



Transcatheter closure of unroofed coronary sinus defect

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Unroofed coronary sinus defect

- A defect on the roof of coronary sinus, allowing communication between LA and RA
- Left-to-right shunt at atrial level
- association with persistent LSVC



Morphological types of unroofed coronary sinus

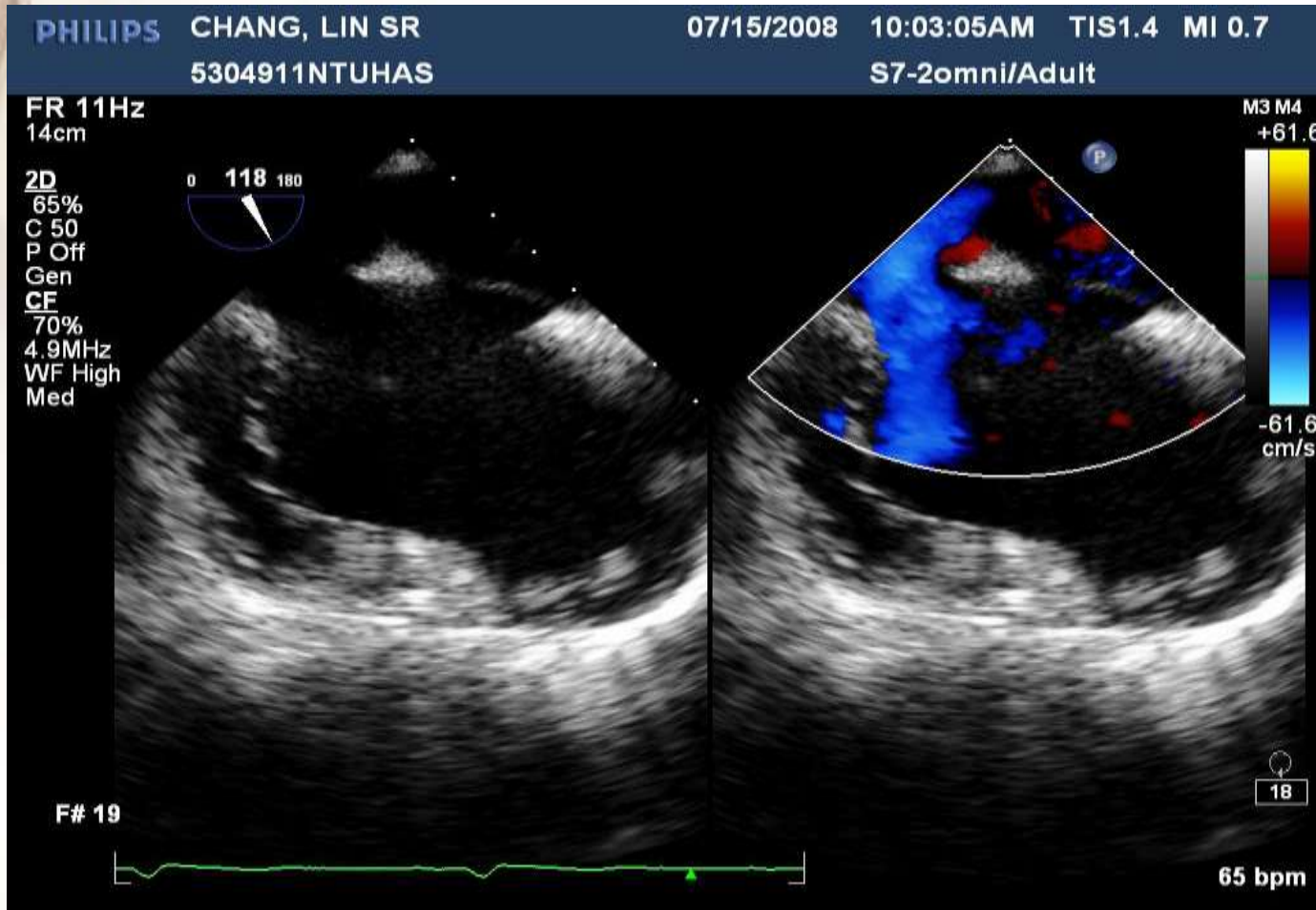
- Type I: completely unroofed CS with LSVC
- Type II: completely unroofed CS without LSVC
- Type III: partially unroofed mid-portion of CS
- Type IV: partially unroofed terminal portion of CS

