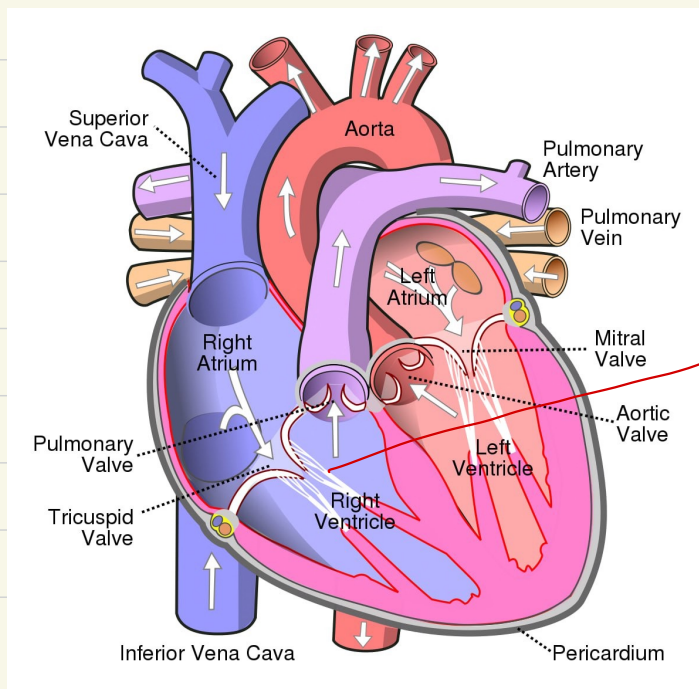


# Mistake of Implant the Pacemaker

## 1. Free wall Position

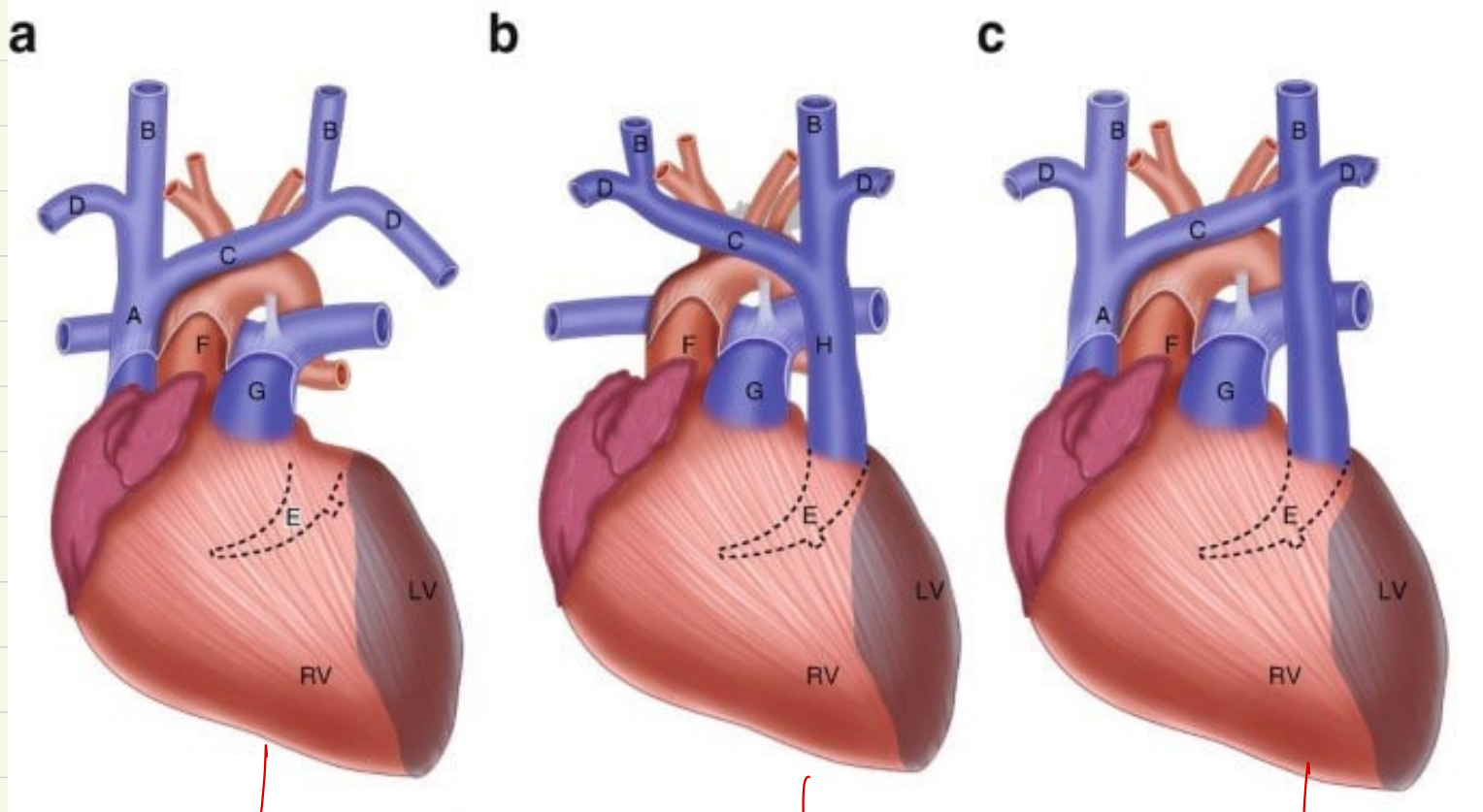


