Left Atrial Appendage Occlusion Device

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Atrial fibrillation ?

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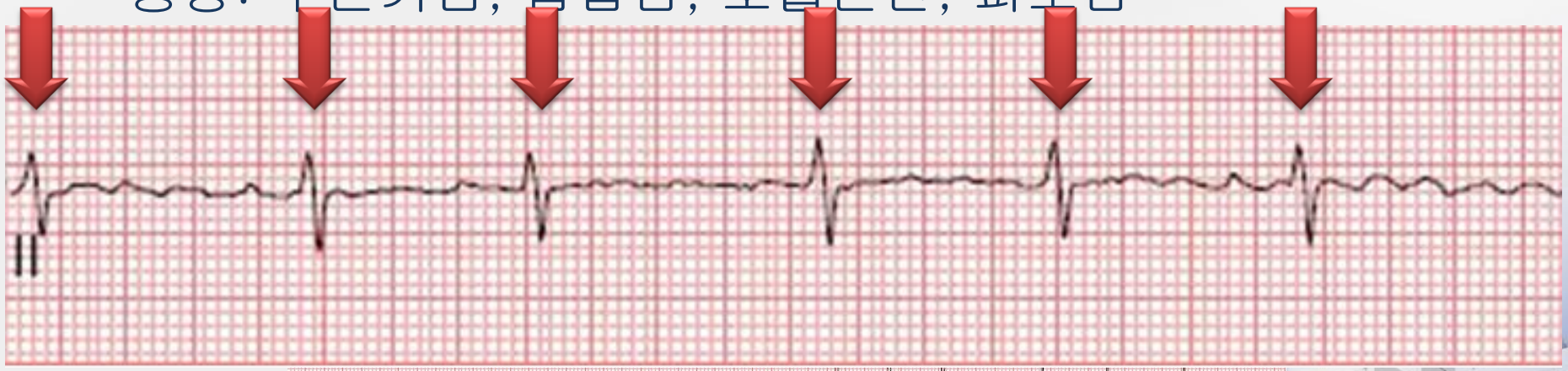
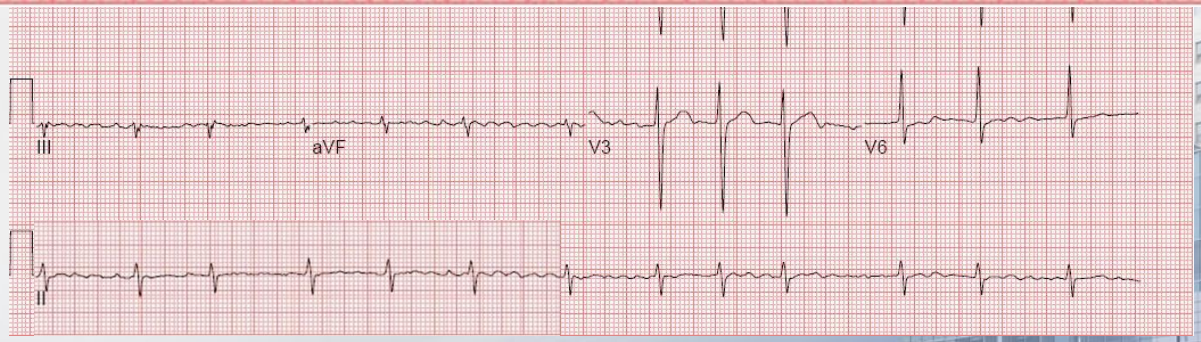
Atrial Fibrillation

- 심방의 박동이 여러 부위에서 동시 다발적으로 빠르게 발생하는 질병
- 증상: 두근거림, 답답함, 호흡곤란, 피로감





Atrial Fibrillation의 치료

Paroxysmal
Persistent
) AF ablation 가능

Chronic **?**

- Rate control - Pharmacological Agent (β-blocker)
- Rhythm Control - AAD, Cardioversion
- Anti-coagulation - Coumadin, Warfarin

5

Chronic AF

- **AF increases the risk of stroke**
- **Coumadin, Warfarin**

: Stroke의 위험 감소

출혈과 같은 **Side Effect** 위험 증가

⟹ **LAA occlusion device**

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Left Atrial Appendage

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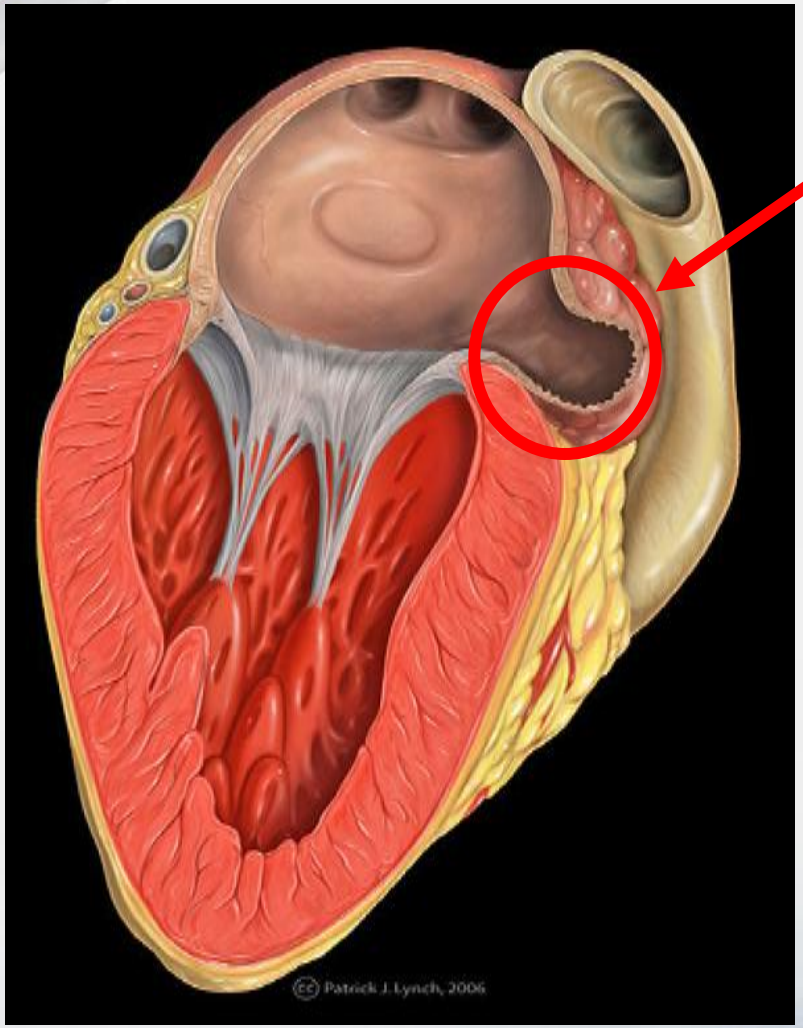
LAA anatomy



Left atrial appendage (LAA)

- **LA의 Muscular pouch 로써,**
- **Major source of blood clots**

- ***More than 90% of stroke in AF caused by blood clots that form in the left atrial appendage (LAA)[1]***

