Novel Concept of Catheter-Based Treatment for Tricuspid Regurgitation (Cerclage-T leaflet)
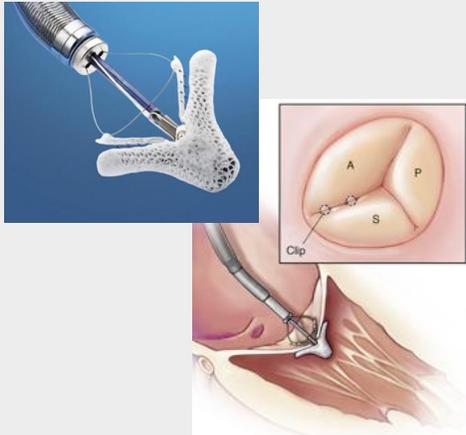
A Preliminary Animal Experiment in Swine Model

Min-Ku Chon, MD, PhD

Pusan National University Yangsan Hospital, Yangsan, South Korea

Transcatheter Therapies for Tricuspid Regurgitation
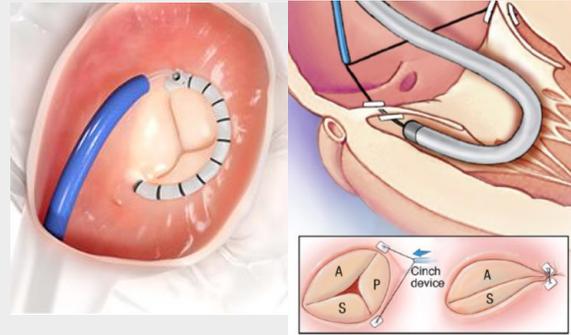

Leaflet correction

- Mitraclip (Abbot)

Limitations

- Surgical predicate
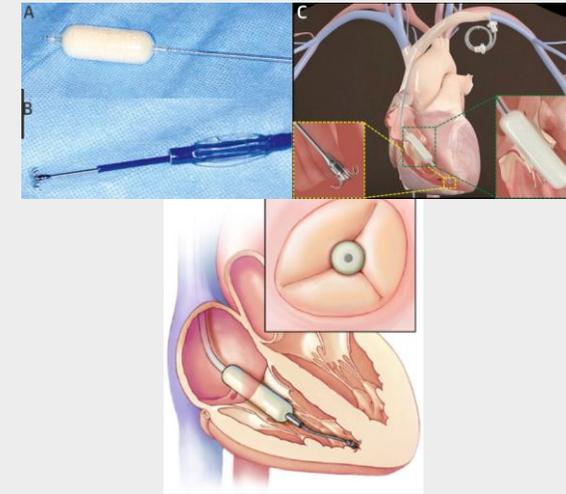- Technical difficulty
- Device detachment

Annuloplasty

- Trialign system (Mitralign)
- Cardioband (Edwards Lifesciences)
- TriChinch device (4TechCardio)

- Device detachment
- Surgical predicate
- Technical difficulty

Coaptation

- FORMA repair system (Edwards Lifesciences)

- Device detachment
- Surgical predicate
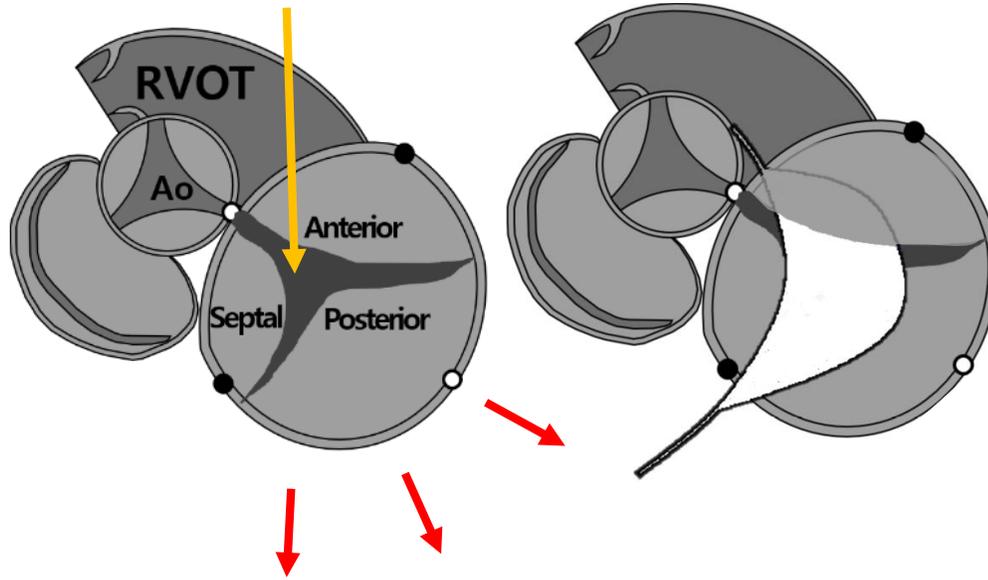- Cardiac perforation

[1] Fender EA, et al. Heart 2018;104:798–806
[2] Francisco Campelo-Parada et al. JACC 2015; 66(22):2475-2483
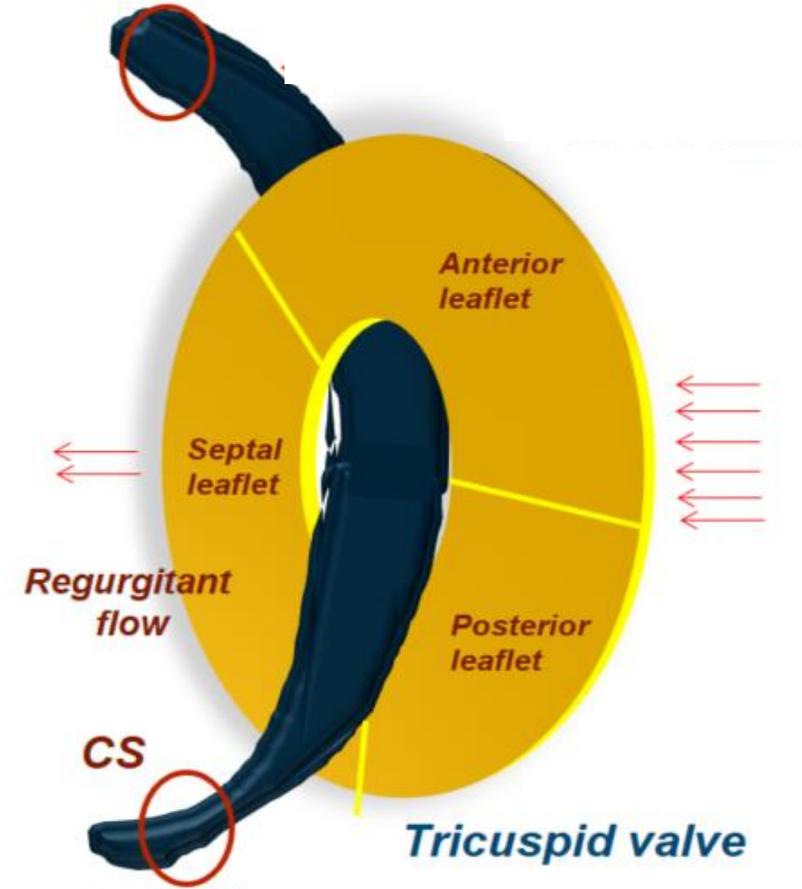[3] Azeem L, Antonio M. JACC 2017;49(14):1807-1810

What is 'Cerclage T- leaflet' ?