## 2. Caddy Through Lead



Through this or is called Caddy

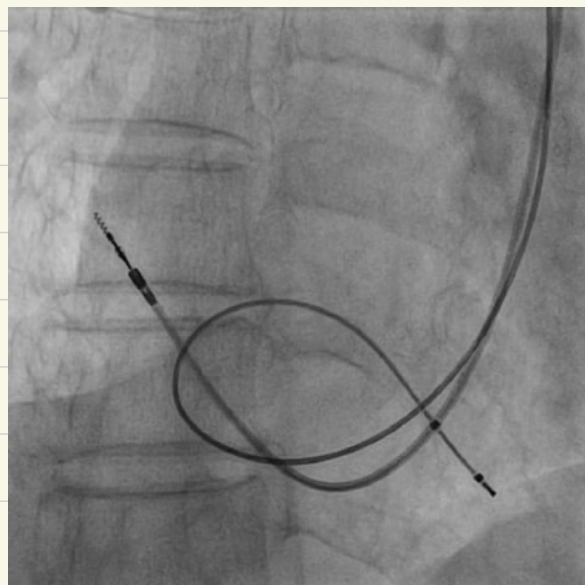
## 2. LSVC



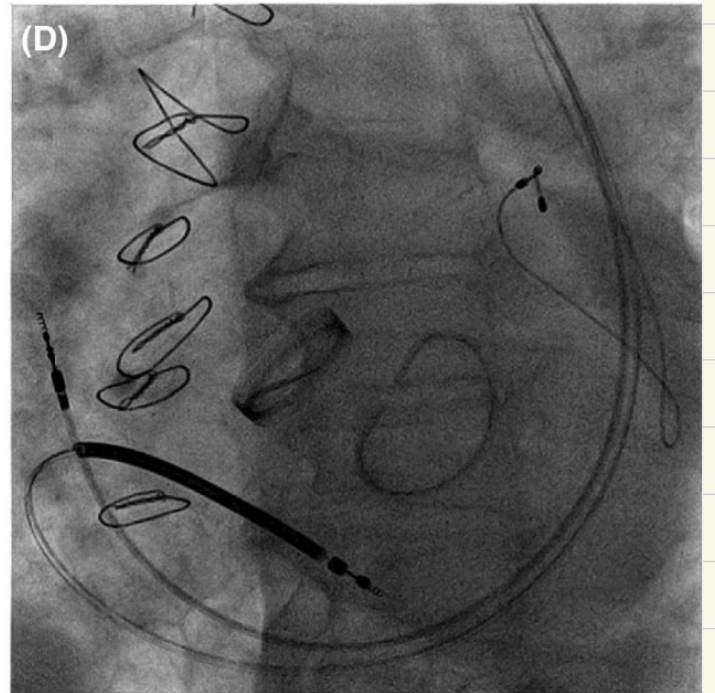
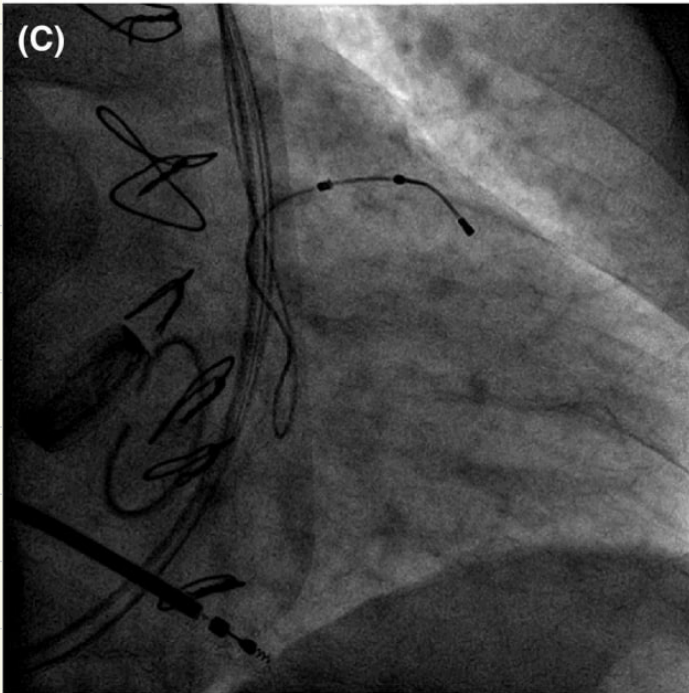