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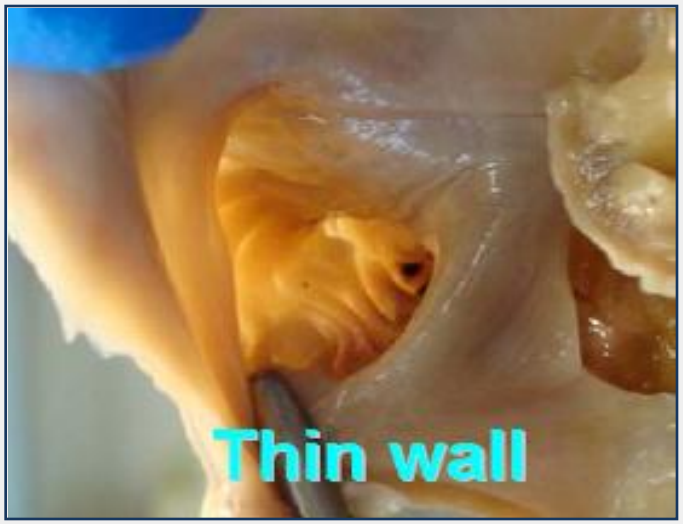
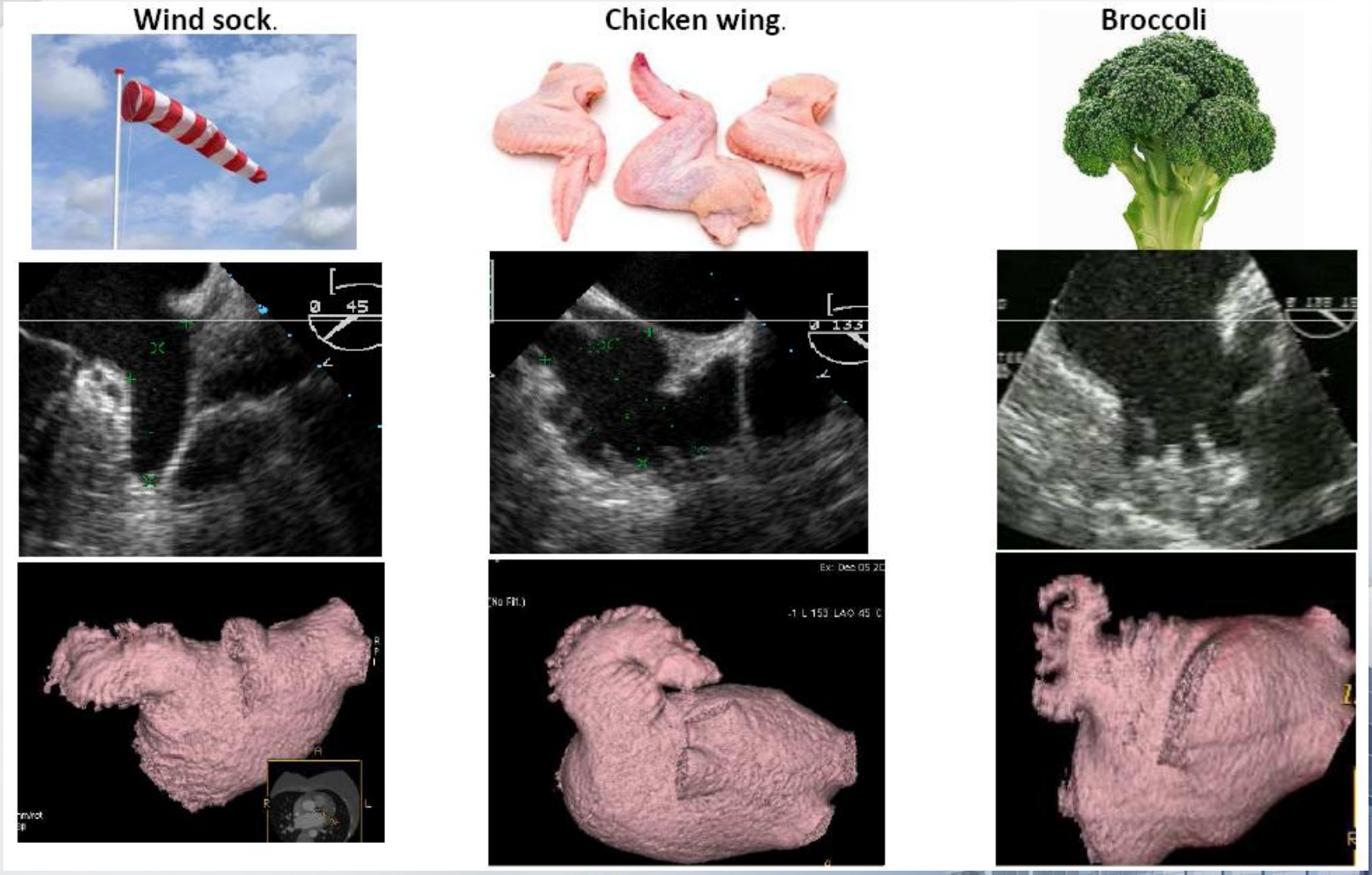
1885 제중원 창립
심장혈관병원

1. Blackshear JL. Odell JA., *Annals of Thoracic Surgery*. 1996;61:755-759

LAA anatomy



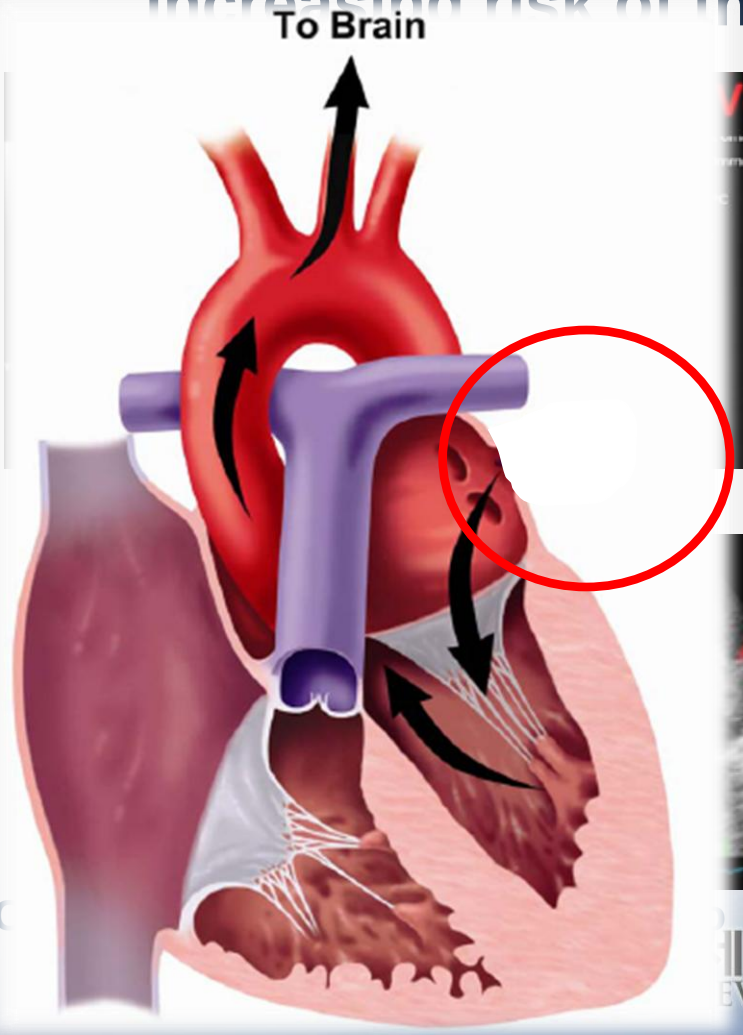
LAA Morphology

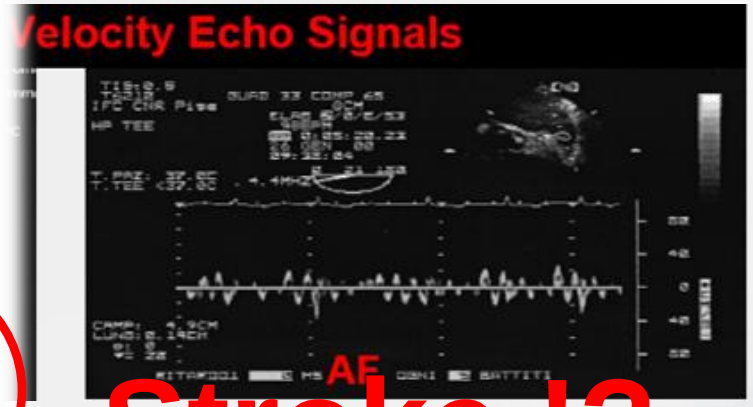


By Courtesy of Dr. Tim Betts

Hemodynamic Changes in LAA with AF

→ **With AF, LAA blood flow velocity decreases, increasing risk of thrombus formation**



