CSC 2025
CORONARY AND STRUCTURAL CONGRESS
CONGRESO CORONARIO Y ESTRUCTURAL
MADRID

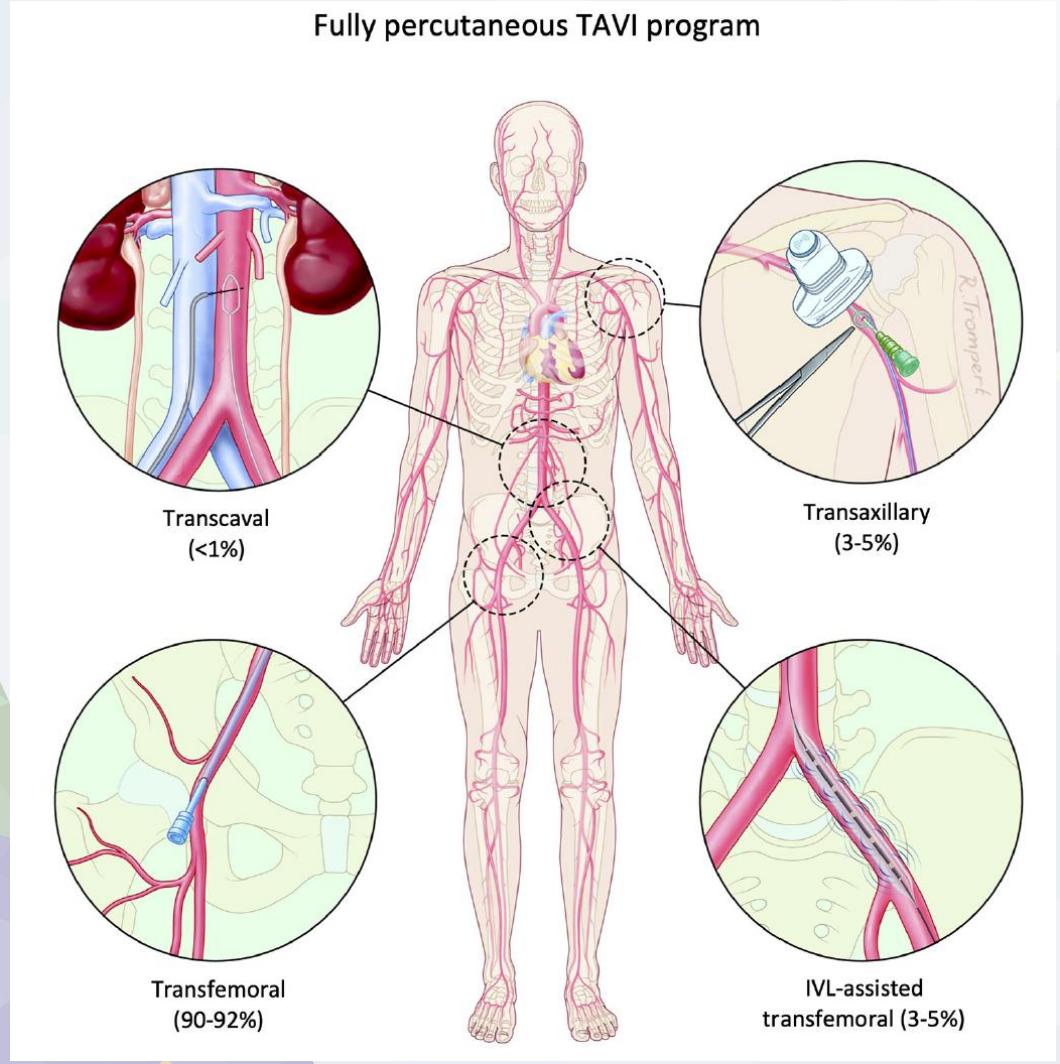
5, 6 y 7 NOVIEMBRE
HOTEL RIU PLAZA DE ESPAÑA