Novel concept to reduce TR
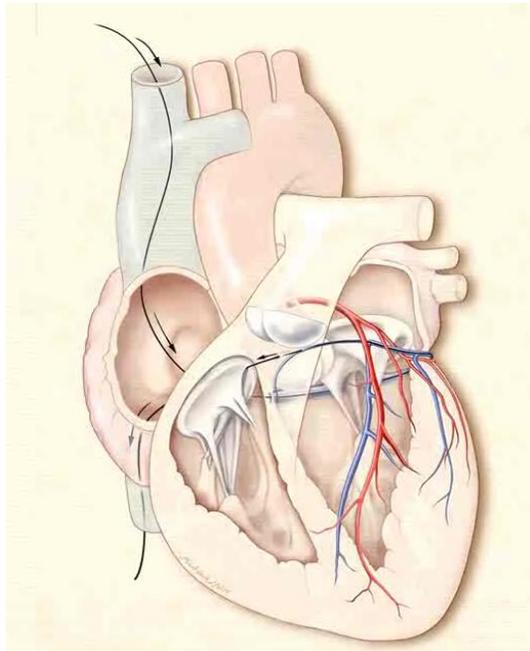
Regurgitant orifice

Artificial septal leaflet extension

- **Easy and simple approach**
- **Adding additional artificial leaflet at tricuspid valve**

Platform of Cerclage-T leaflet
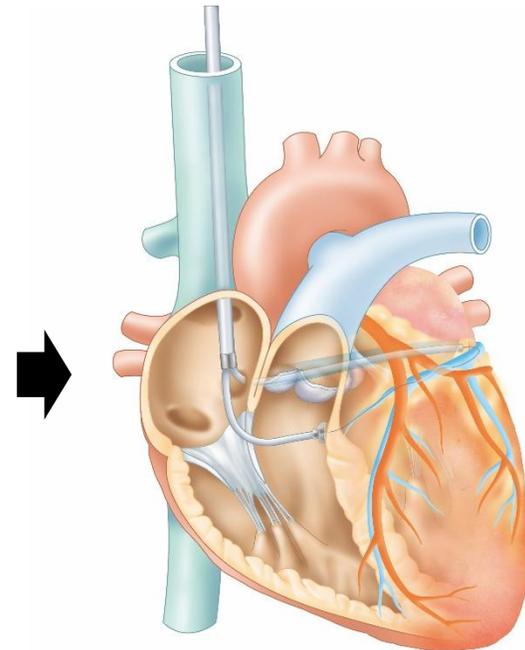
Mitral Loop Cerclage Annuloplasty

Basic Concept of cerclage	Animal feasibility study	First In Man Study KFDA 2015

Mitral Cerclage[1]

Mitral Loop Cerclage[2]

Severe Functional MR (n=5)[3]

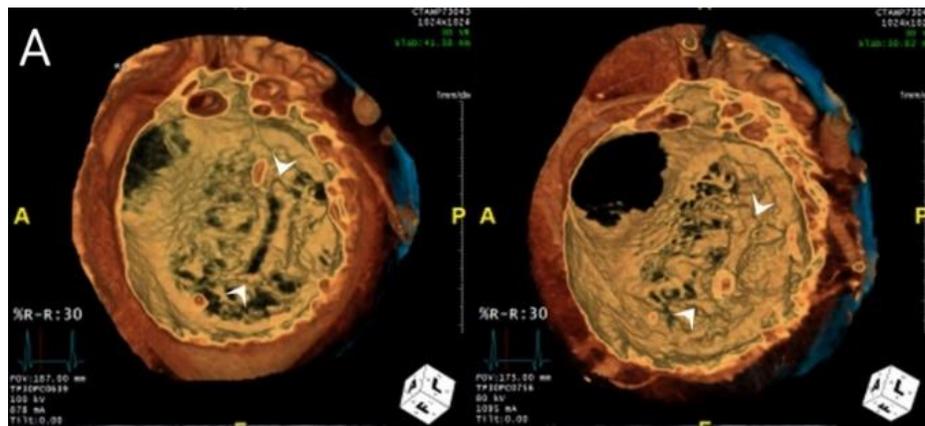[1] Kim JH et al. JACC 2009; 54 :638-651

[2] Kim JH et al. Eurointervention 2016;11:1669-1679
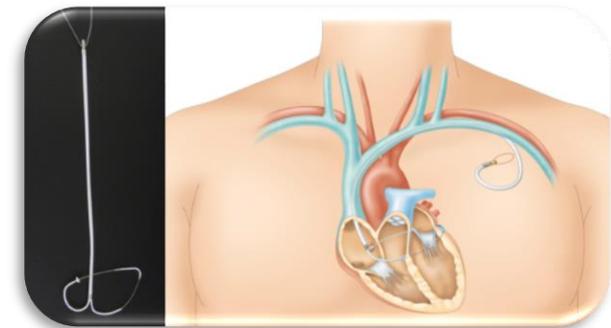
[3] Park YH, Chon MK et al. JACC:Cardiovascular intervention 2017;10(6):597-610

A Representative Case of Mitral loop Cerclage (Platform)