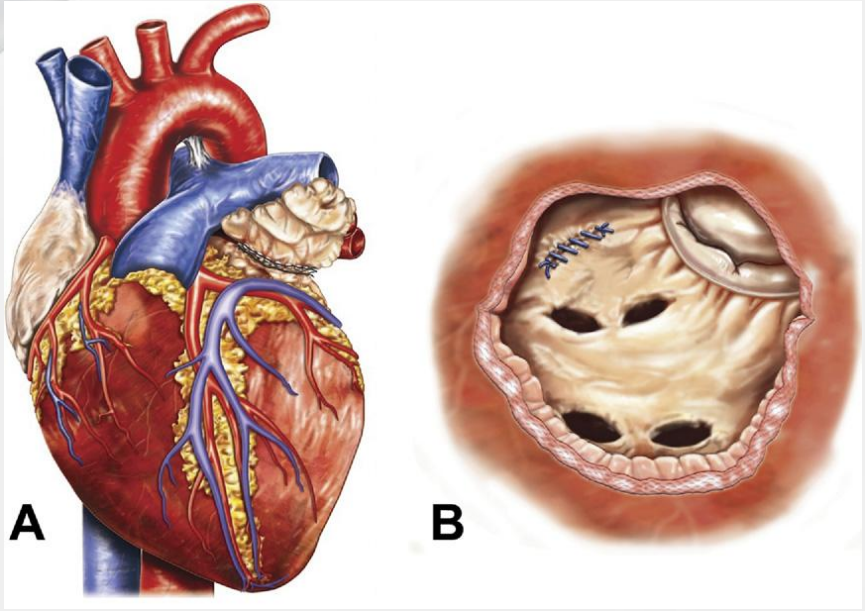


Mean peak velocity 26 cm/s

Stroke !?

Thrombus

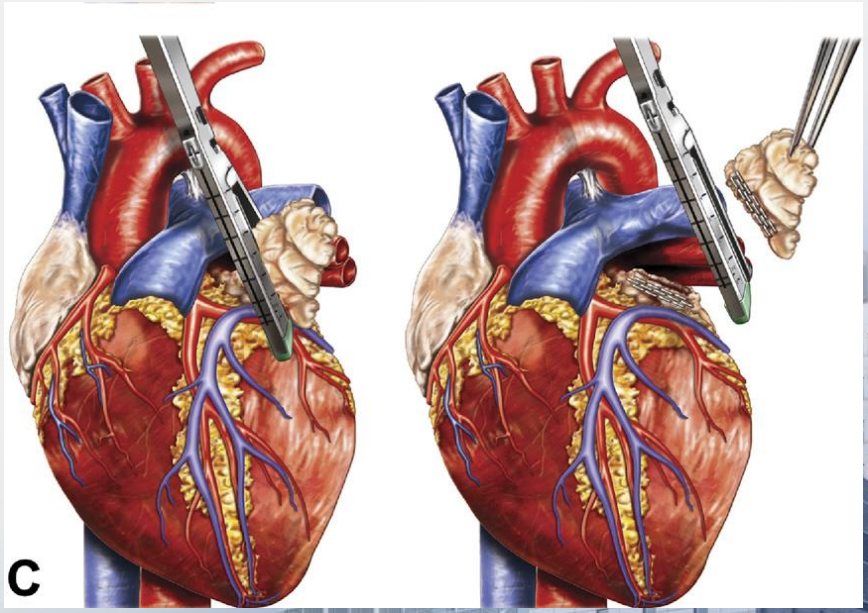
Surgical LAA Excision



(A) Epicardial suture exclusion.

(B) Endocardial suture exclusion.

(C) Stapled excision.



LAA occlusion device

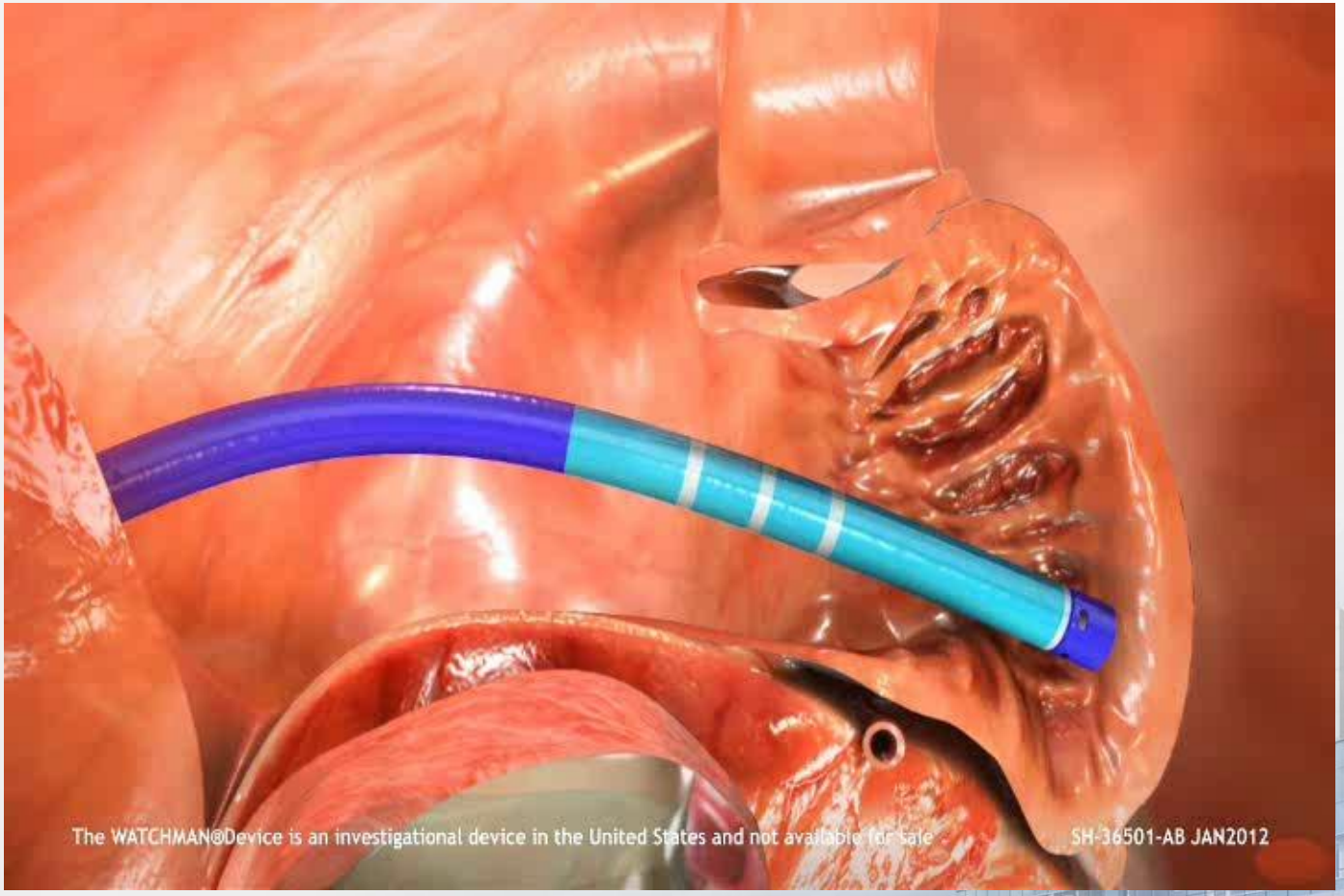
Transcatheter LAA Occlusion

Watchman (Boston Scientific)