HOW TO DO. ACCESO HOSTIL EN TAVI
Litotricia intravascular

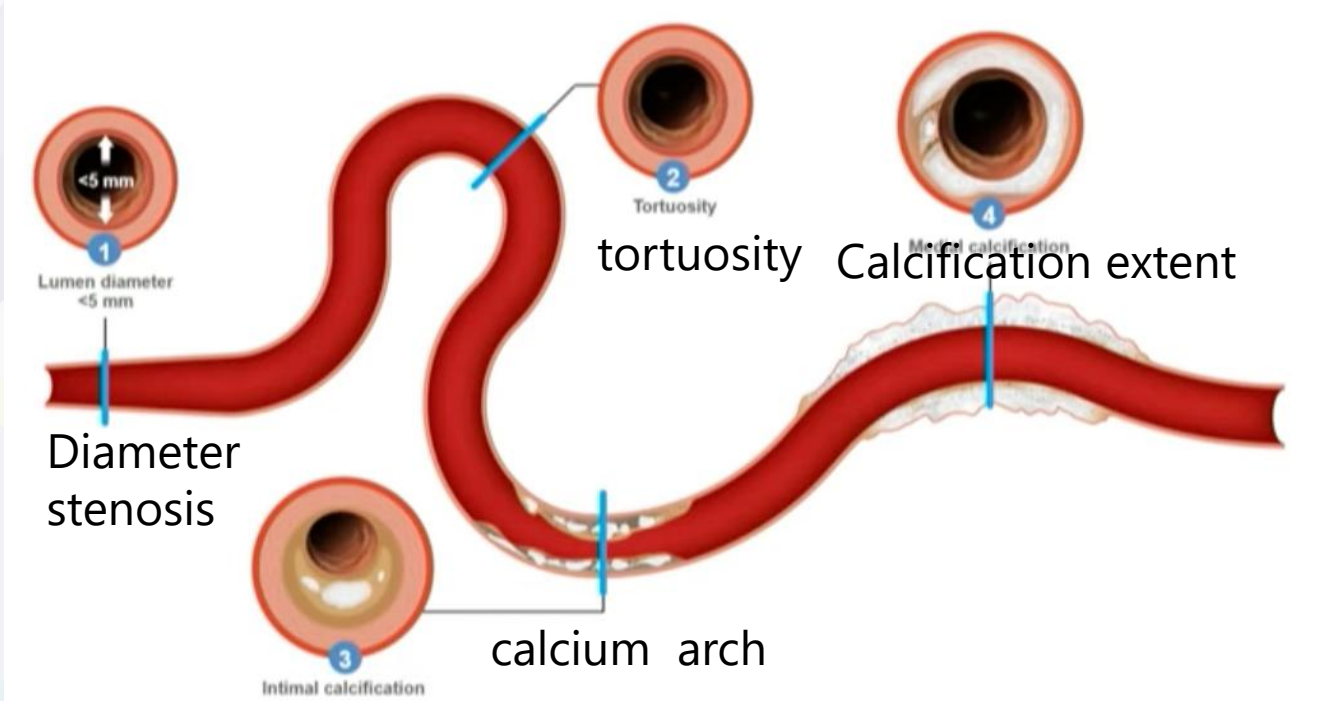
Angel Sánchez Recalde
Hospital Universitario Ramón y Cajal

What influences THV deliverability ?

The Copenhagen Experience



The more factors, the lower the chance of success …



Hostile environment – Assessment alternative access

- ***Prior endovascular stenting***
- ***Severely calcified iliac bifurcation with protruding calciu***
  the lumen
- ***Combination of calcification & tortuosity***