74F, NICM, NYHA IV dyspnea despite aggressive medical therapy for 1yr

Baseline	1 month	6 month	18 month
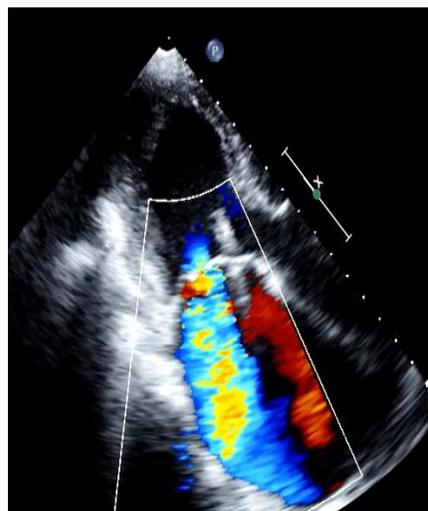
- ERO 0.34 cm²
- RV 63 ml
- Atrial fibrillation
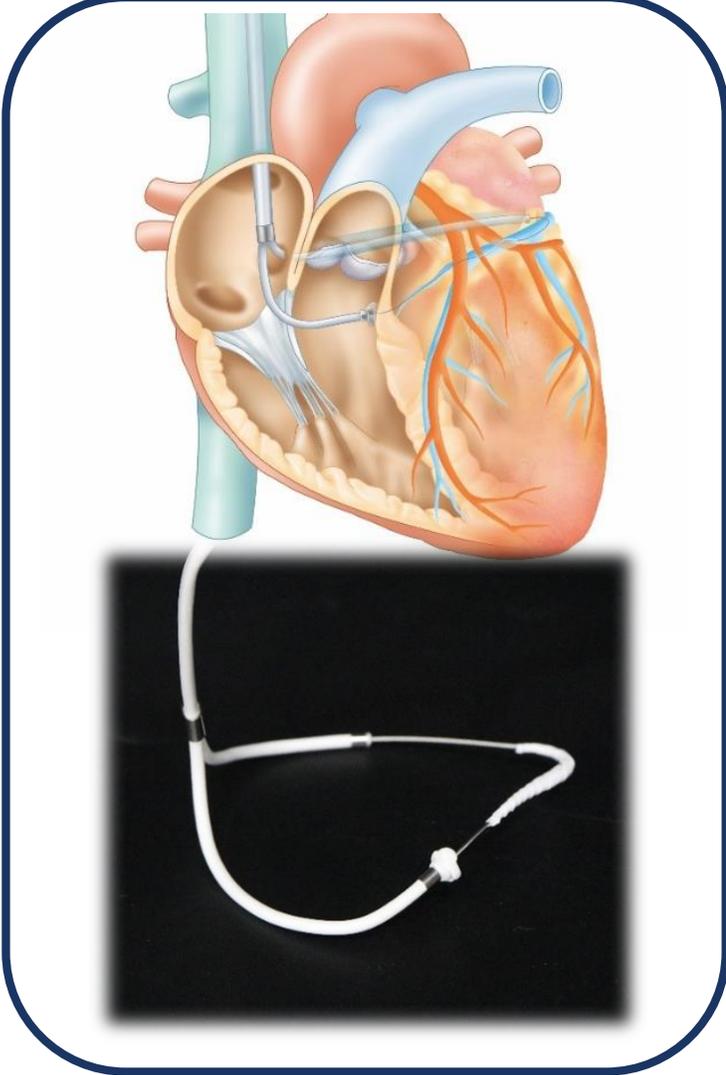
- ERO 0.14 cm²
- RV 25 ml
- Normal sinus R

- ERO 0.10 cm²
- RV 23 ml
- Normal sinus R

- Mild MR
- Normal sinus R
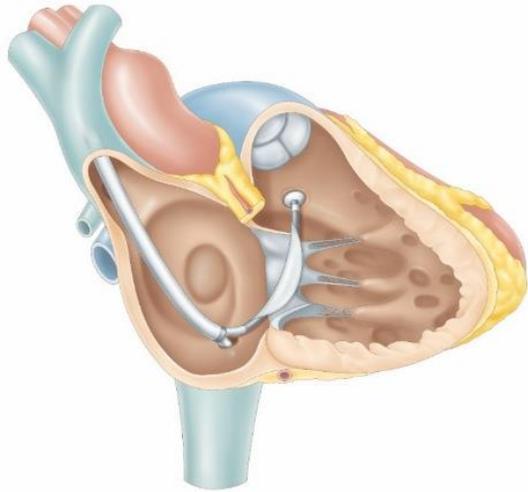
The structure of Cerclage T-leaflet
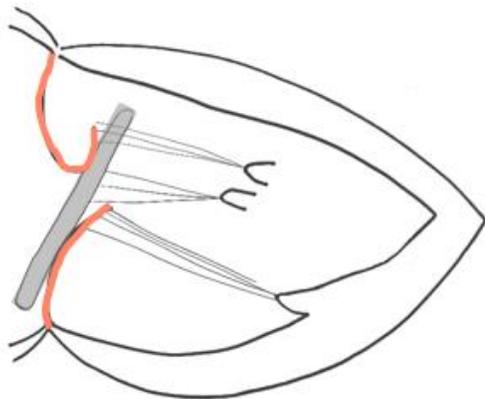

Mitral Loop Cerclage

Cerclage T-leaflet

Working mechanism of T-leaflet

- *Provides stable support by Mitral Loop Cerclage as **Platform***

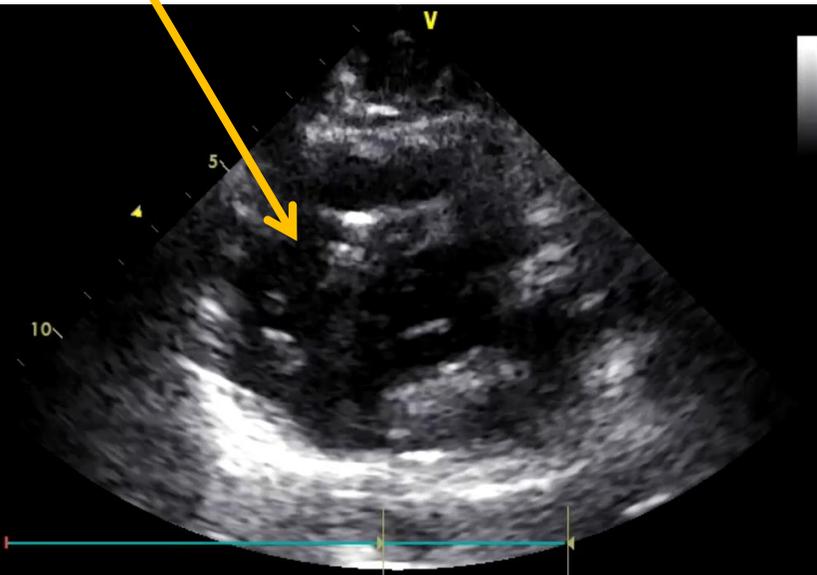- *Role of accessary leaflet with septal leaflet extension (**leaflet extension**)*

- *Concordant motion with native tricuspid leaflets (**expanding the coaptation surface**)*