Amplatzer Cardiac Plug (SJM)

LAA occlusion device procedure

Watchman



Watchman deployment.wmv

Amplatzer Cardiac Plug

Animation Loop.wmv

LAA occlusion Device Procedure

1. 전신마취 시행
2. **TEE 시행 : Intracardiac thrombi 확인**
3. **Septal Puncture**
4. **LAA angio 시행**
5. **LAA occlusion Device 삽입**
6. **TEE & Angio 로 위치 확인**

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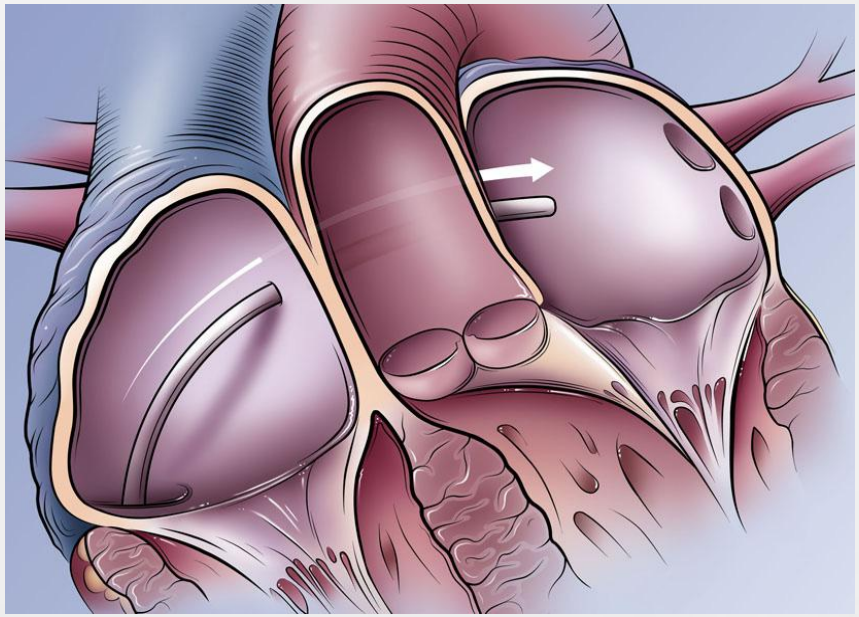
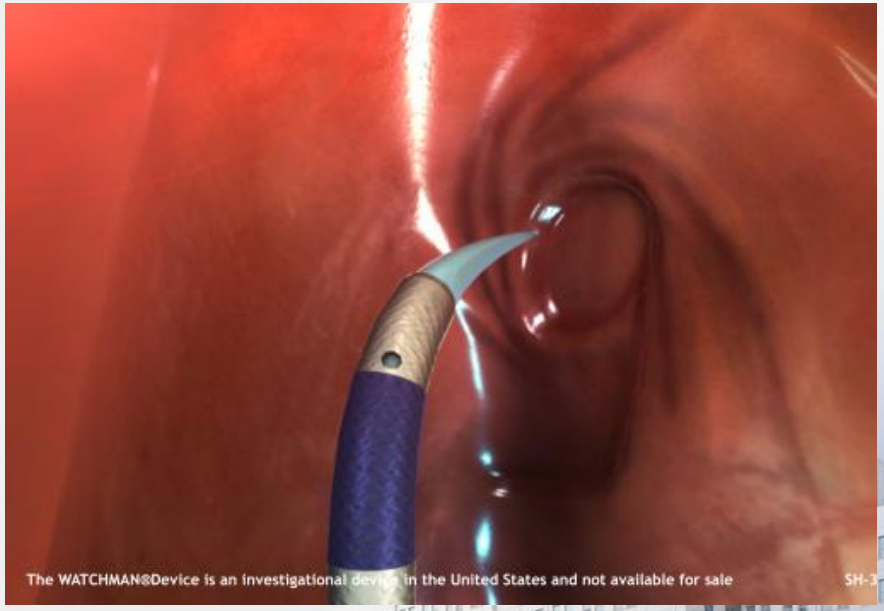
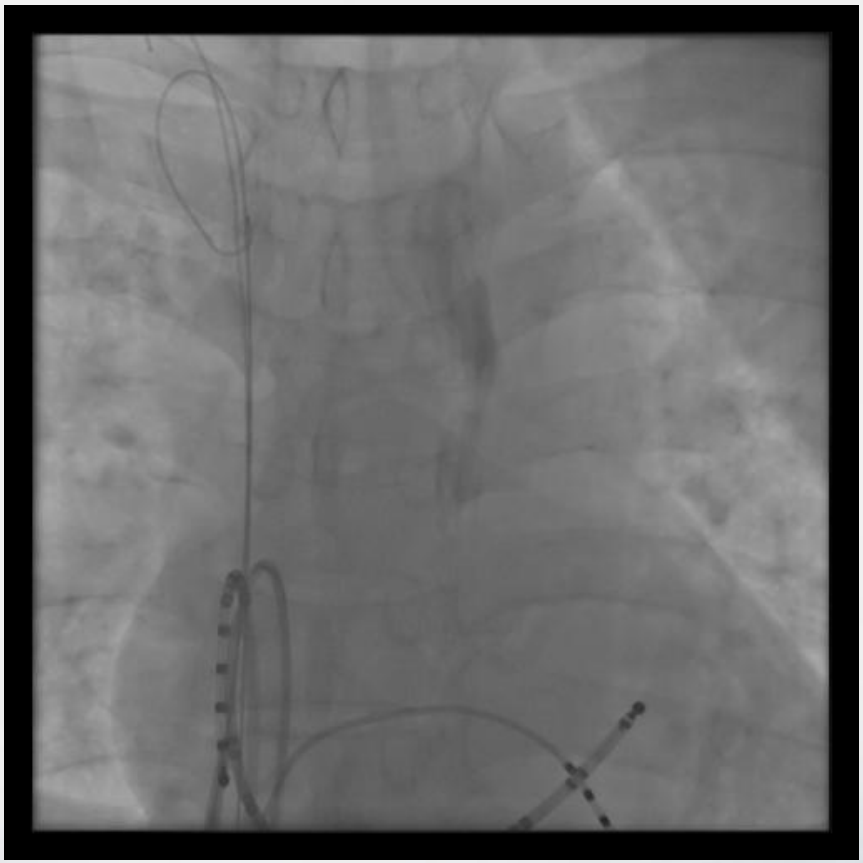
Septal Puncture