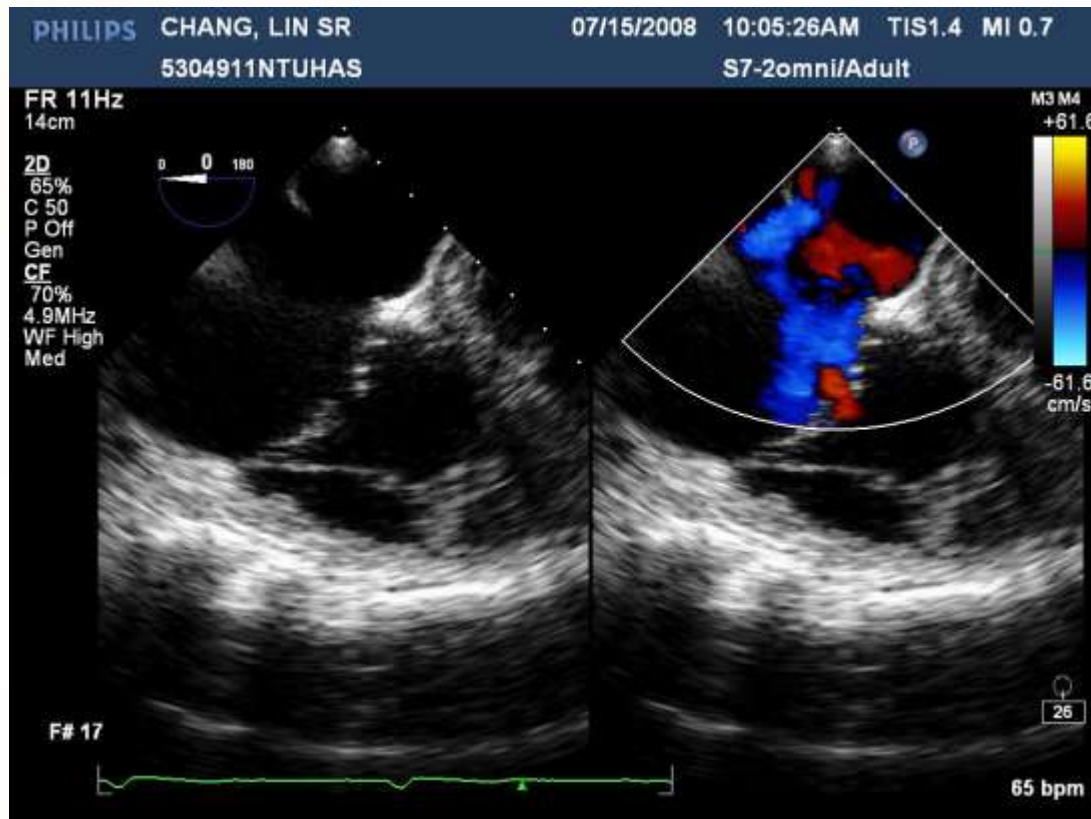


Difficulties encountered in CS management

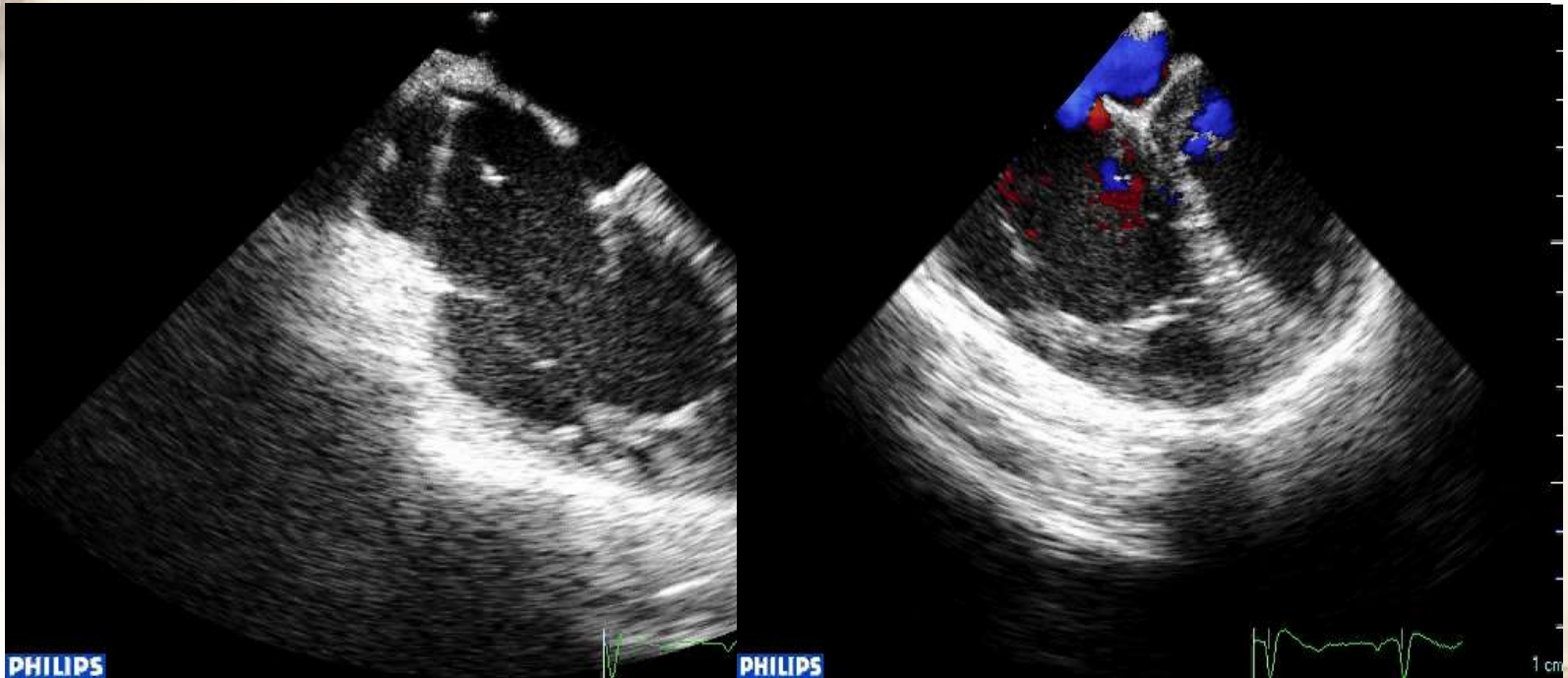
- precardial echo frequently inadequate to make the diagnosis
- transcatheter closure: very rare reports technical aspects not well described

TEE images of unroofed CS





Complete form unroofed CS defect





Deploy the device at CS ostium vs in the defect

- which is better?
theoretically close the defect is better
- presence of PLSVC
→ deploy at the defect
- But, “terminal portion defect” without PLSVC, no rim toward CS ostium
>> close the CS ostium



Procedures of transcatheter closure of unroofed CS (I)

- hemodynamics & angiograms
- G/A & TEE images
- pass a right Judkins to LA or LUPV
→ ASD G/W



Procedures of transcatheter closure of unroofed CS (II)

- Balloon sizing?
- Select a device within 2 mm larger
- deploy the device at CS ostium or defect
- TEE/ angio check position

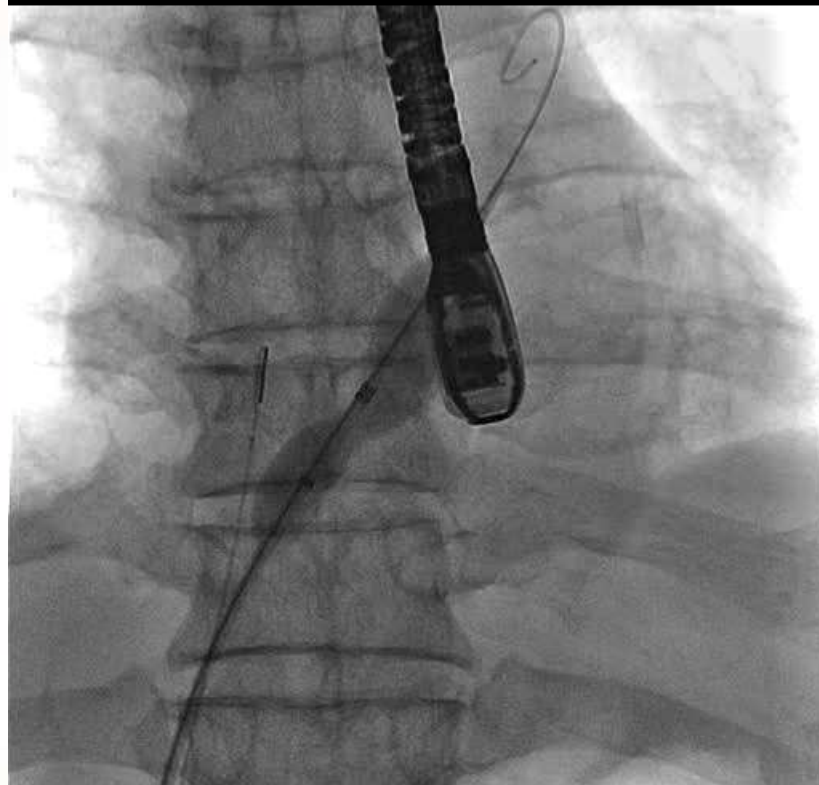


TEE monitoring of CS defect or ostium closure

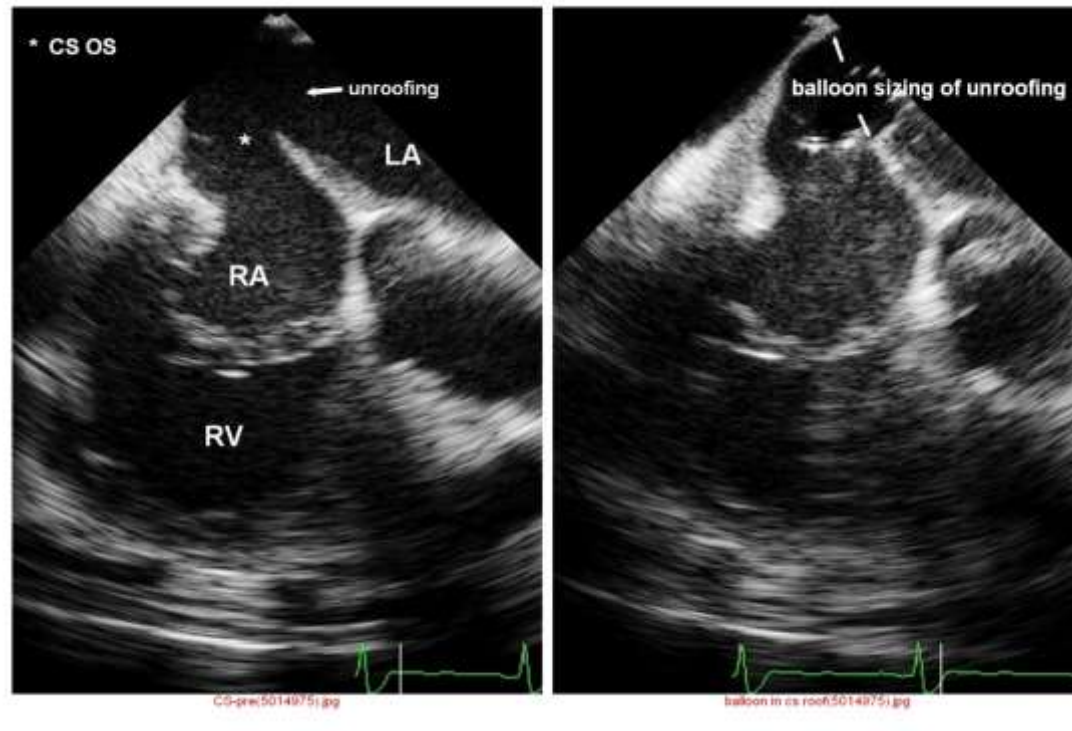
- TEE provides better images of CS defect than TTE
- The device position can be well delineated with TEE
- CS blood flow return can be traced

Balloon sizing

Lossy compression - not intended for diagnosis



Balloon sizing





Our experiences (I)

- 9 patients (5 M, 4F) age 26-69 years, median 39 years
- Qp/Qs 2.4 ± 1
- mean PASP 35 ± 19 (21-77)mmHg
- One complete form, others partial form
- balloon sizing n= 8, no sizing n= 1