Neoleaflet implantation in Normal valve
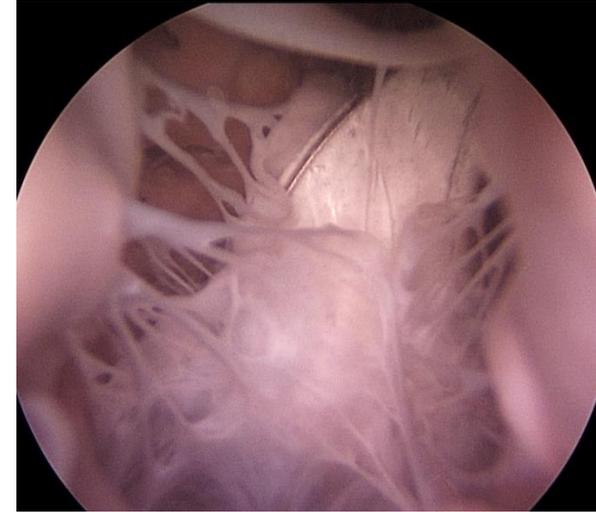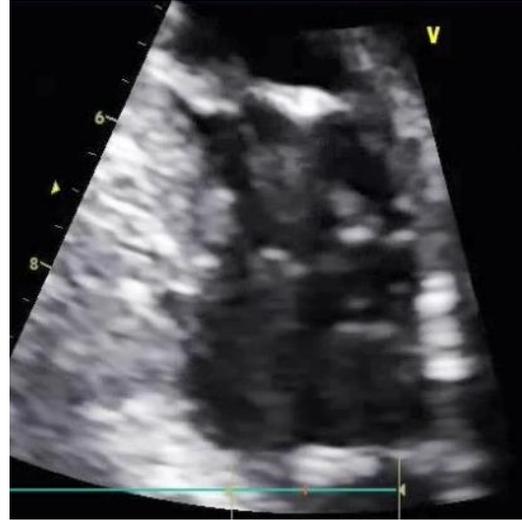
There was no damage on valve structure after the device

leaflet extension (membrane)
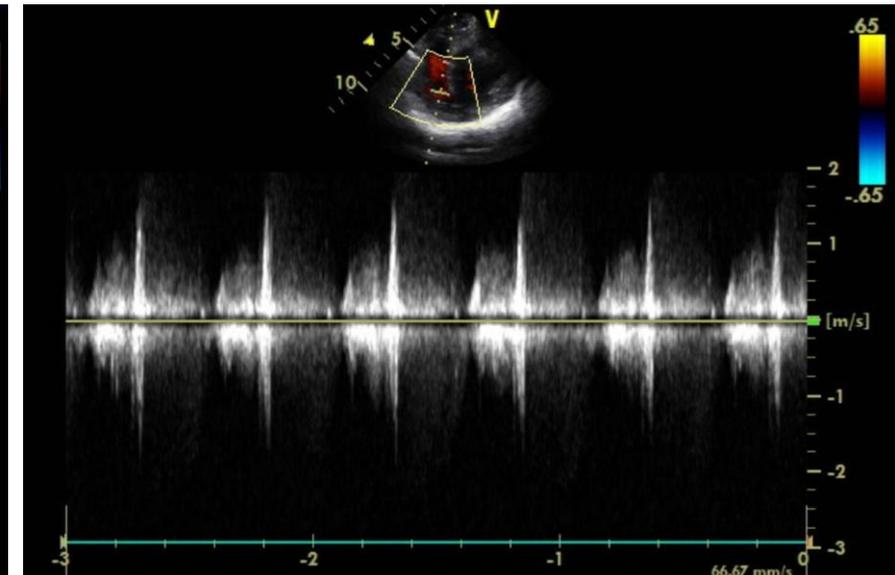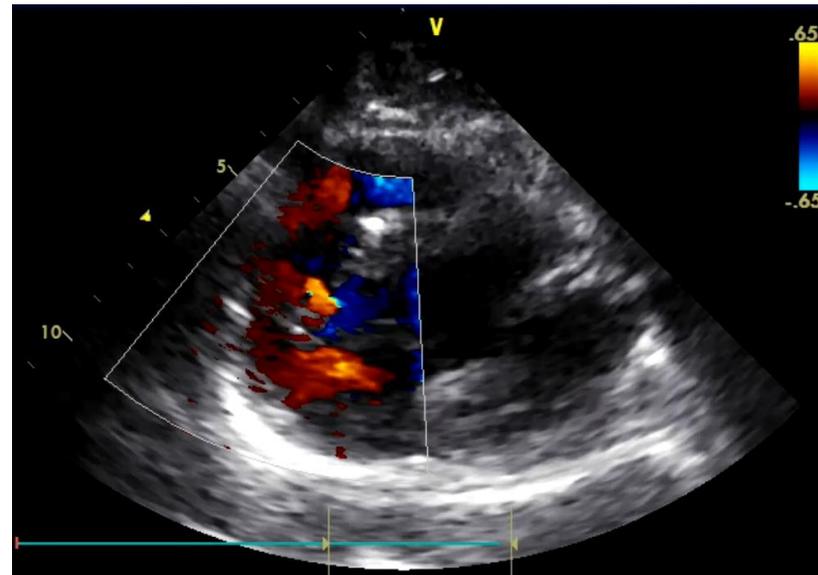
Concordant motion with native tricuspid