- Access heart via femoral vein
- Cross interatrial septum

Septal Puncture



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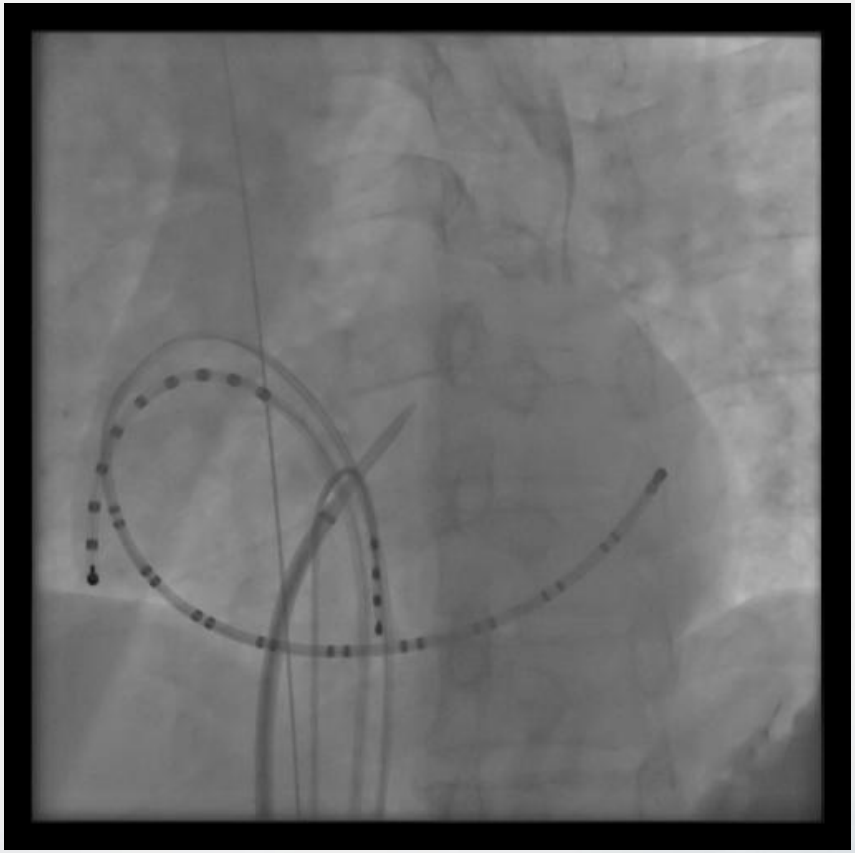
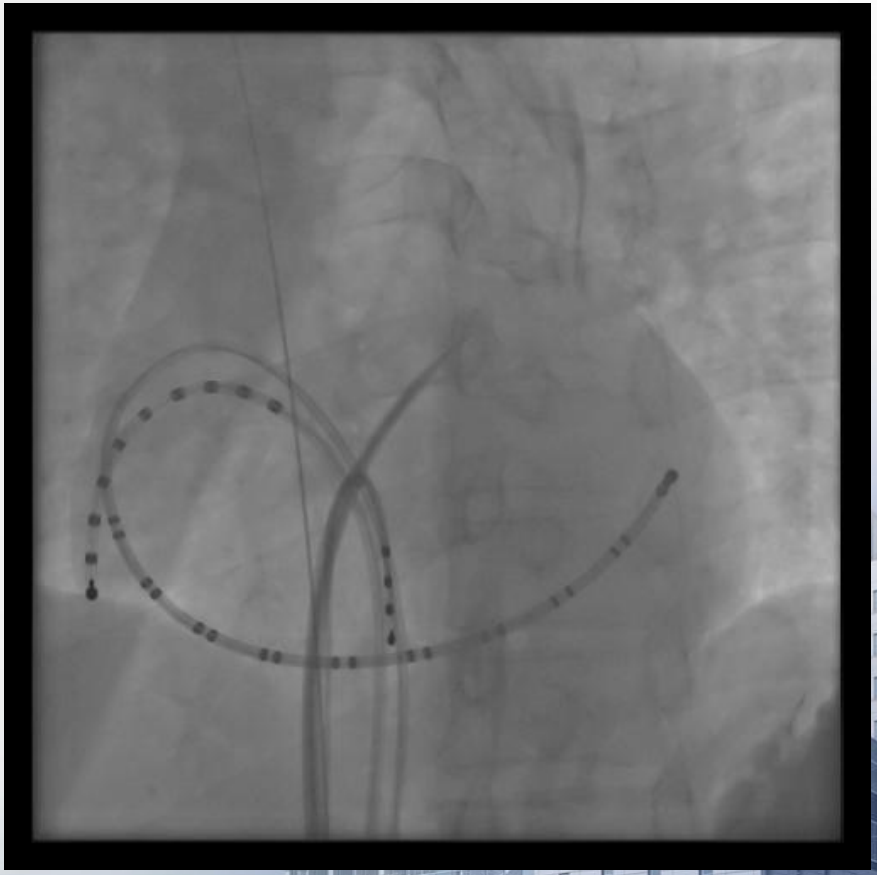
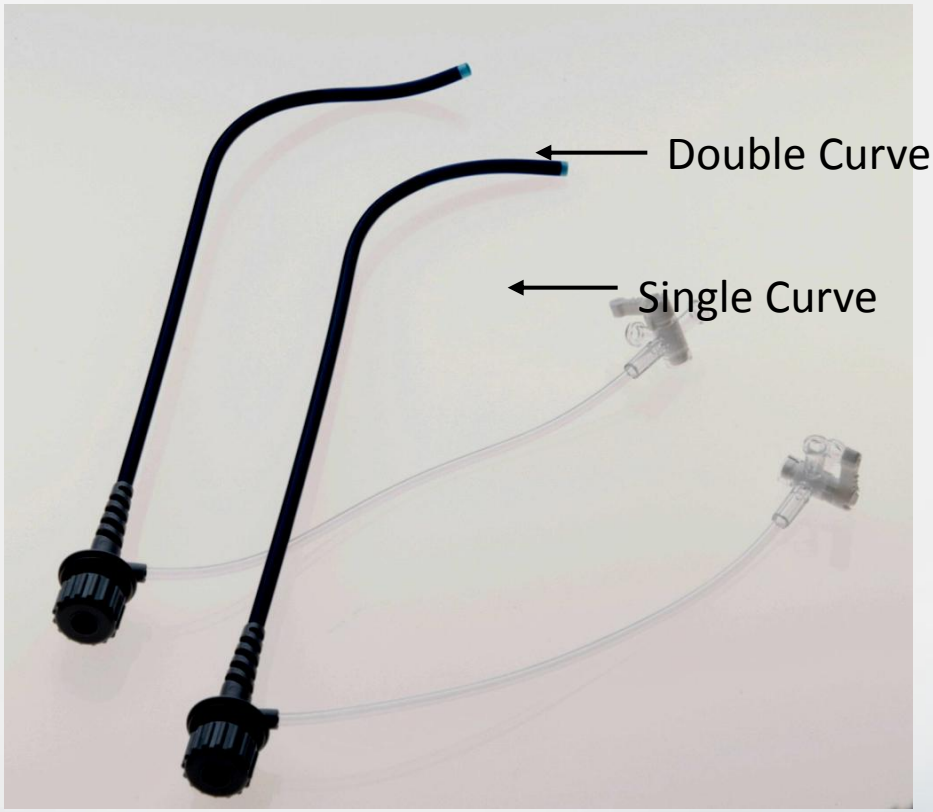
1885 세브란스병원 창립
심장혈관병원