Sawaya et al. Frontiers Cardiovascular Medicine 2021

IVL

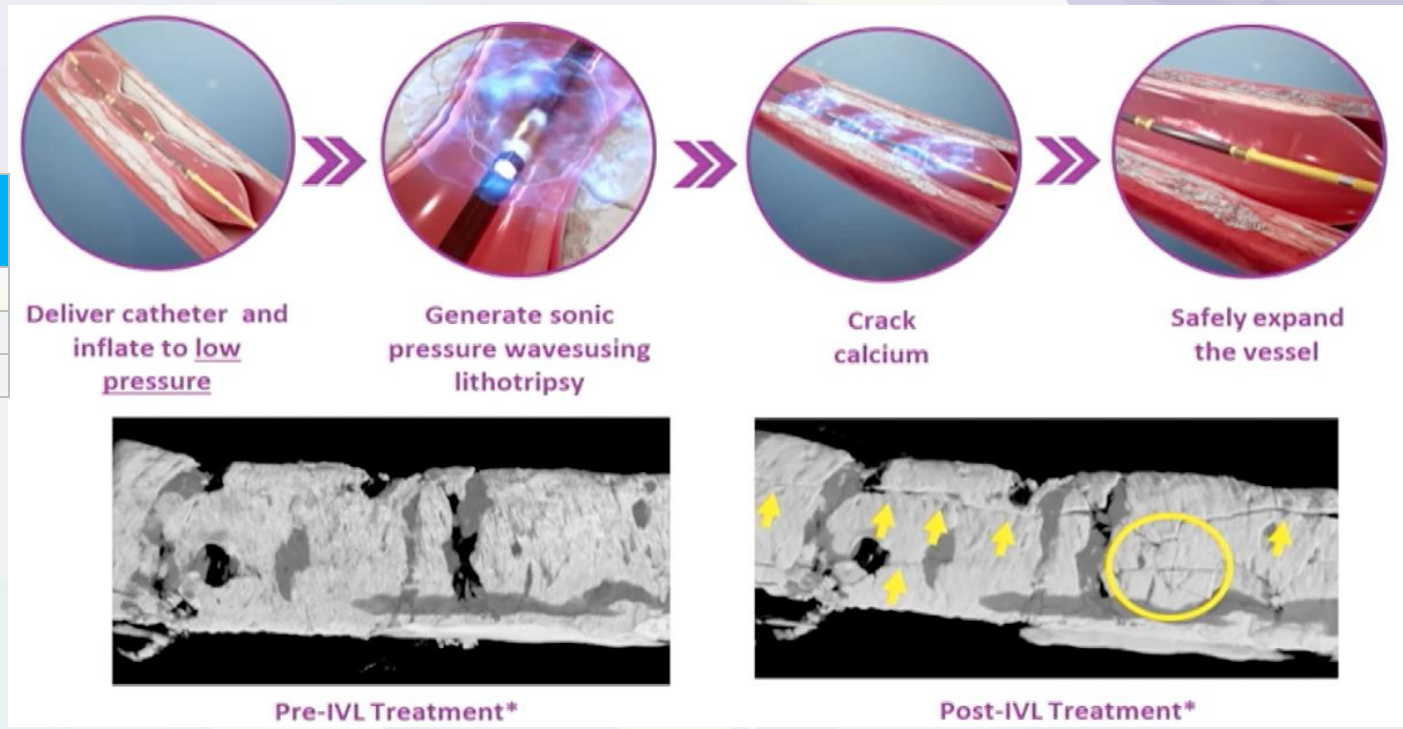
Peripheral IVL specifications

SHOCKWAVE | M5+

Balloon Diameter (mm)	Balloon Length (mm)	Guidewire Compatibility (in)	Sheath Compatibility	Catheter Working Length (cm)	Max Pulse Count	Pulses Per Second
3.5-6.0	60	0.014	6F	135	300	2
6.5-7.0	60	0.014	6F*	135	300	2
8.0	60	0.014	7F	135	300	2

*6F Compatible with Terumo Pinnacle® Destination® Guiding Sheath and Cook Flexor® Ansel Guiding Sheath.
Reference trademarks are trademarks of their respective owners or holders.

Mechanism of action



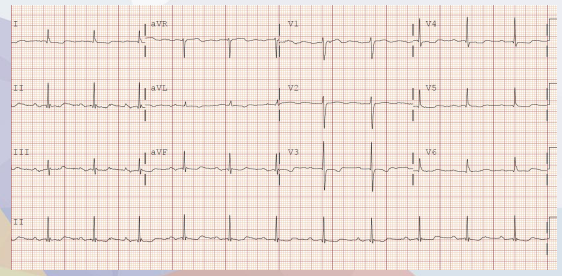
- *Each pulse delivers an effective pressure of 50 atm*
- *Balloon maintained at a low inflation pressure*
- *Fractures both superficial and deep calcium*
- *Increasing vascular compliance*