Atrial view

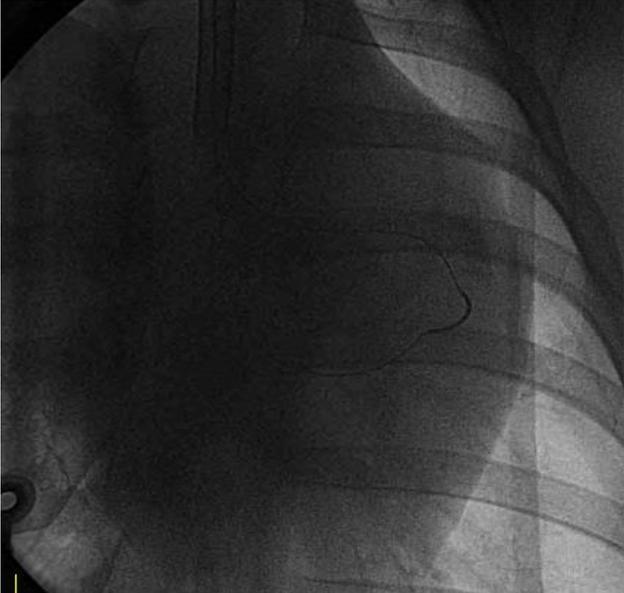Ventricle view

Better leaflet motion with the device in flail TV
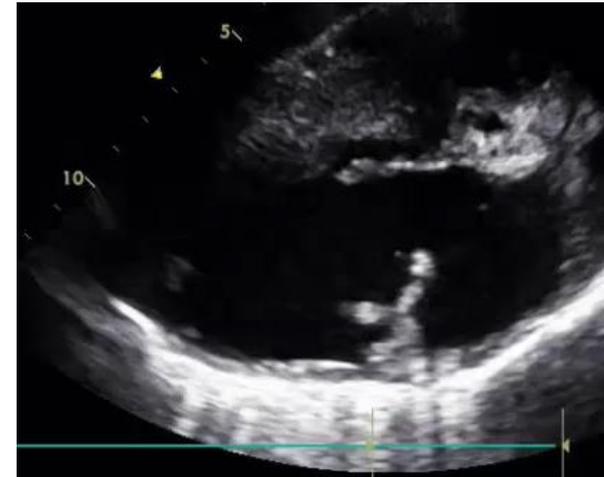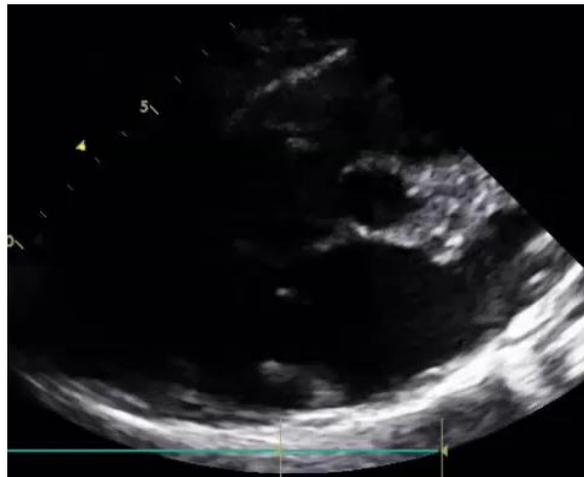
Cerclage T-leaflet Procedure