Septal Puncture





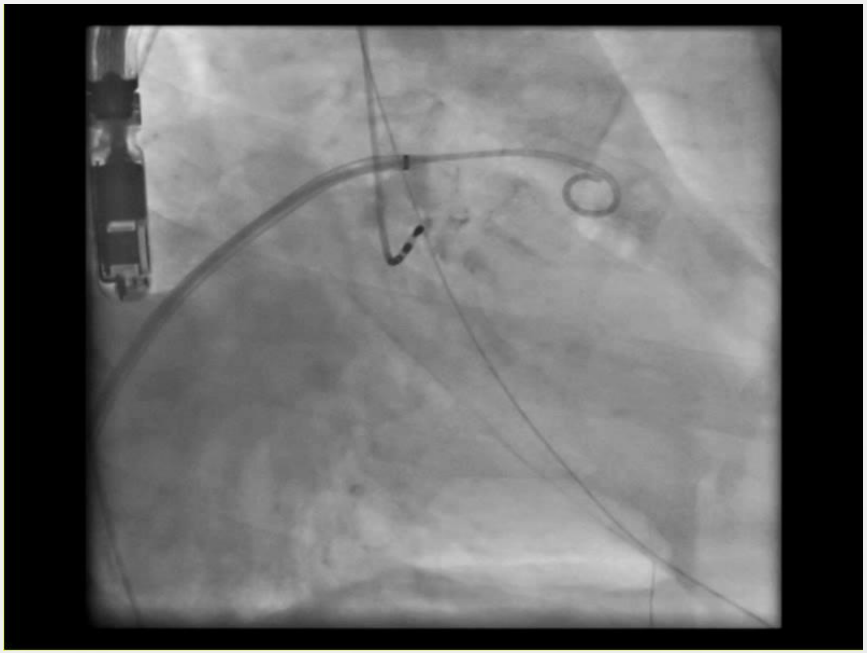
LAA Closure System Components : Transeptal Access System



Closure System Components

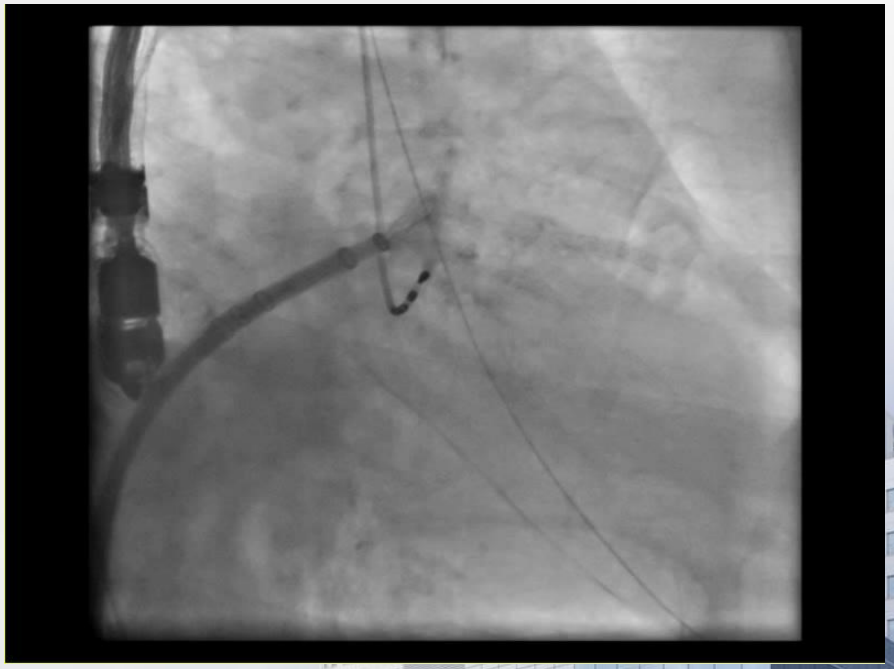
Preformed curve shapes guide position in LAA