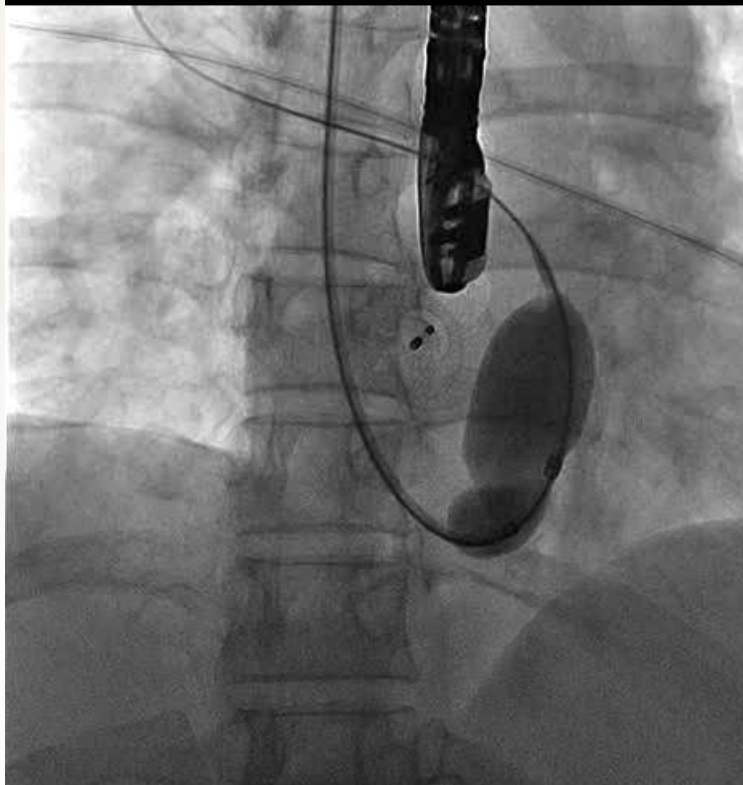


Our experiences (II)

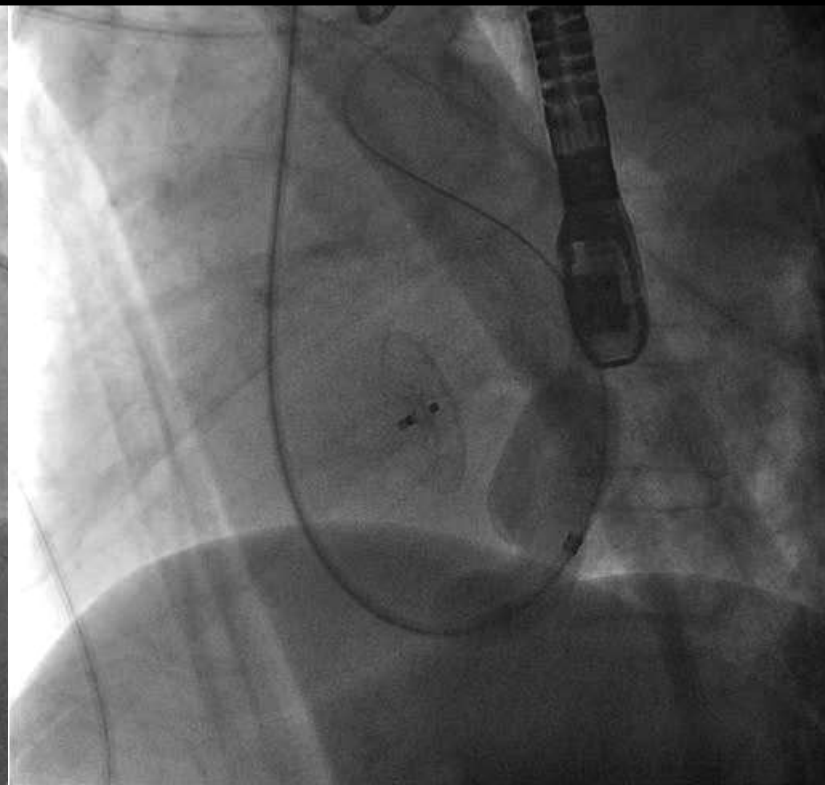
- Deploy at CS ostium in 8, at defect in 1
- Device size (ASO) 21 ± 3.6 mm (16-28 mm)
- 4 required 1-2 size larger device because of failures