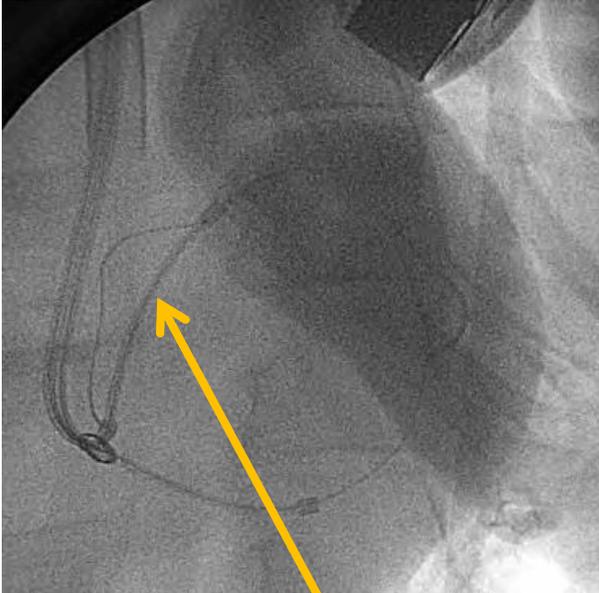**Wiring : SVC-> CS -> IVS -> RV**
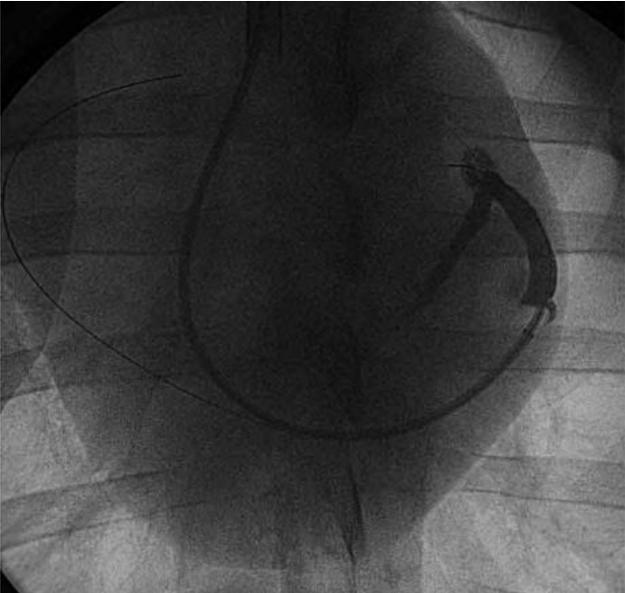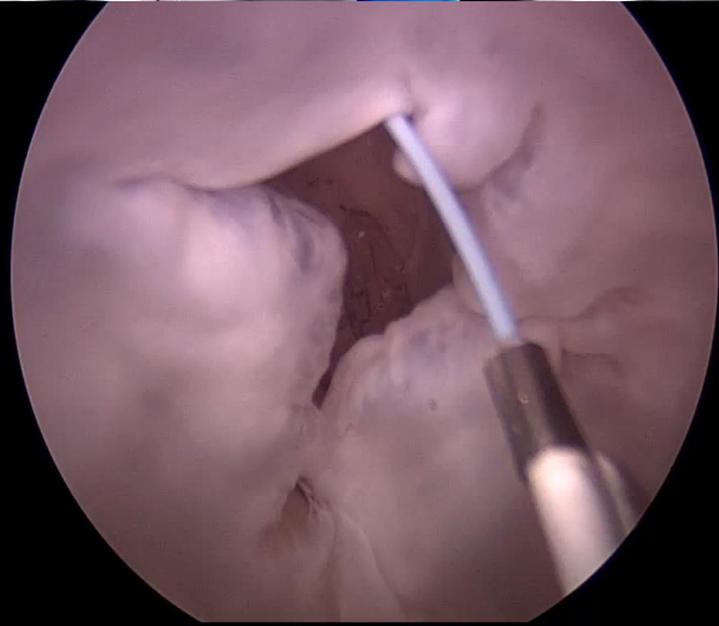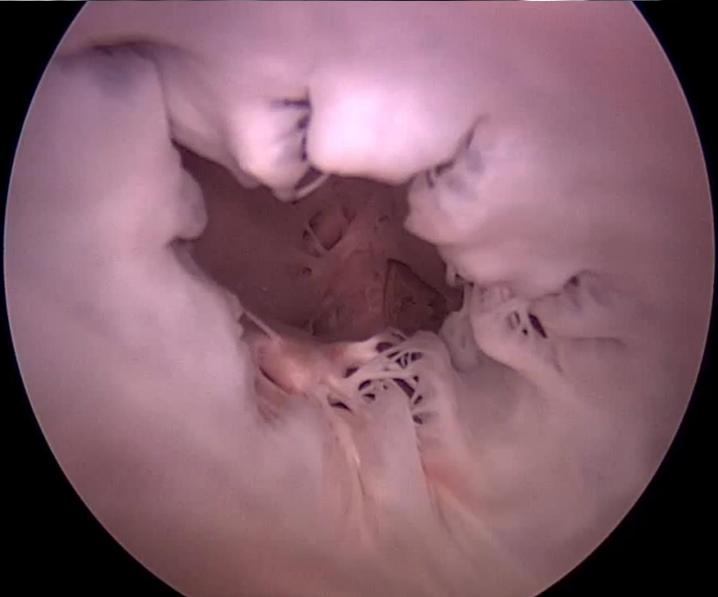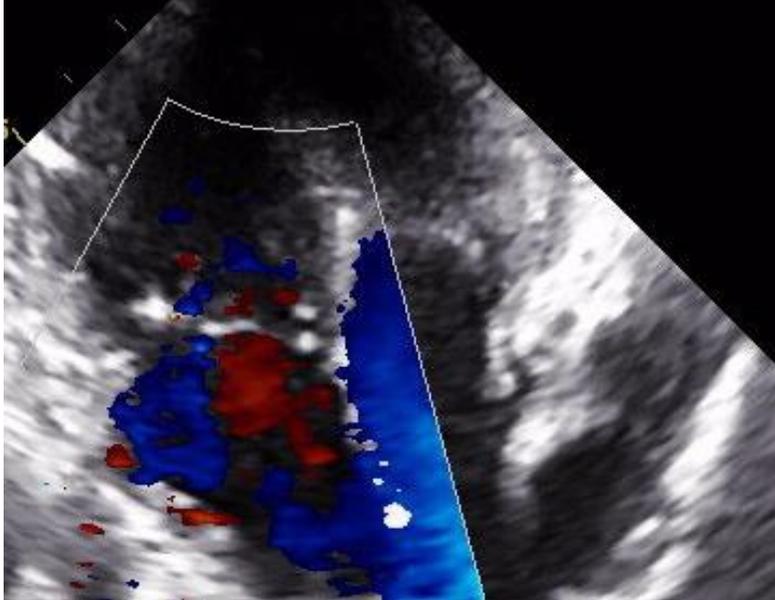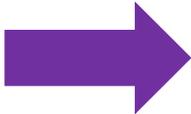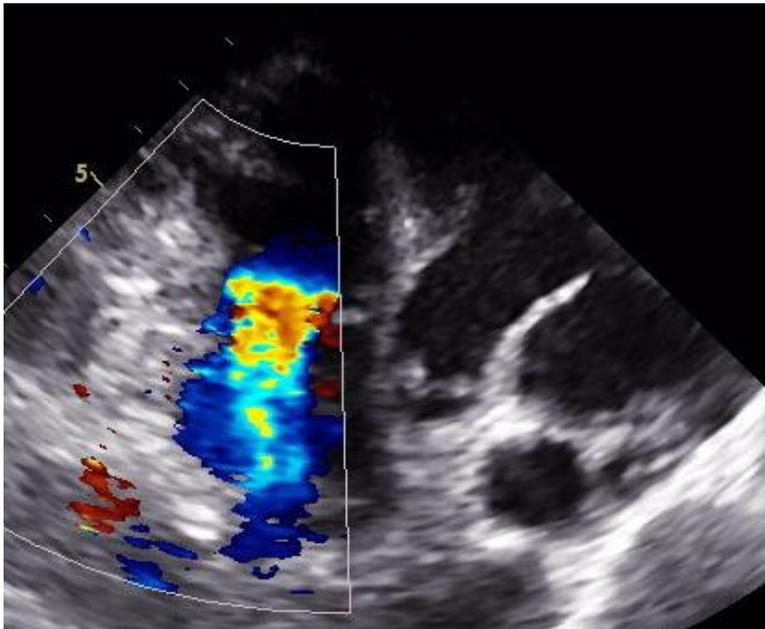
Wire recapture and change to cerclage rope
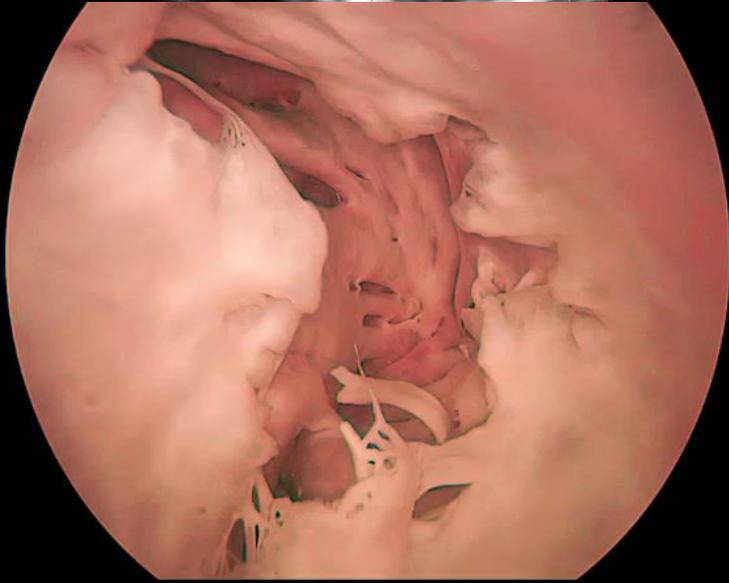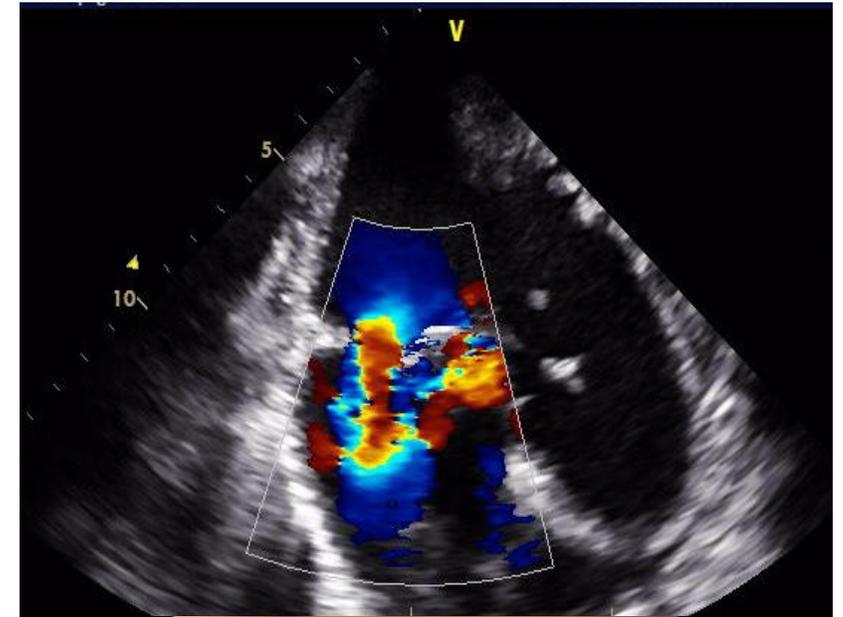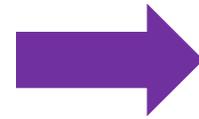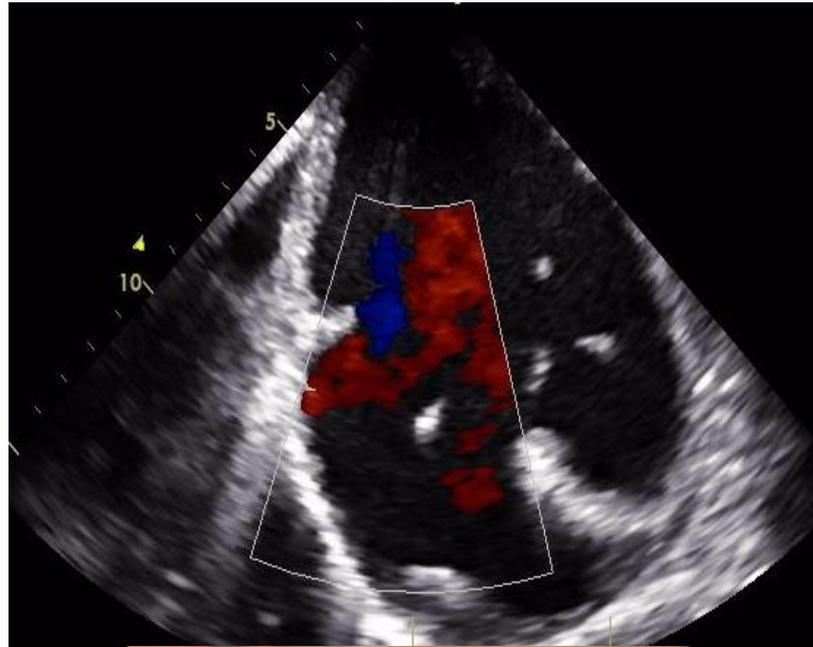
Delivery of device through the rope