Watchman Implantation



K1.wmv

LAA angiogram



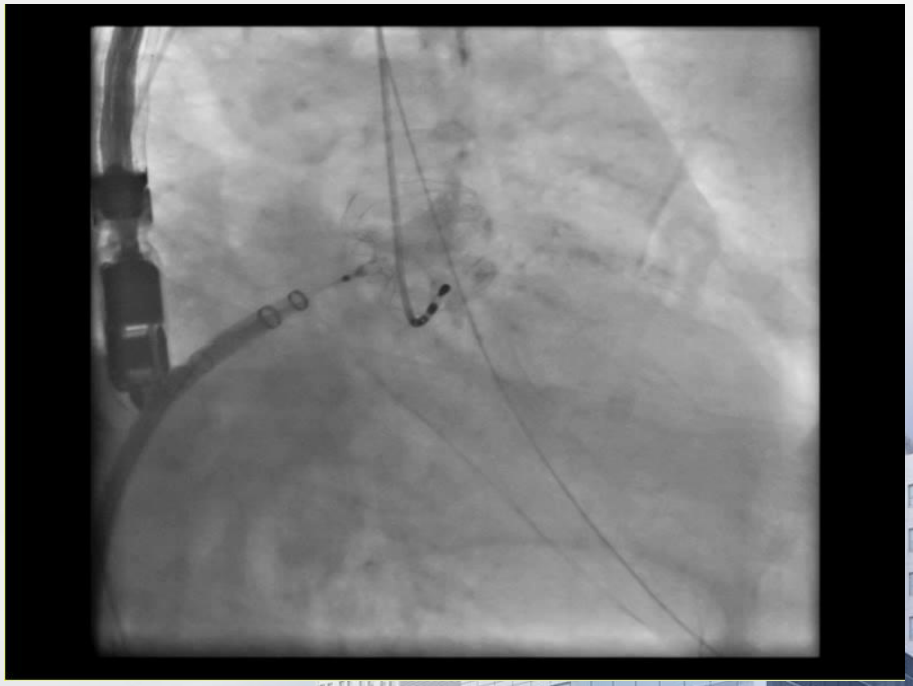
K2.wmv

Deployment

Watchman Implantation

K3.wmv

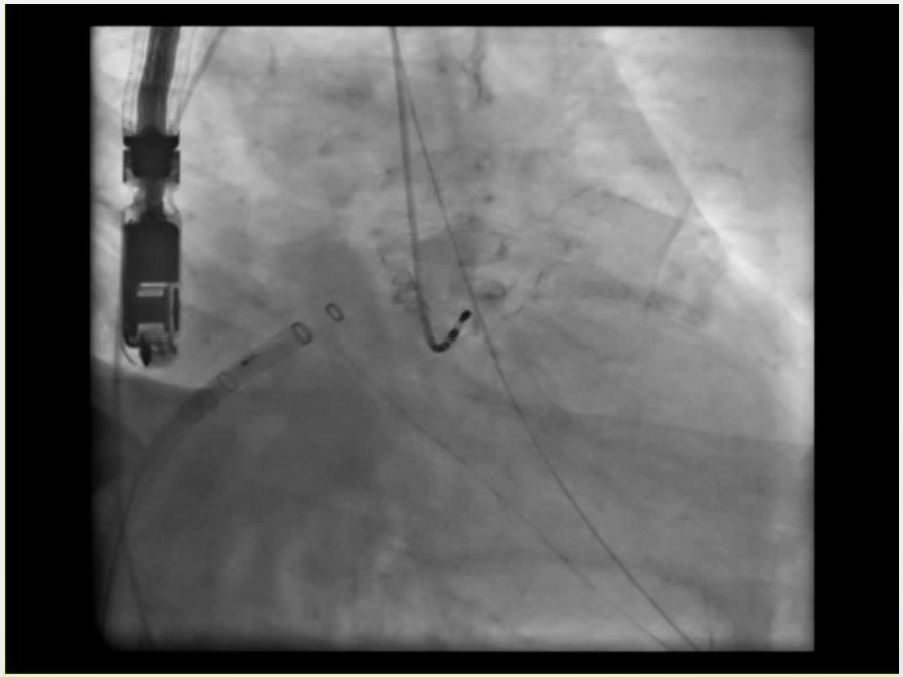
1st Confirmation of placement



K4.wmv

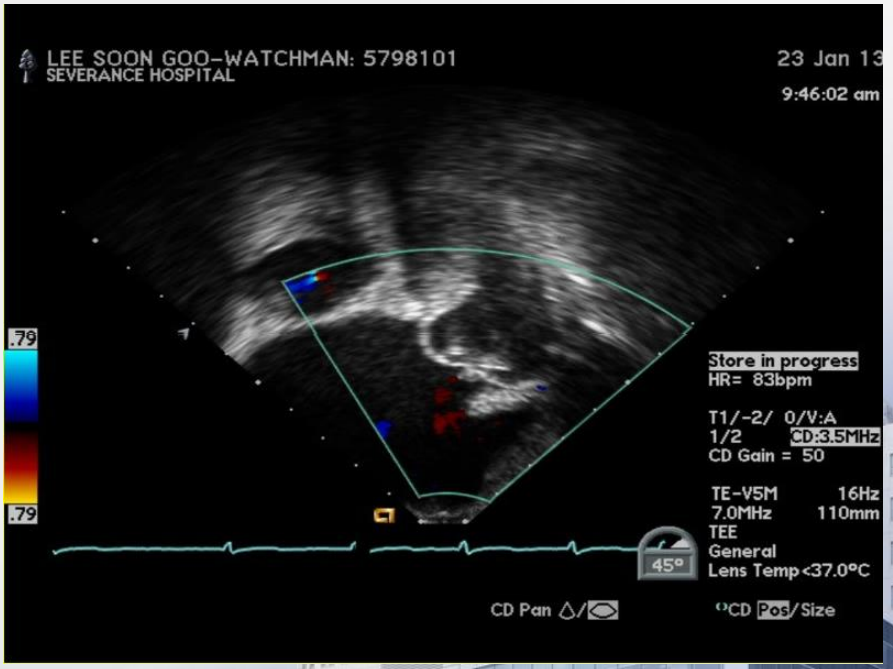
2nd Confirmation of placement

Watchman Implantation



K5.wmv

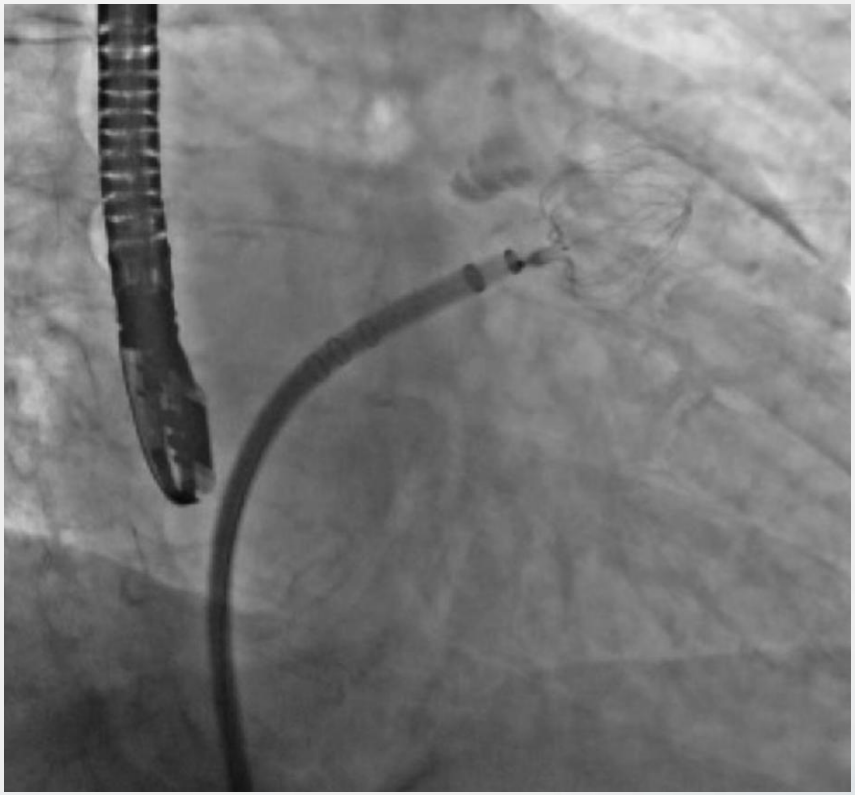
Detachment

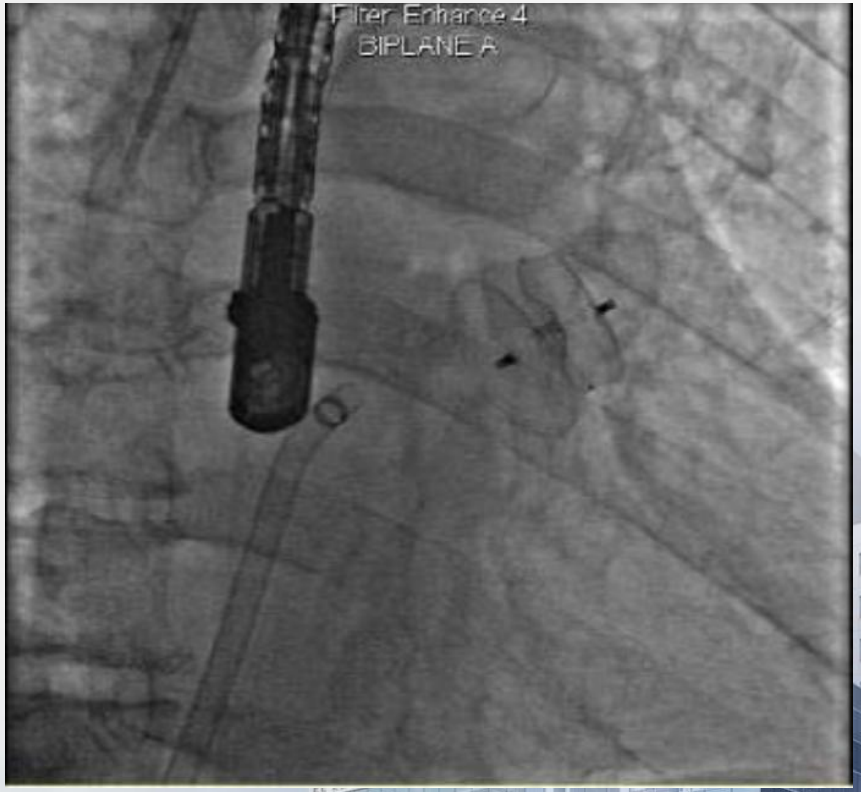


K10.wmv

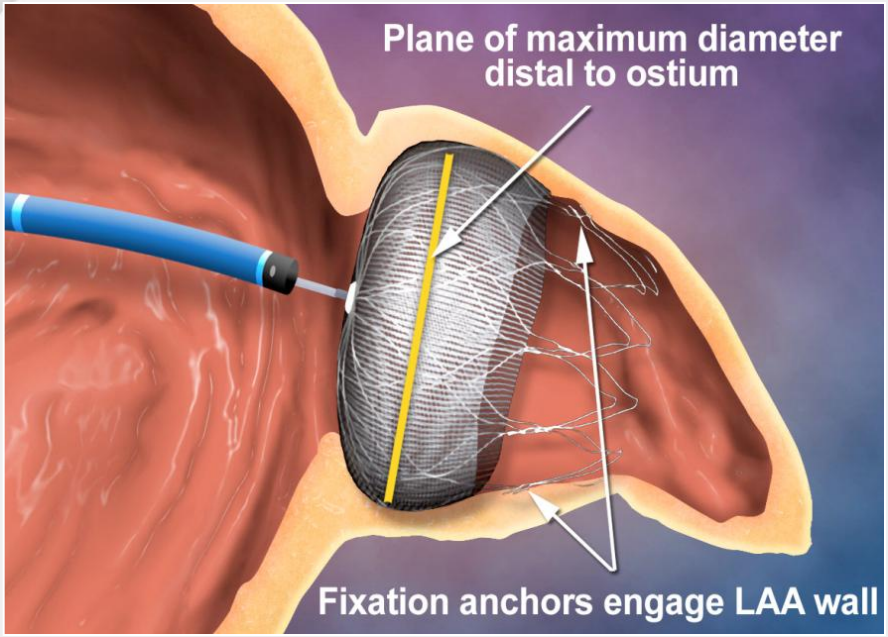
Confirmation of sealing by TEE

LAA occlusion device 삽입





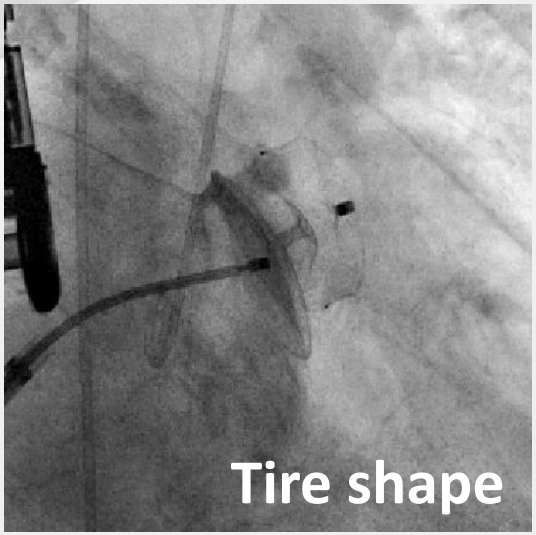
Landing Zone & Sizing

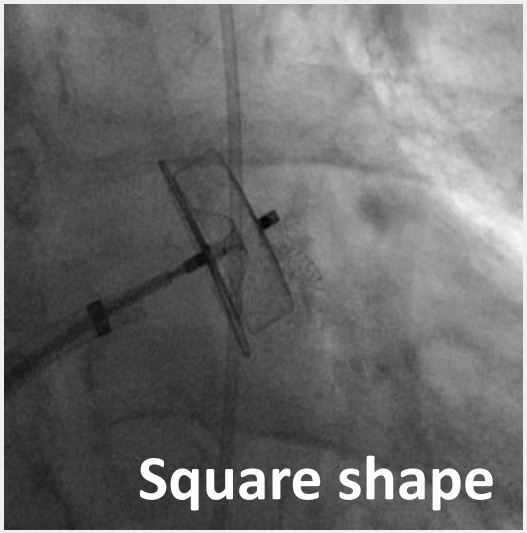


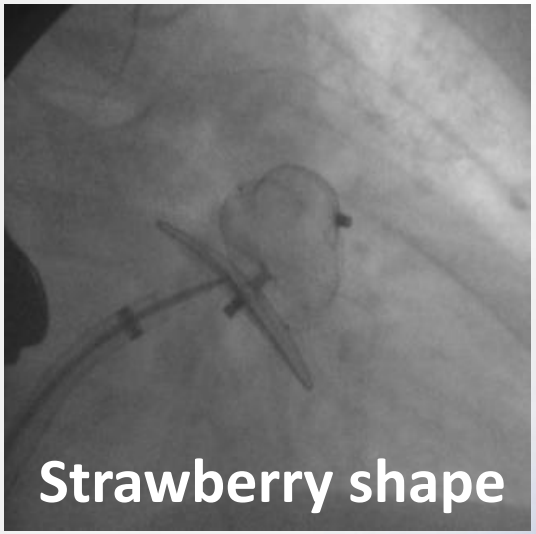
Maximum LAA Ostium (mm)	Device Size (mm) *(uncompressed diameter)*
17-19	21
20-22	24
23-25	27
26-28	30