Balloon sizing mid-portion CS defect

Lossy compression - not intended for diagnosis

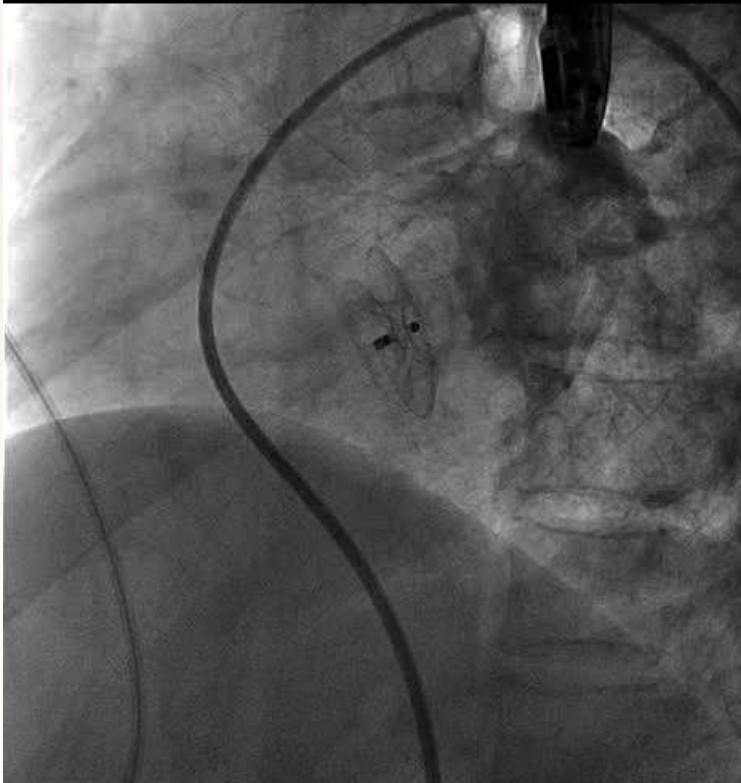


Lossy compression - not intended for diagnosis

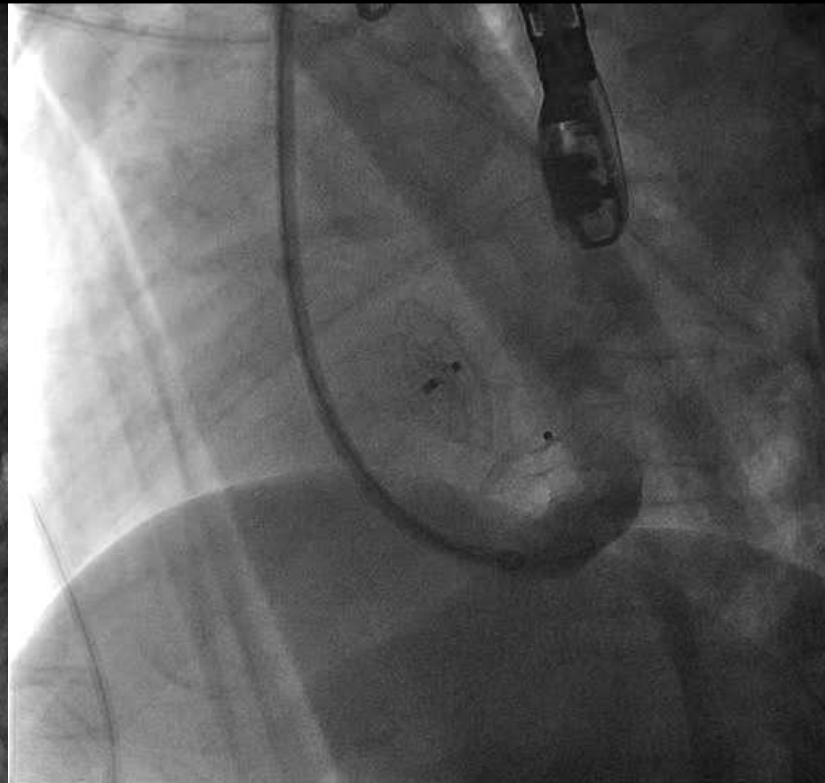


Mid-portion CS defect

Lossy compression - not intended for diagnosis

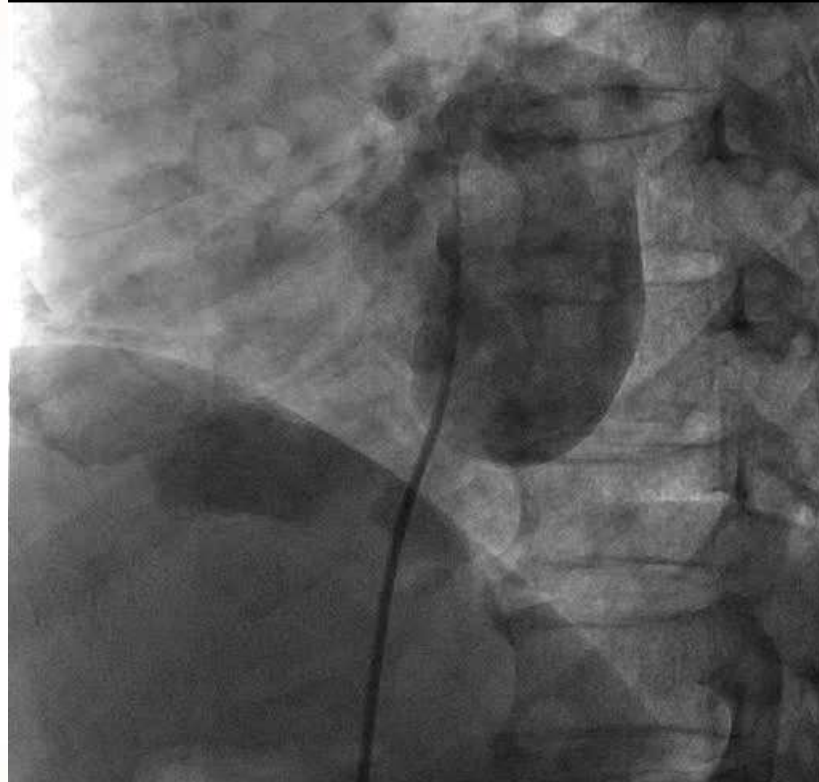