Septal leaflet extension on platform of mitral loop cerclage

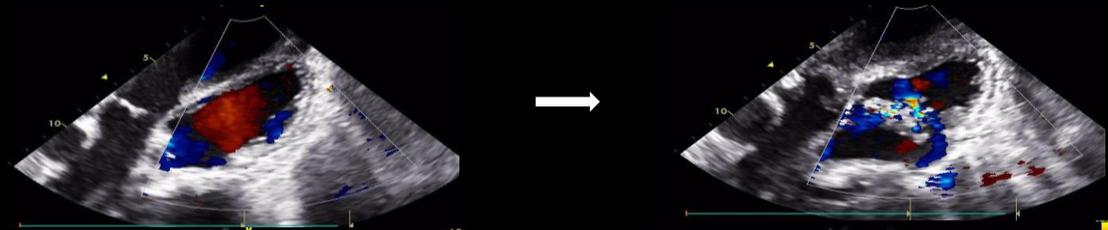# Neoleaflet implantation in severe functional TR

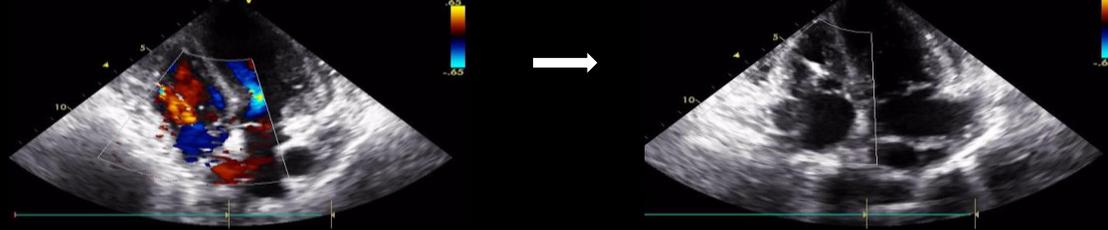# Neoleaflet implantation in destructive valve
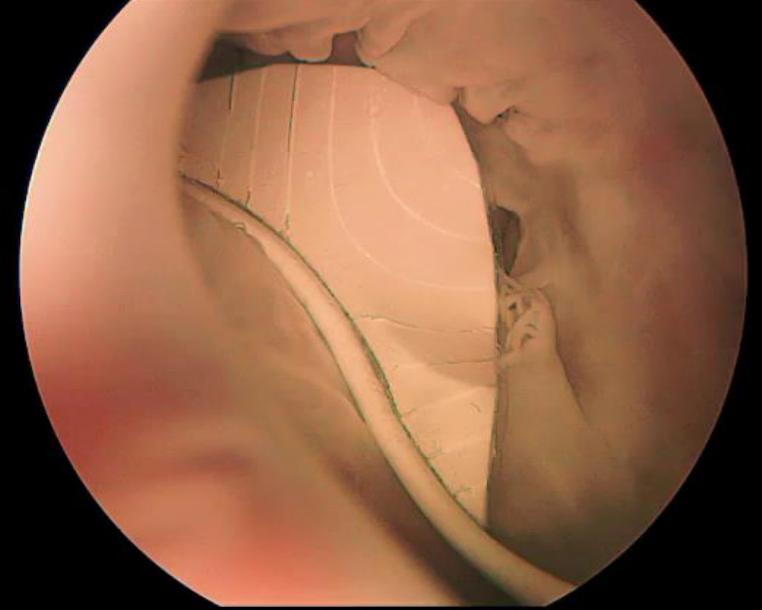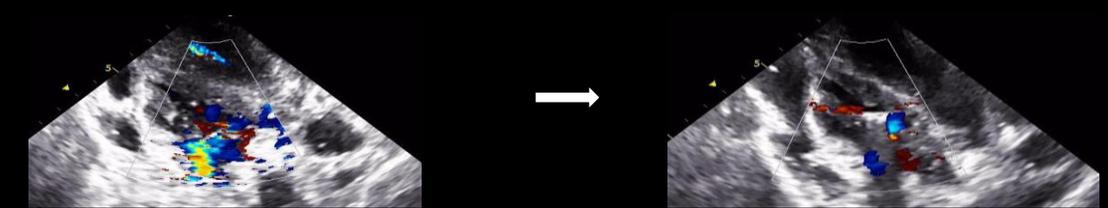
Neoleaflet implantation for treating TR
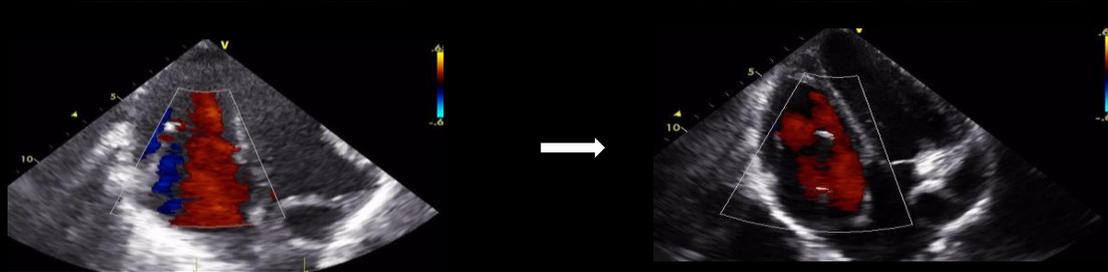
Animal 1
Functional TR moderate