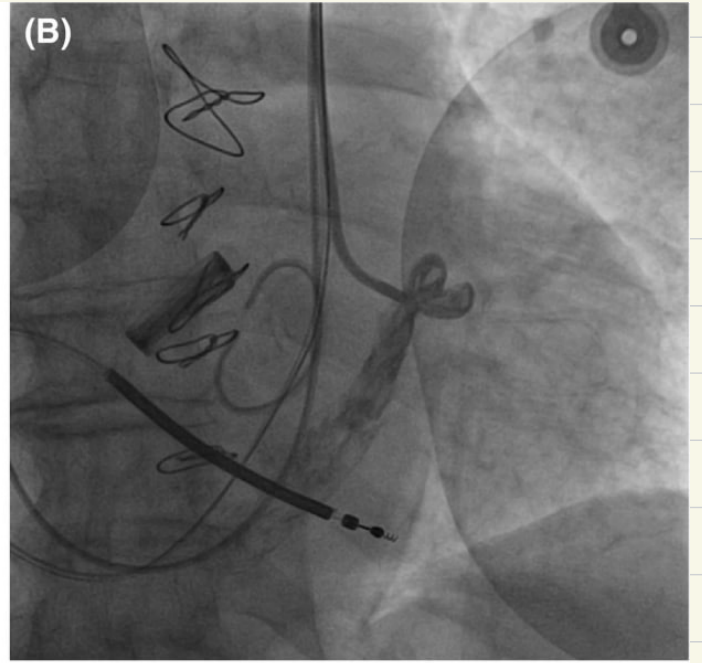
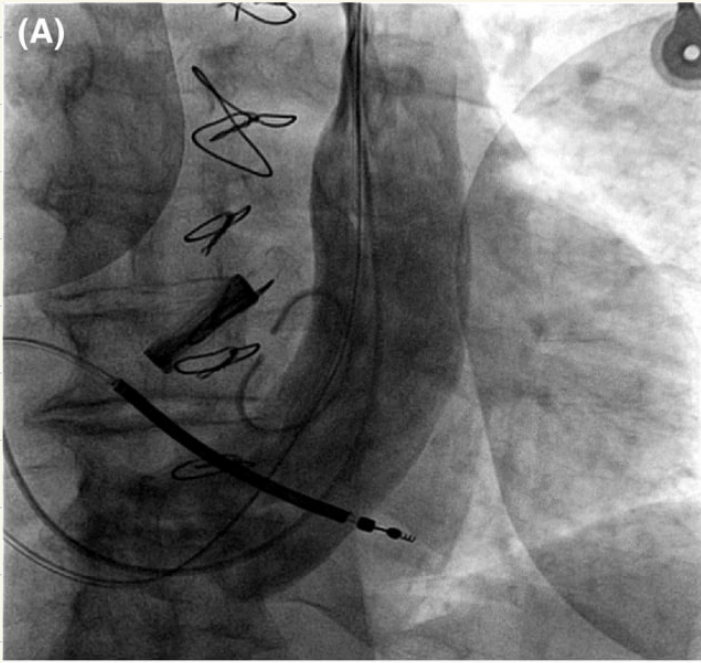
Normal  
SVC.

abnormal  
LSVC.  
only option  
to choose lower  
sheath.