Lossy compression - not intended for diagnosis



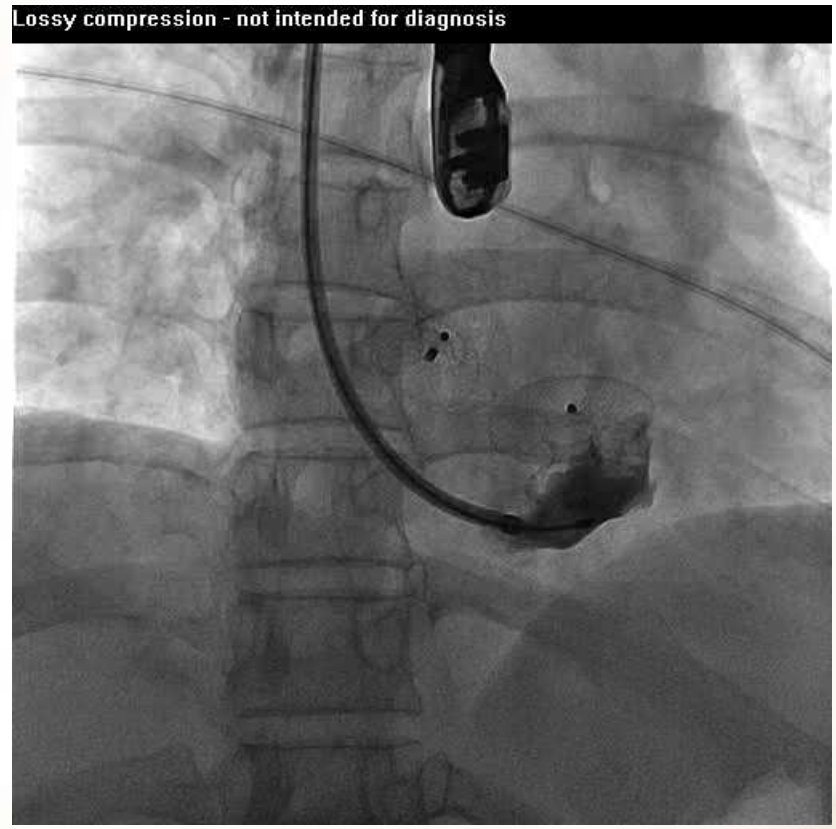
Mid-portion unroofed CS

Lossy compression - not intended for diagnosis

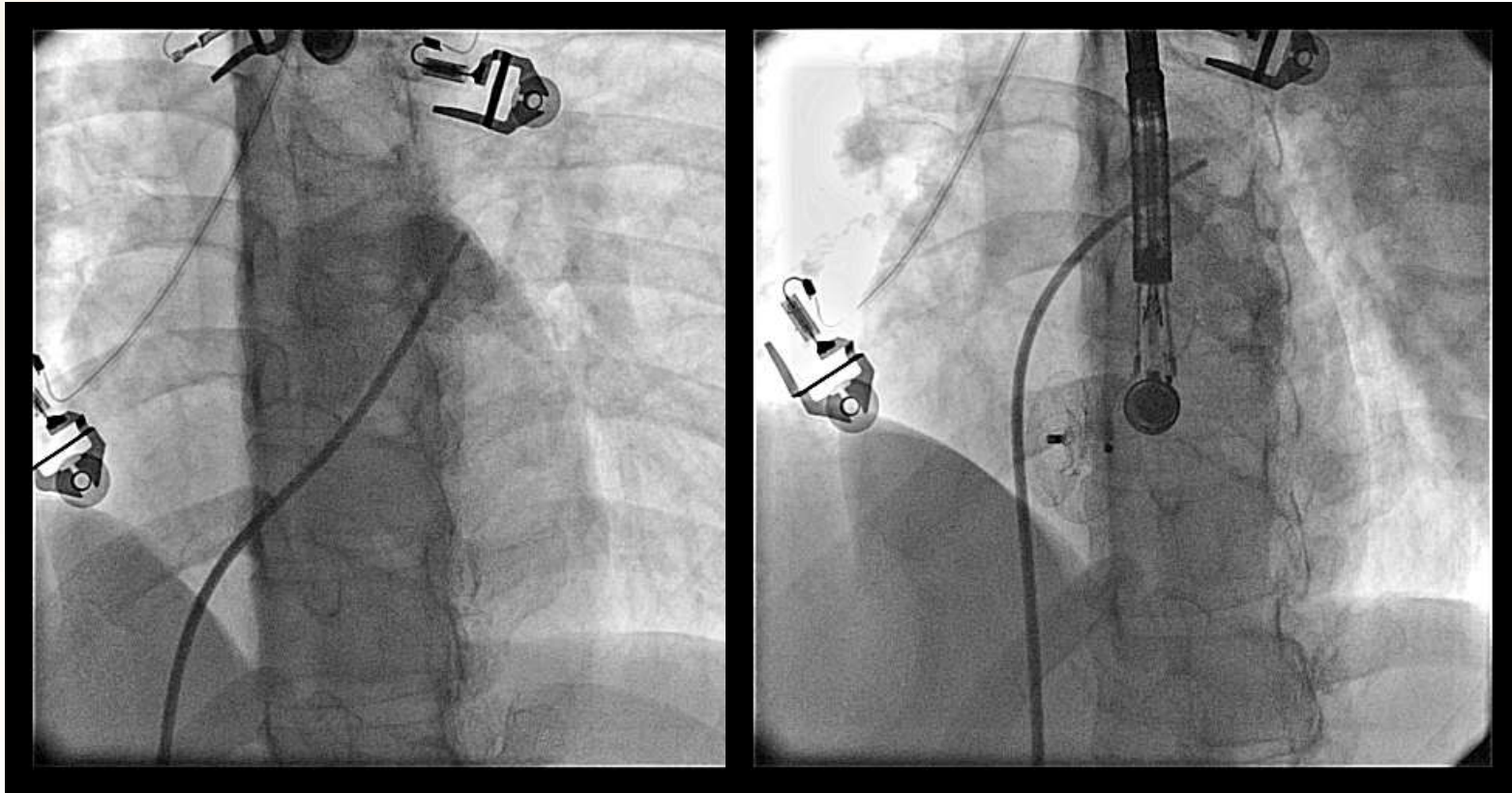




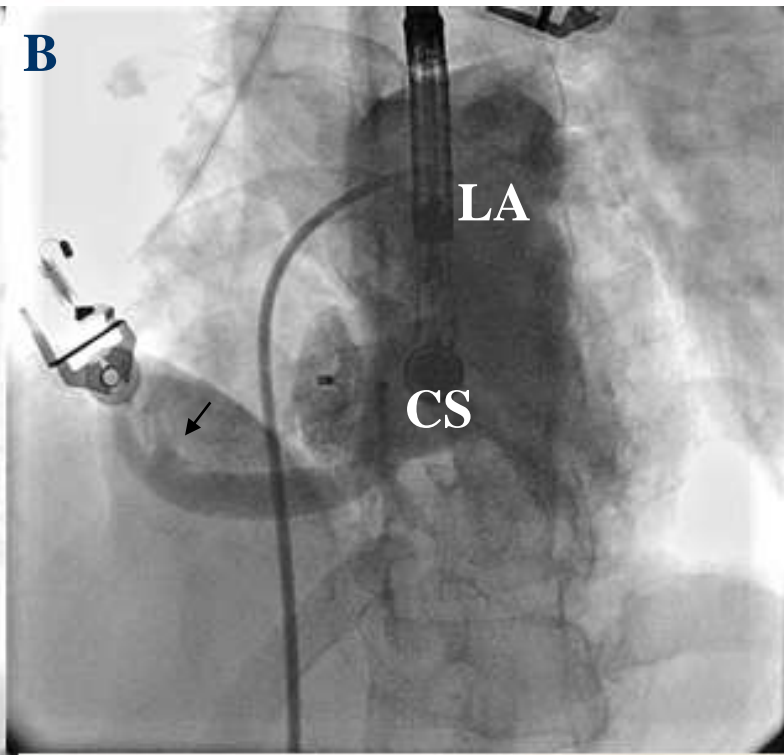
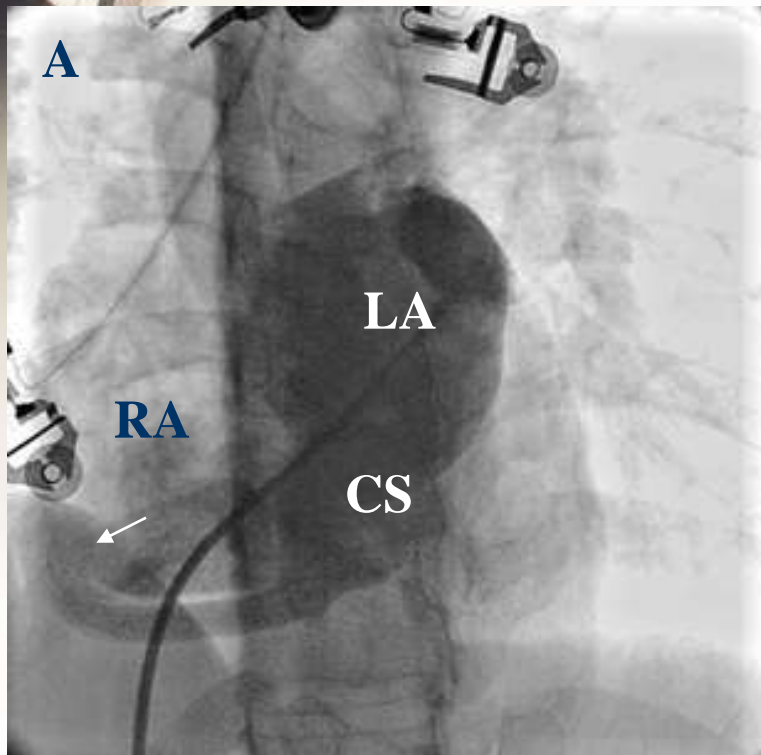
Mid-portion CS defect closure check venous return of coronary veins