29-31	33

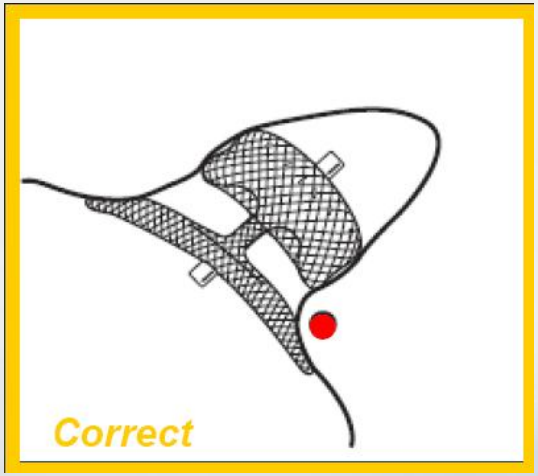
- **Measure LAA ostium in 4 TEE views: 0, 45, 90 & 135 degrees**
- **8-20% oversizing**

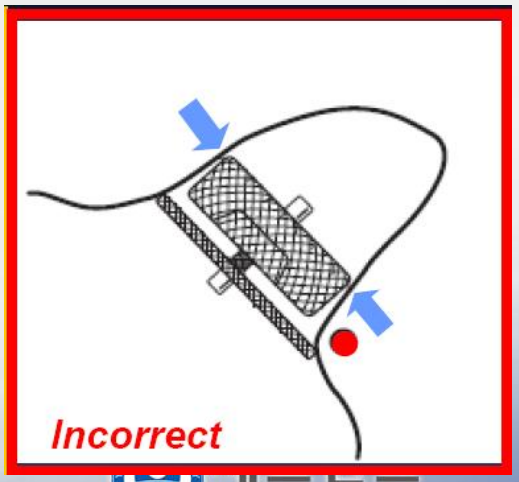
ACP Sizing

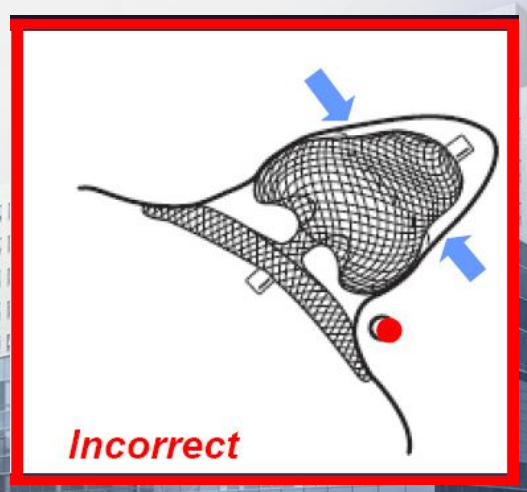












Anticoagulation

- During the procedure
  - Heparin to maintain 200-250 sec of ACT
  - Check ACT every 30 minutes
- After the procedure
  - Warfarin to maintain 2.0-3.0 of INR for at least 45 days

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Complications of LAA Occlusion

- Pericardial effusion : 5.0%
- Device-associated thrombus : 4.2%
- Stroke : 0.9%
- Bleeding : 0.8%
- Vascular complications : 0.8%
- Device embolization : 0.6%

V Reddy, et al. Circulation, 2011

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