LSVC common?  
usually do in  
right side  
palmars

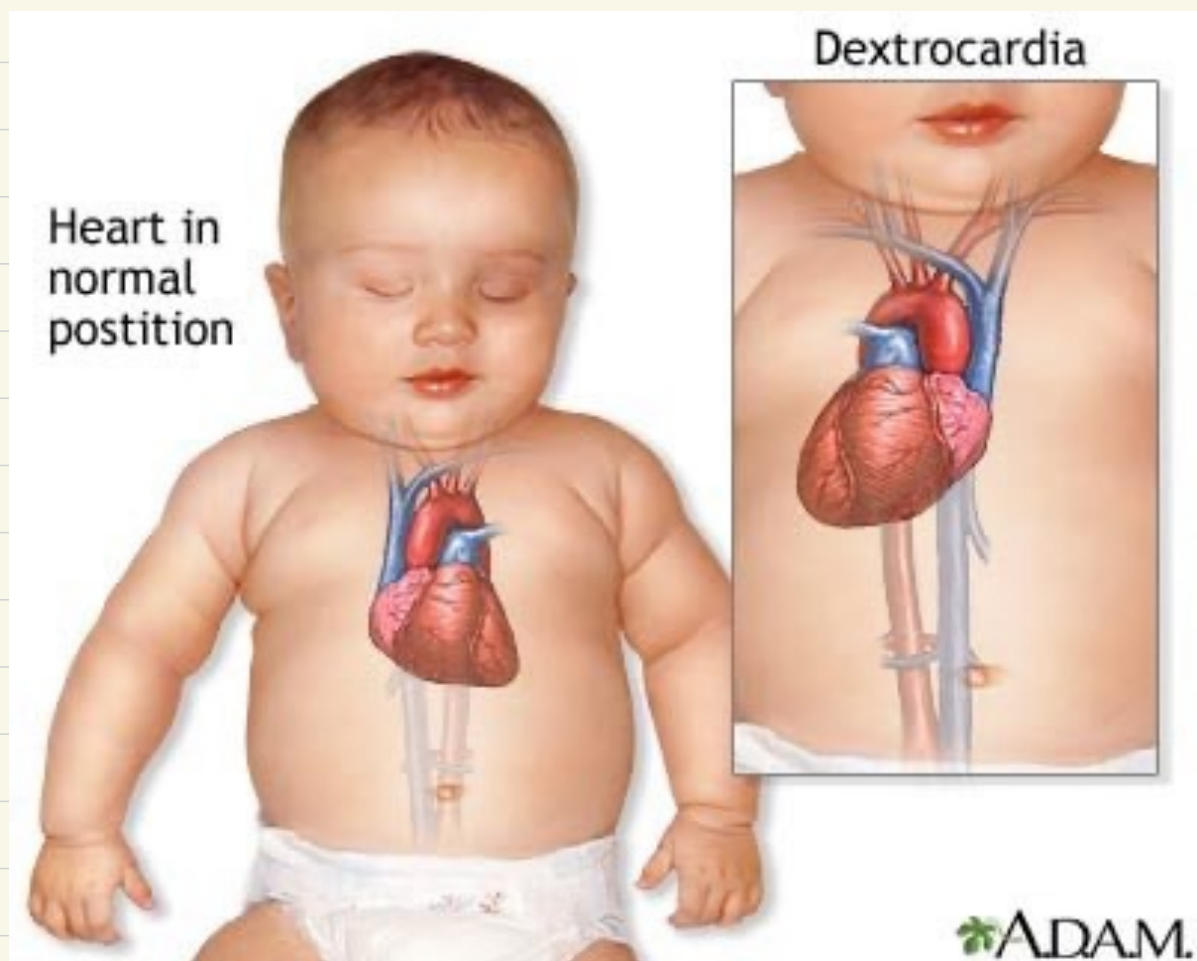




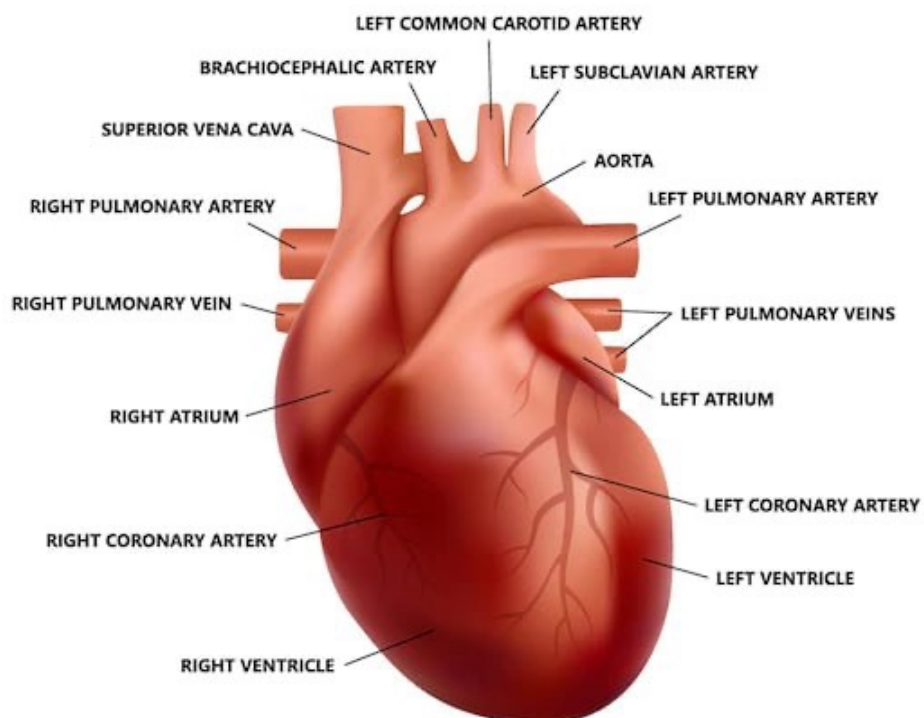