Terminal portion CS defect

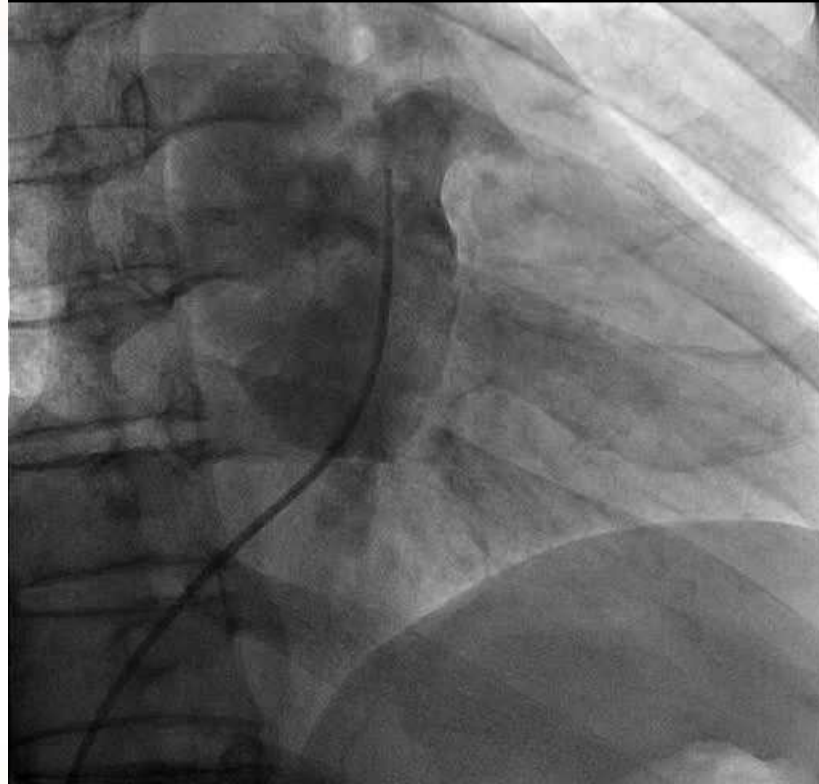


Unroofed CS s/p CS ostium closure



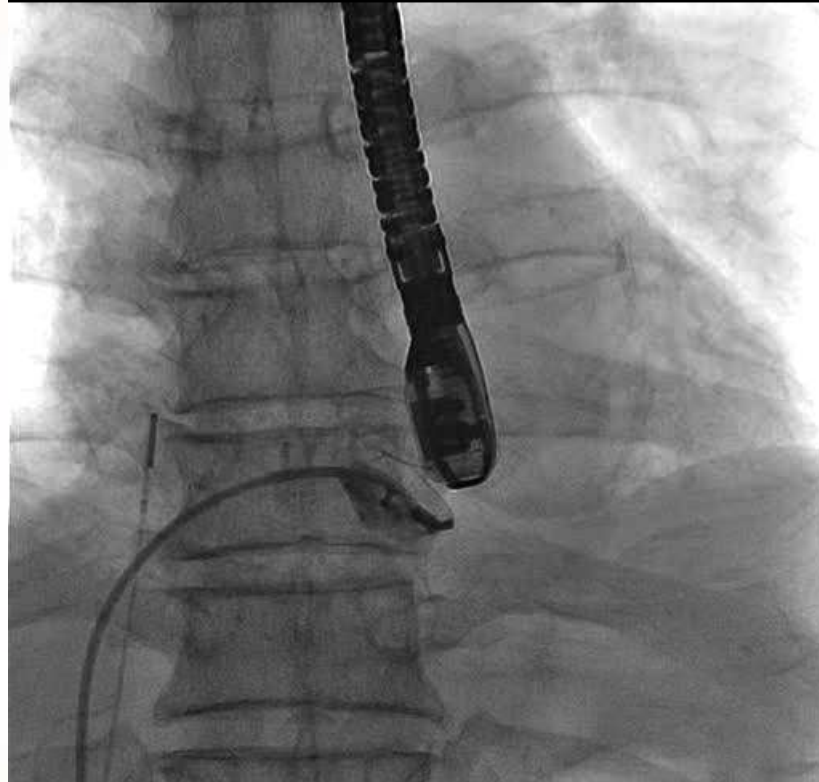
proximal-portion CS defect

Lossy compression - not intended for diagnosis



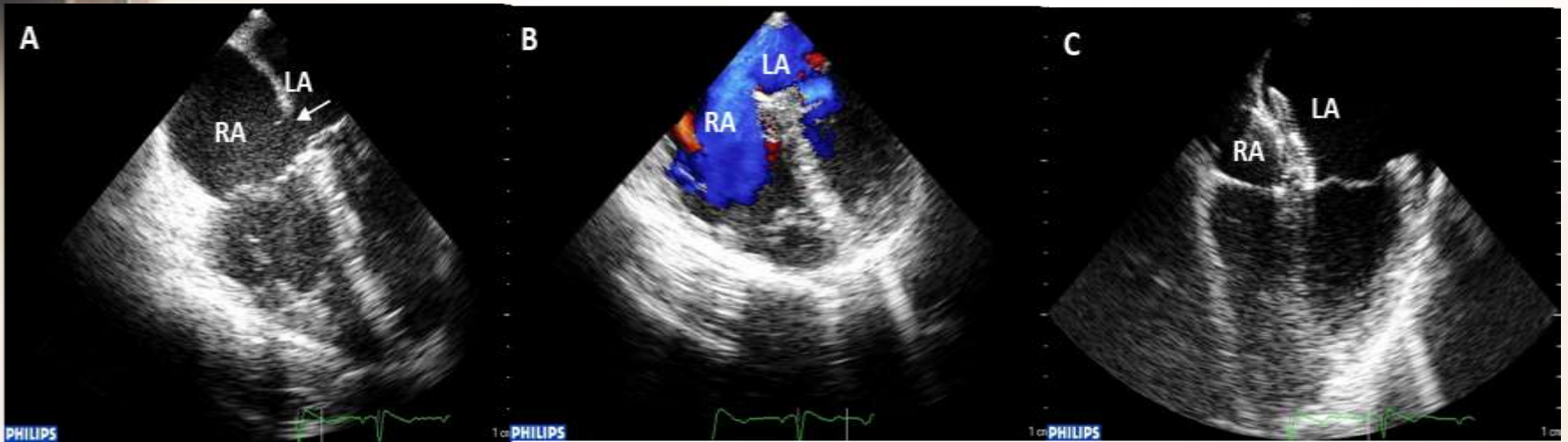
Unroofed CS defect s/p closure

Lossy compression - not intended for diagnosis

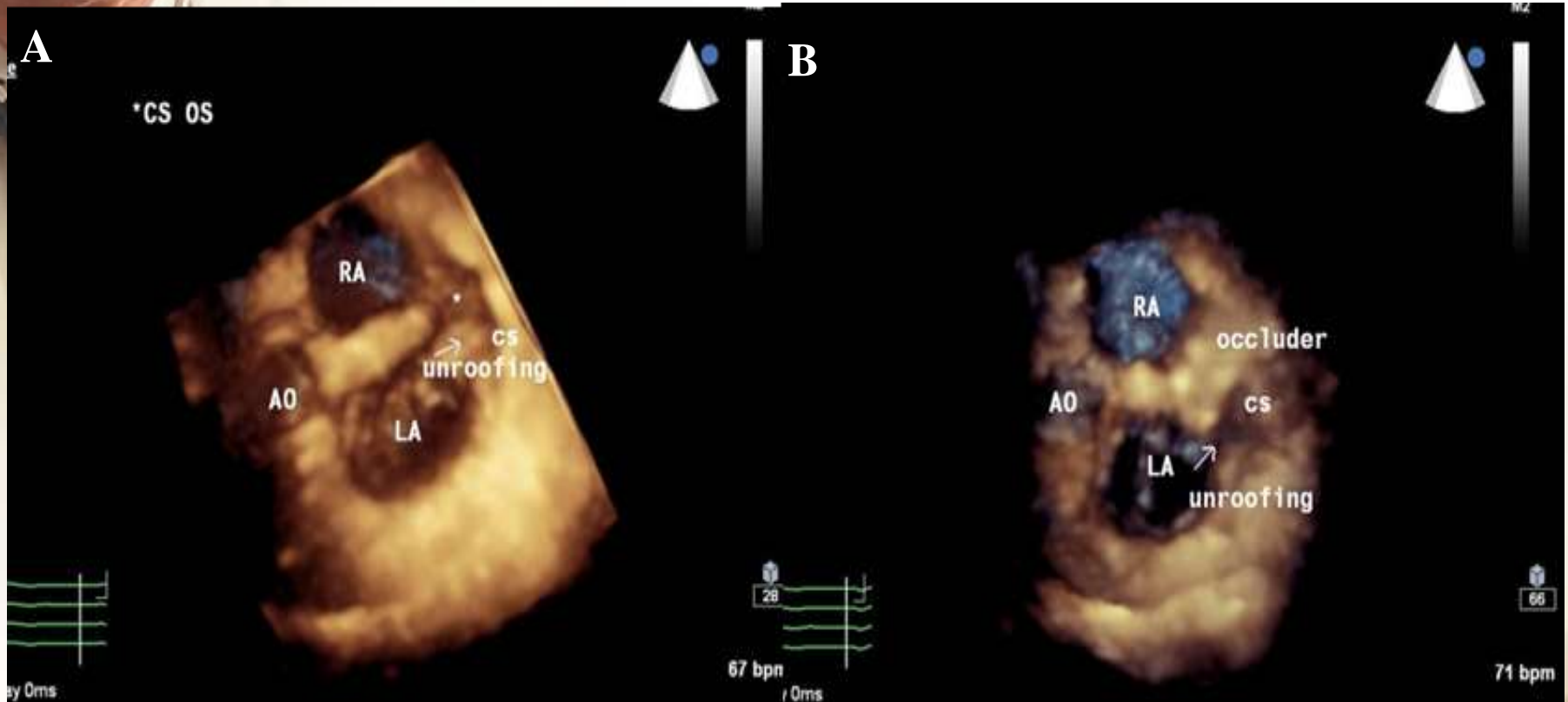




Complete form CS defect closure




3-D images of CS defect closure