Animal 2
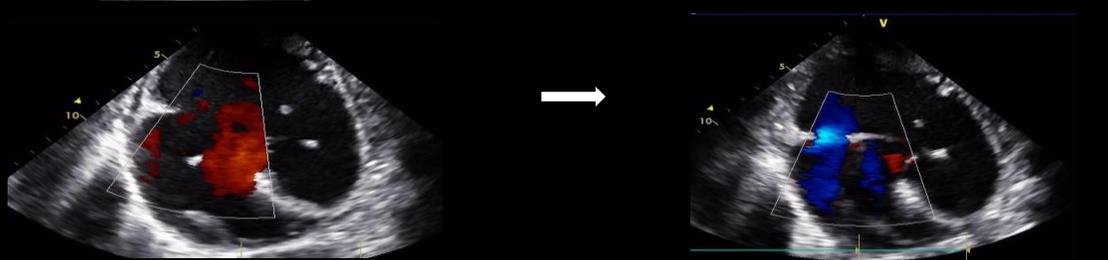Functional TR Moderate

Animal 3
Destructive TR severe, acute model

Animal 4
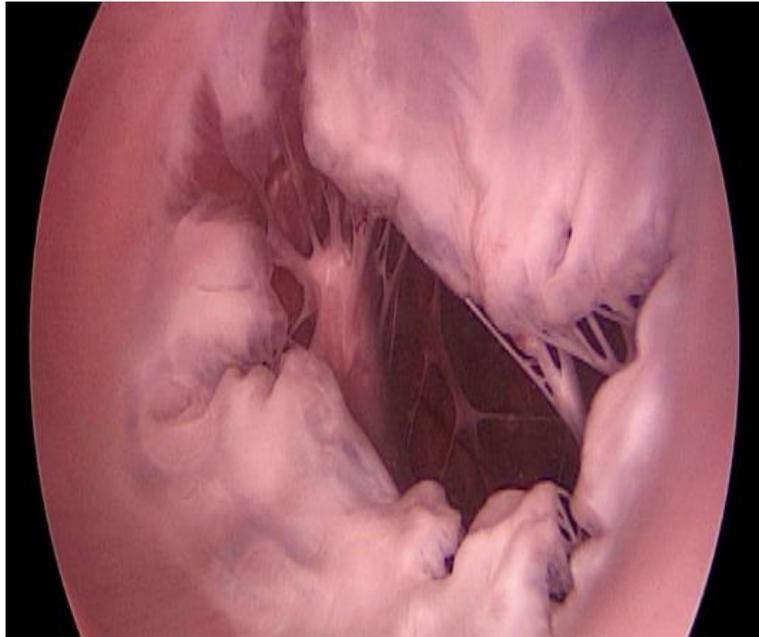Destructive TR very severe, chronic model (RV dilatation)

Animal 5
Destructive TR torrential, chronic model (RV dilatation)
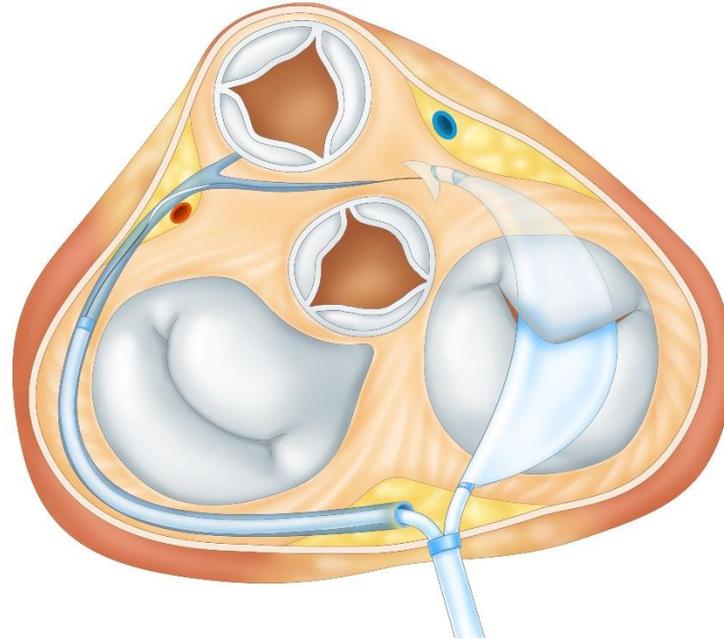
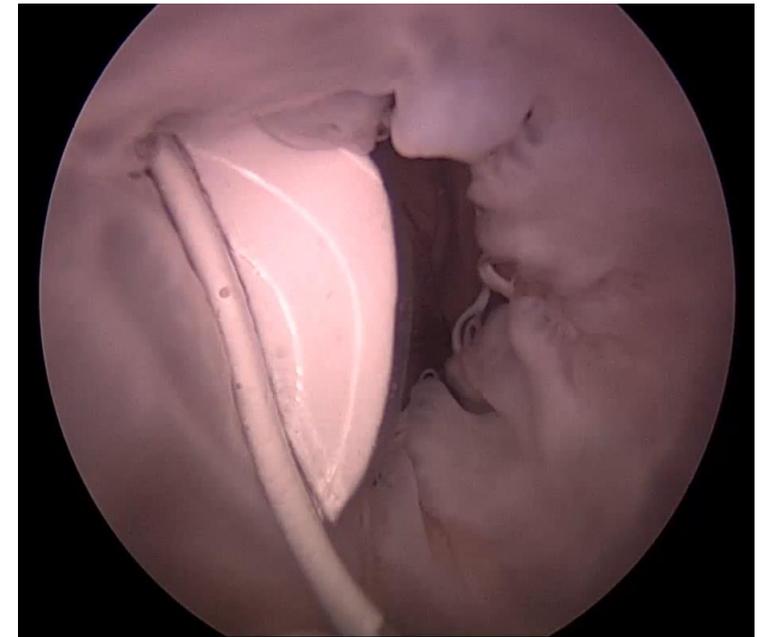# Extension of Mitral Loop Cerclage to treat TR

Mitral Loop Cerclage (MLC) + **Septal leaflet extension on MLC platform**

Functional MR being treated with cerclage tension

By one procedure with one device for treating both MR/TR at once

Functional TR being treated with cerclage T-leaflet

'BUY 1 GET 2' Procedure

Thank you for your attention