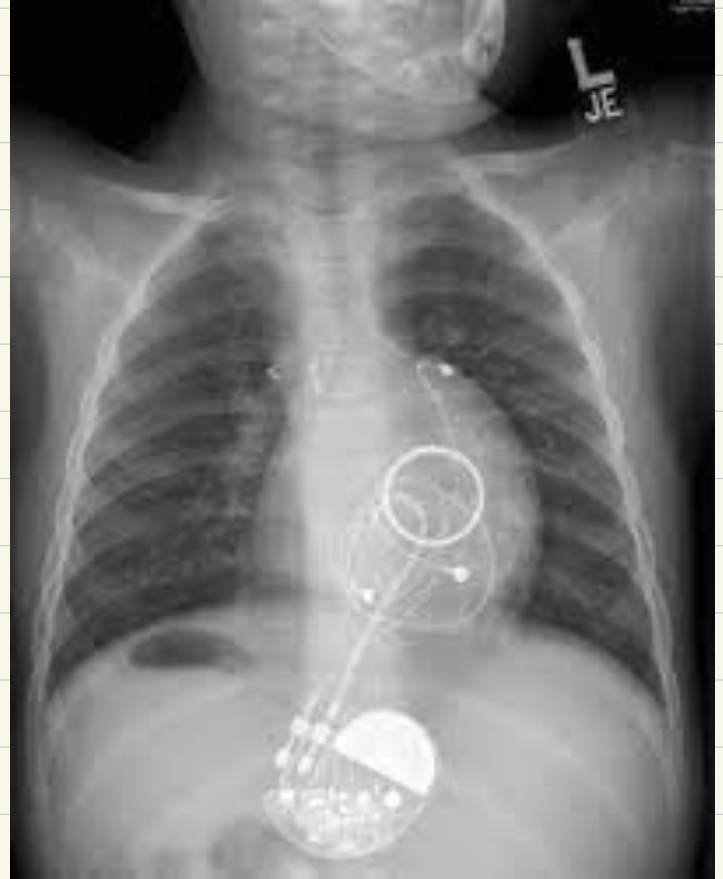
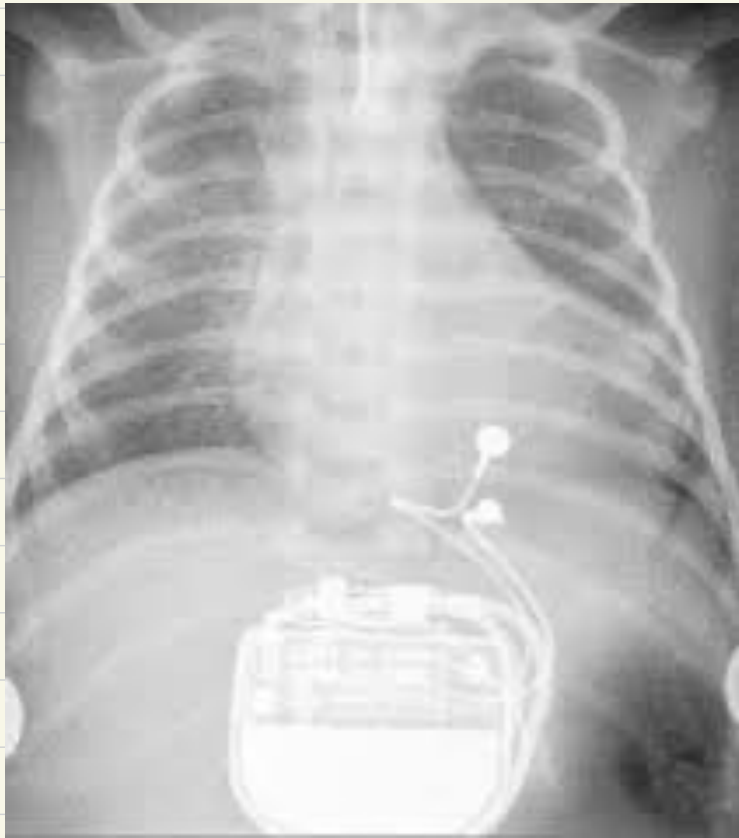
## 4. Dextrocardia