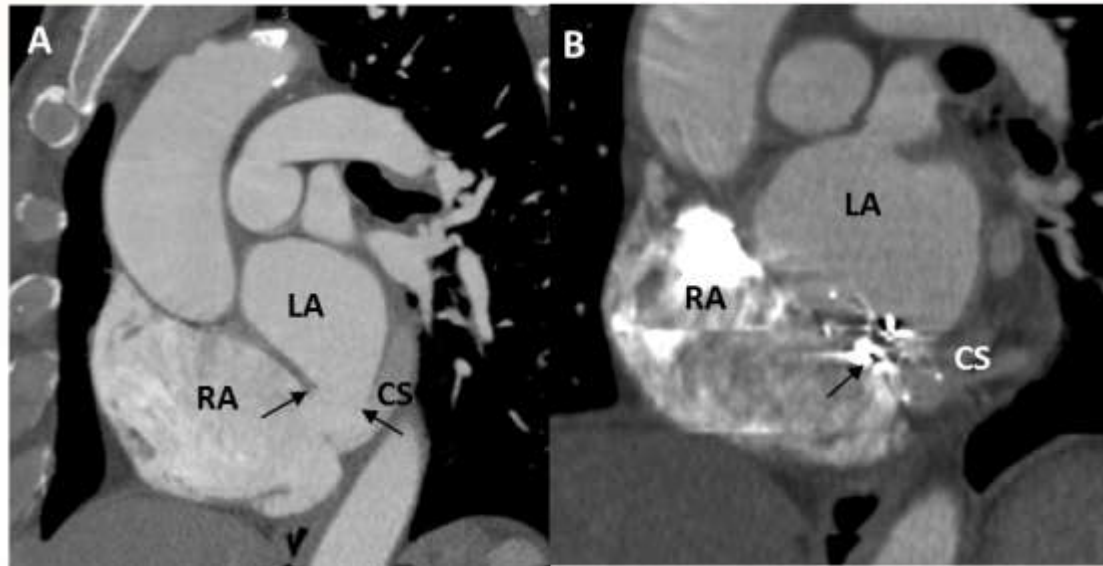


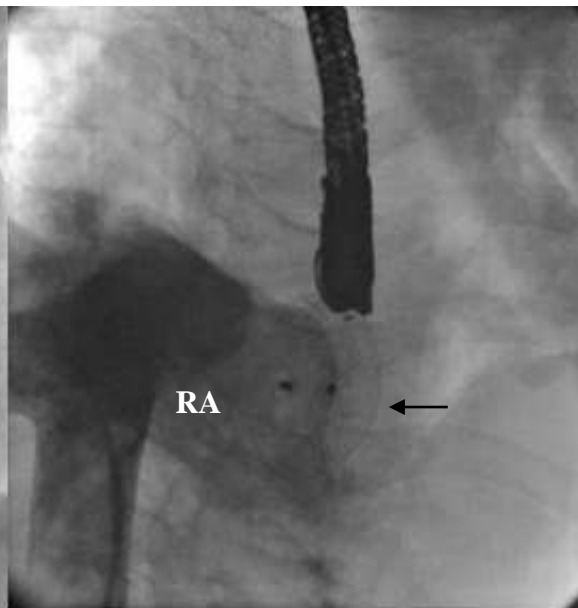
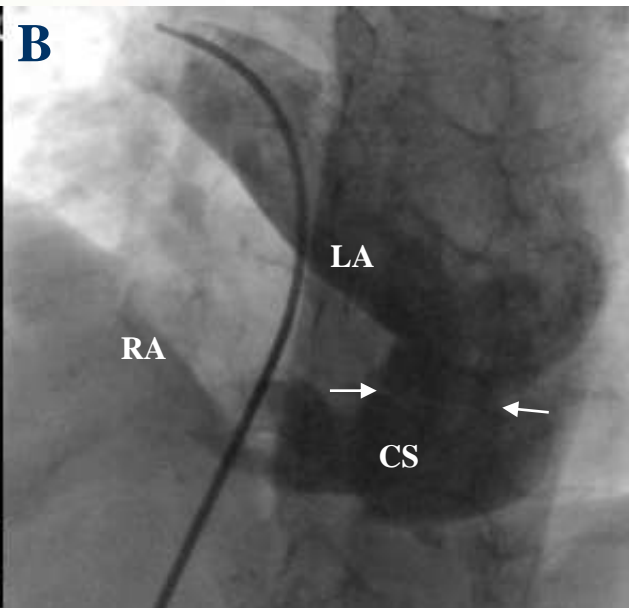
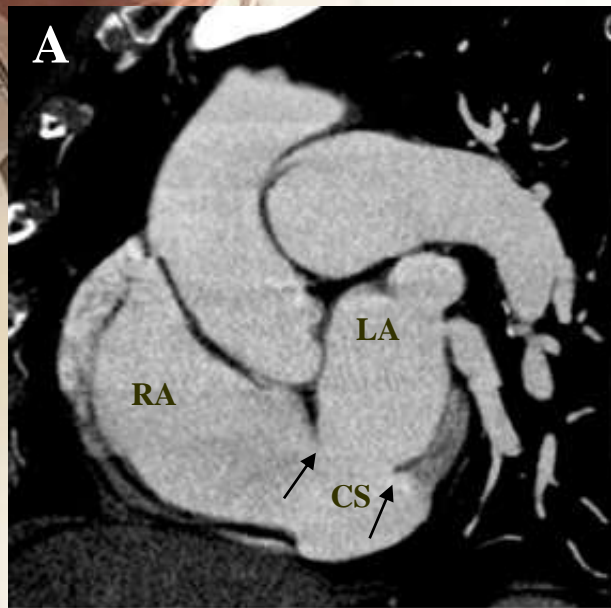


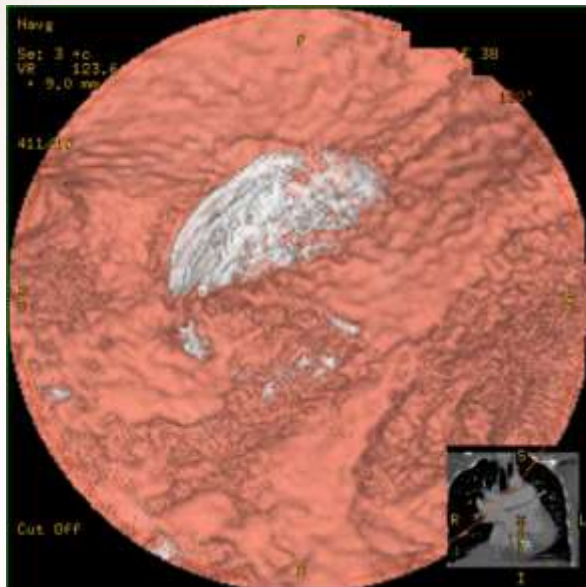
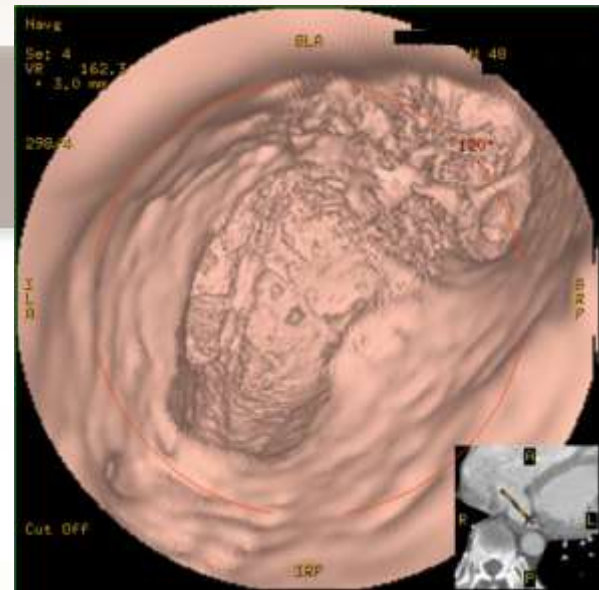
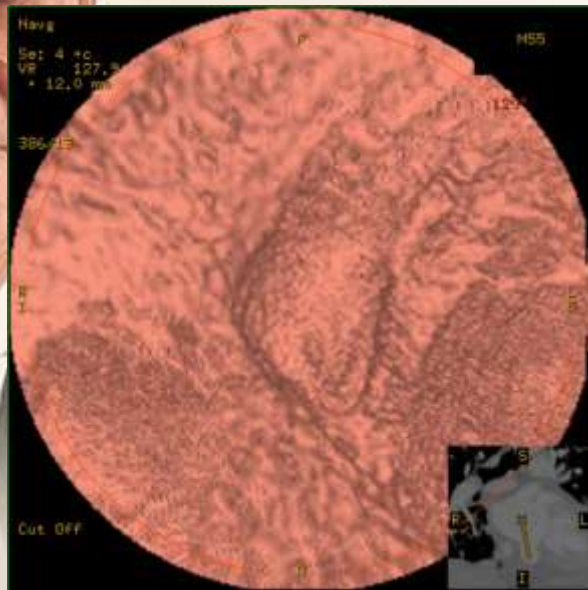
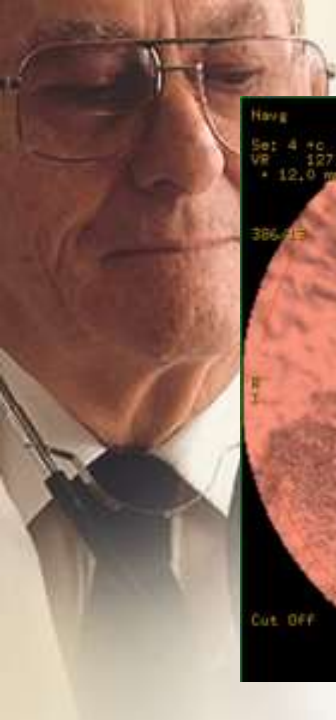
CT (MRI) images

- as a tool for planning the procedure
 - F/u the position of the device
 - to detect the presence of CS flow obstruction
- 

CT image CS closure

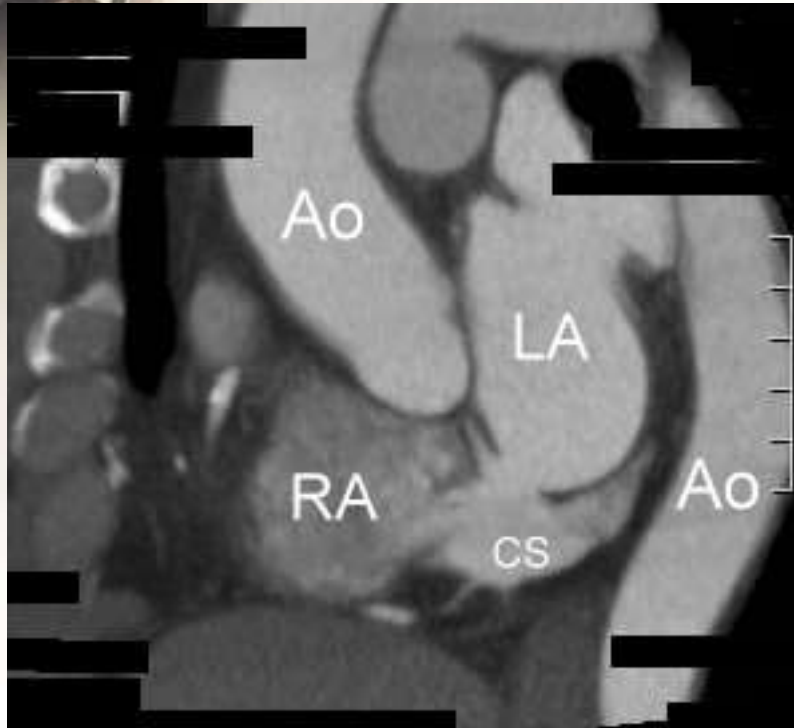




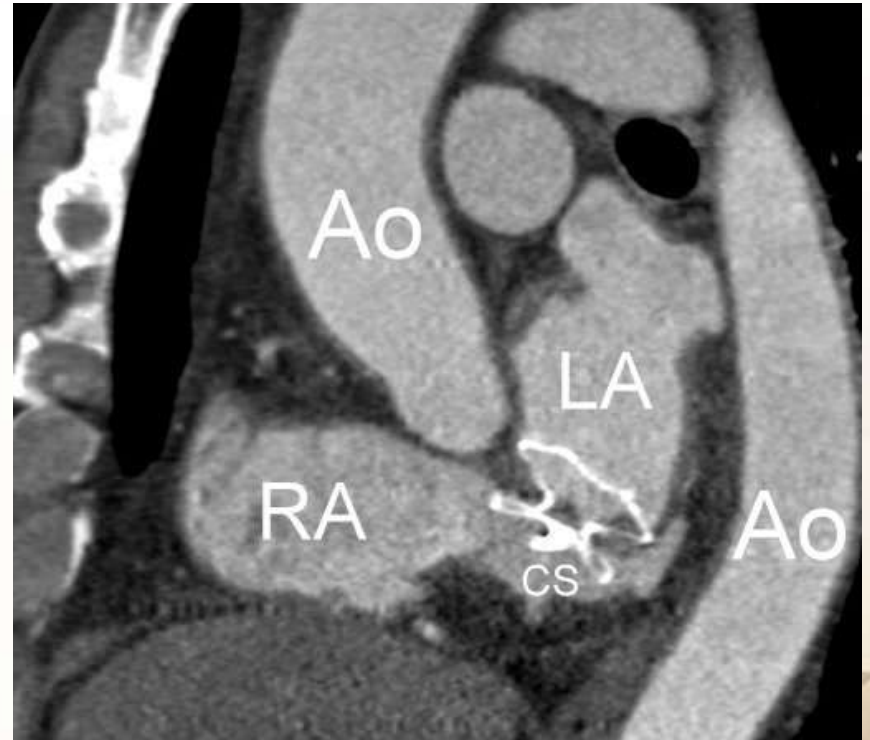


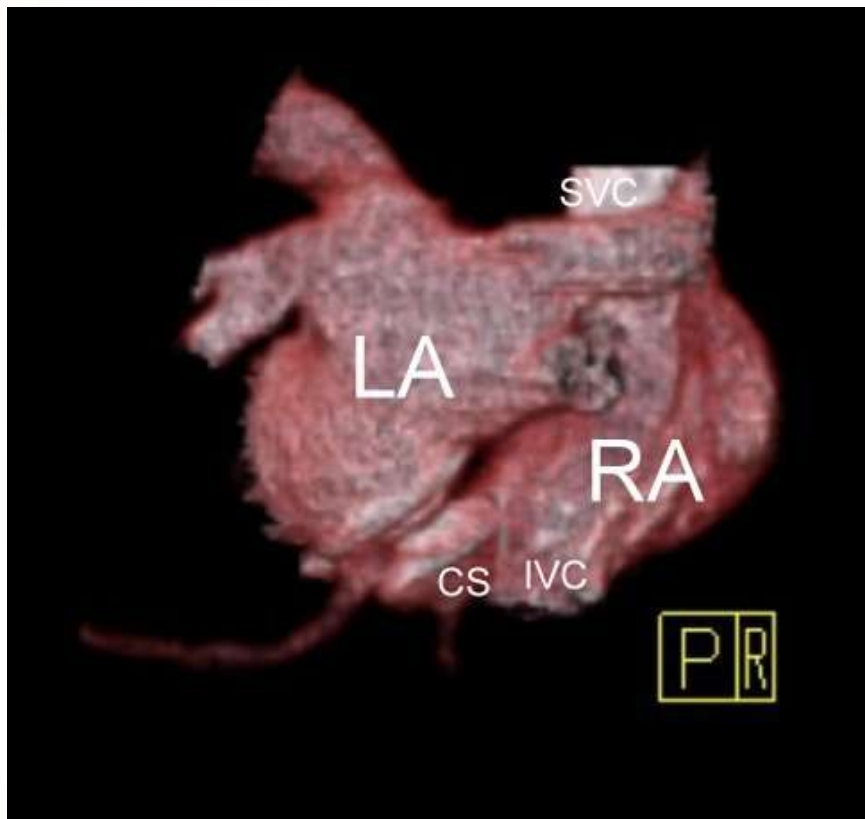
Unroofed CS defect s/p closure

pre



post



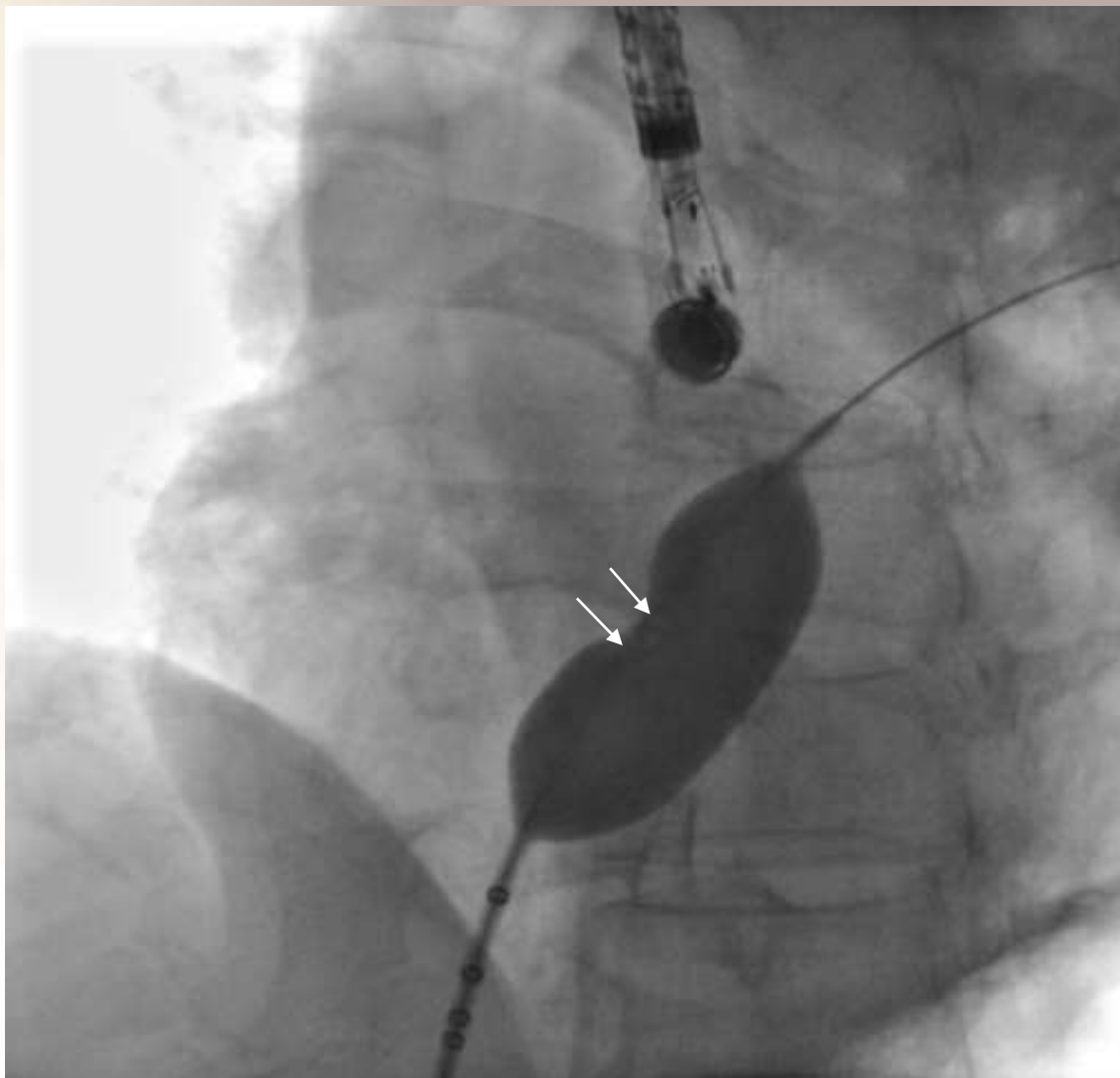


PR



Balloon sizing for CS defect

- Two waists can be observed sometimes
→ defect & ostium of CS
- In 4 patients, a larger size device was required. This can be explained by the fact that the CS ostium instead of the defect was closed.





Device deployment

- In the defect ?
- At the coronary sinus ostium ?



Disadvantages of closing CS ostium

- redirecting CS blood flow to LA
- obstruction in CS blood flow return
- conduction system
- contradicted when PLSVC is present



Conclusions

- Most unroofed CS defect can be managed with transcatheter technique
- close the defect or CS?