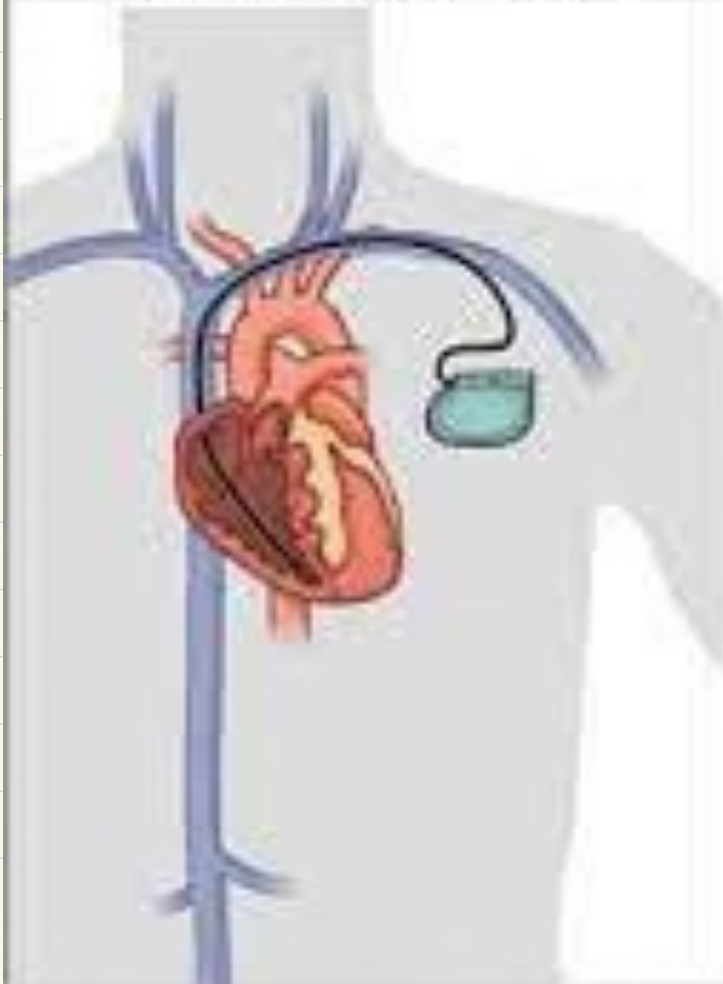
## 5. Vertical heart



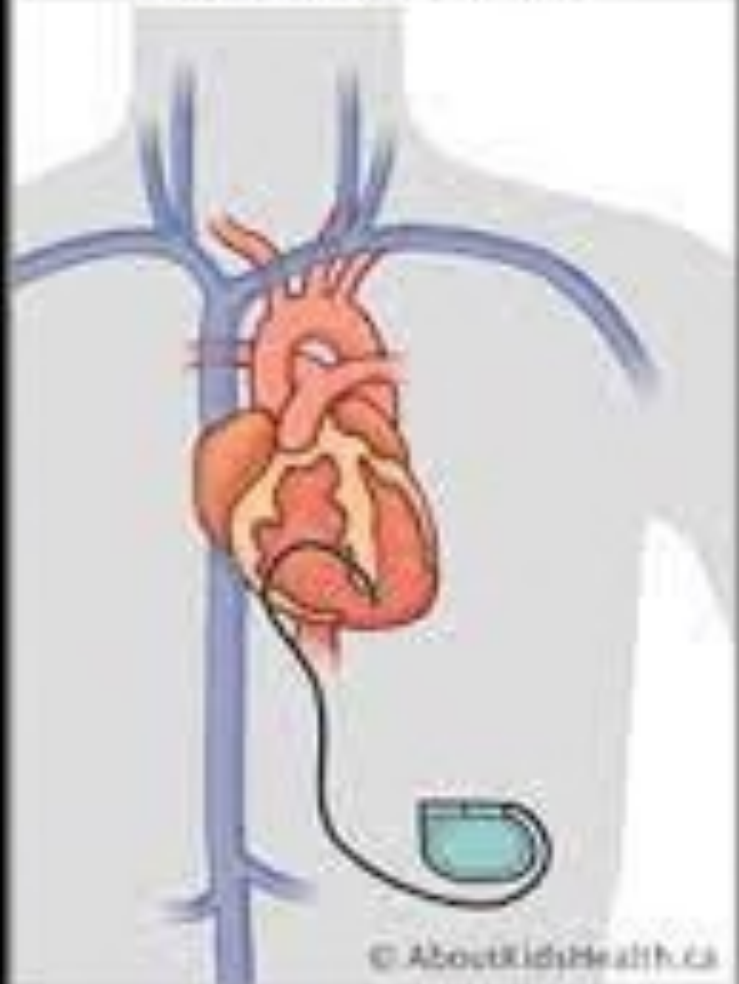
# Epicard Device Implant

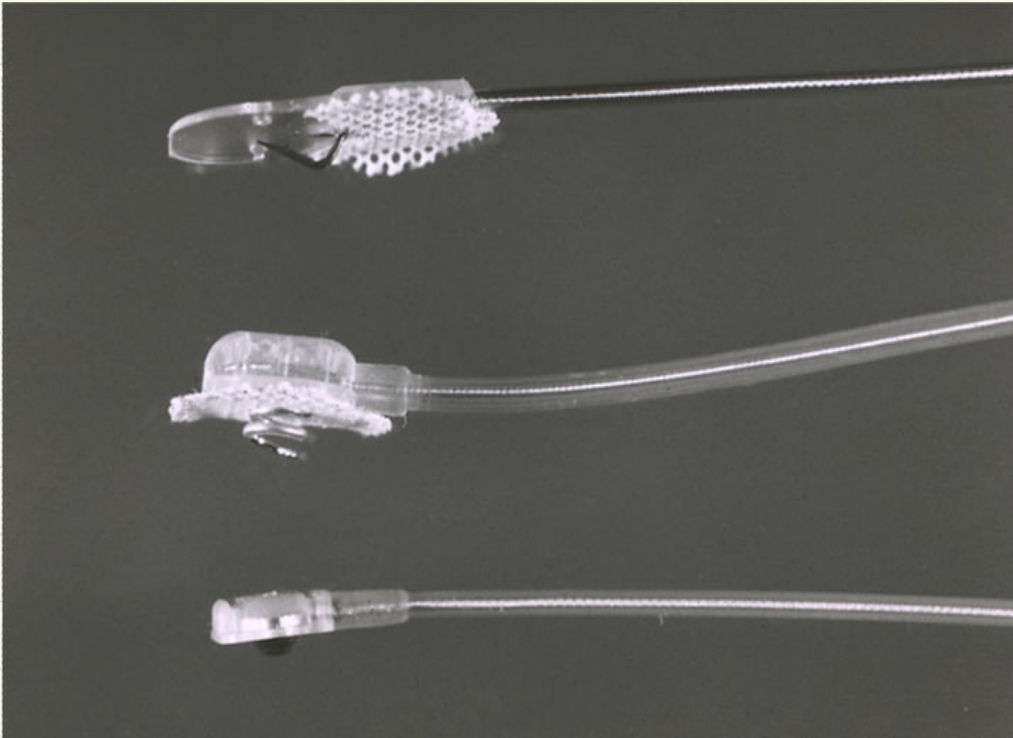


**Transvenous pacemaker**



**Epicardial pacemaker**

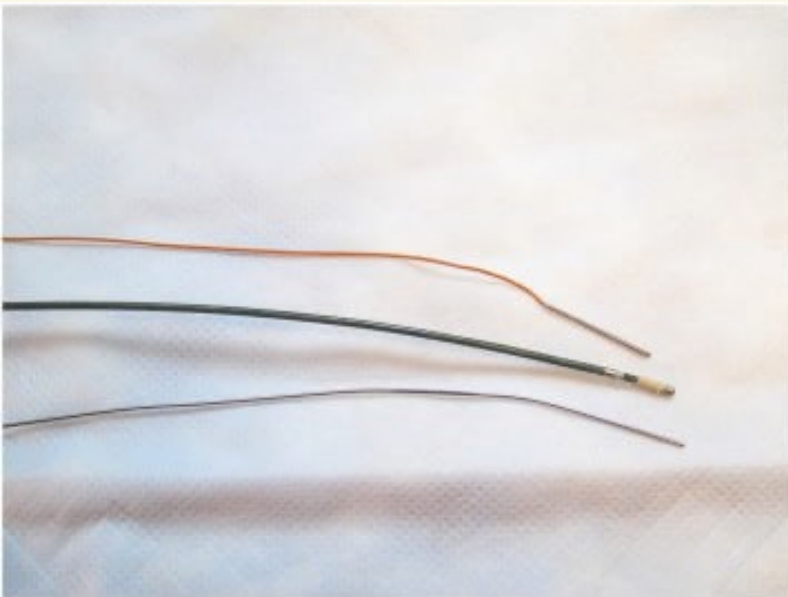




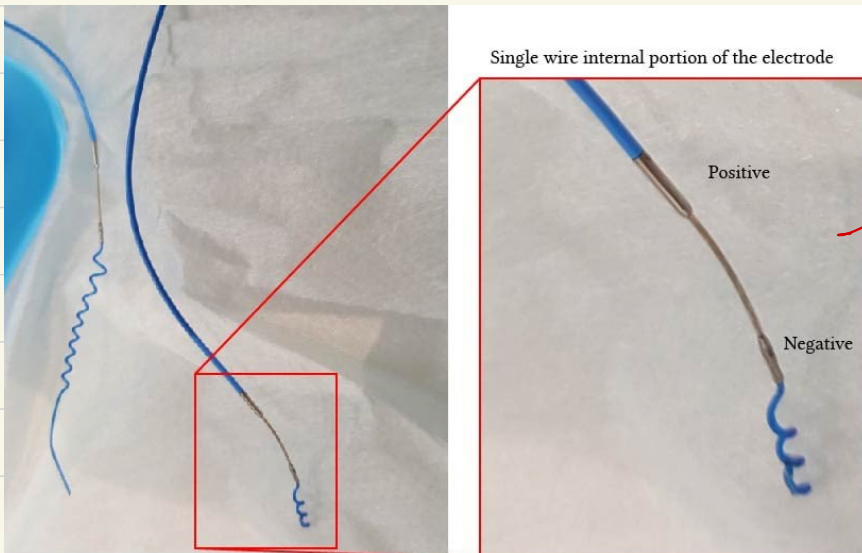
→ Menn lead

→ Button lead  
best

→ Screw in lead  
or  
high Thold



→ Temporary  
Epicardial  
Lead



→ just like  
a friction.