Clinical case

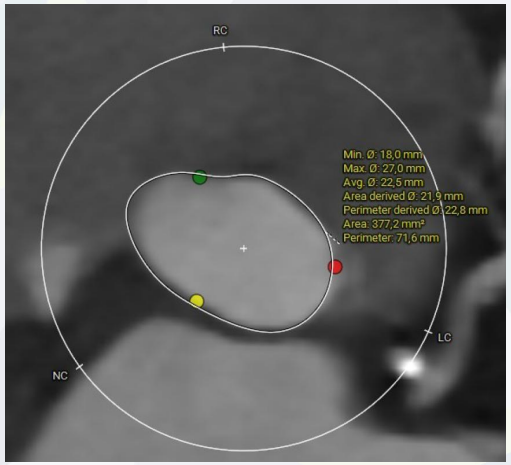
- 85 yo male
- Mild frailty
- NYHA 2/3

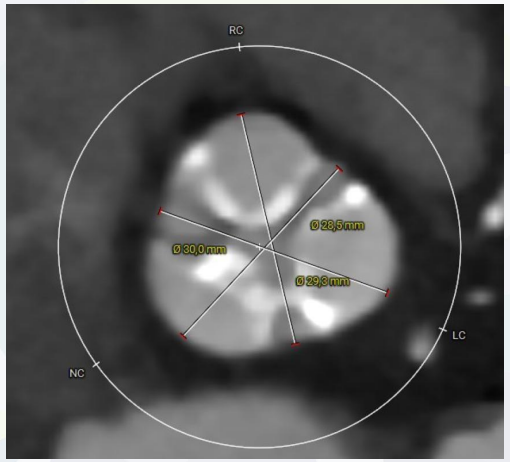
- EF 57%
- Severe AE (Max G 70 mmHg, AVA 0.80 cm2)

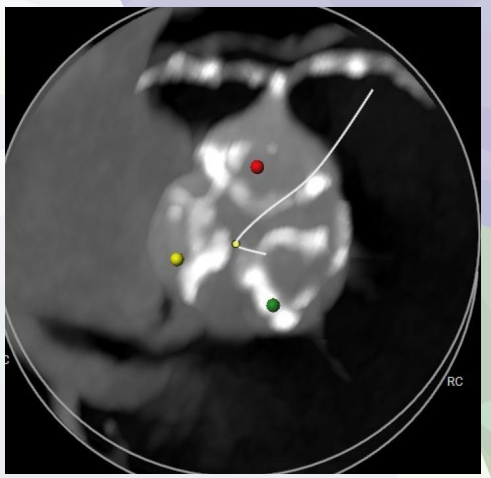
- Severe COPD
- Hypertension
- Ex-smoker

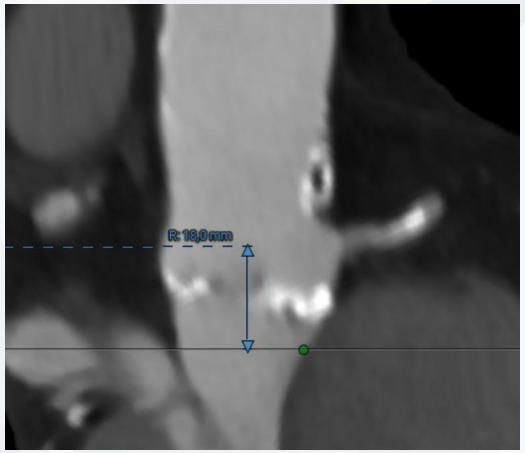


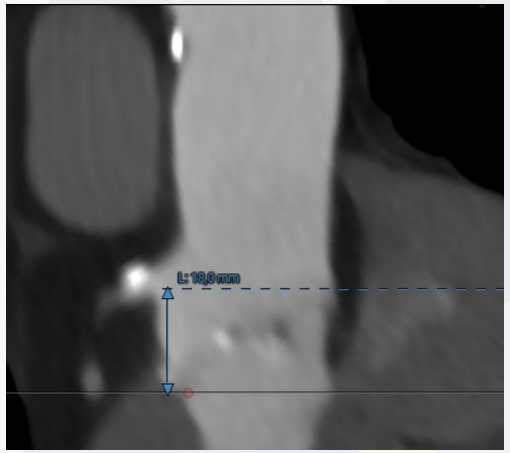
TAVI Planning

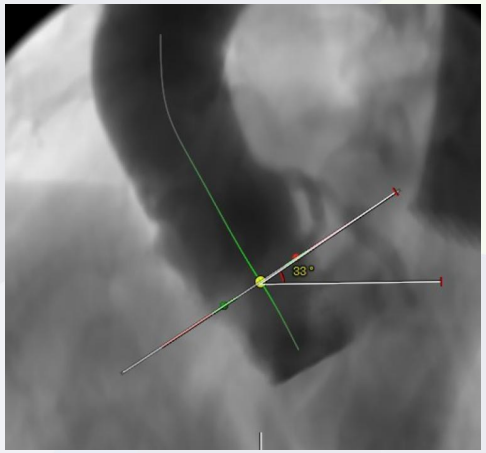




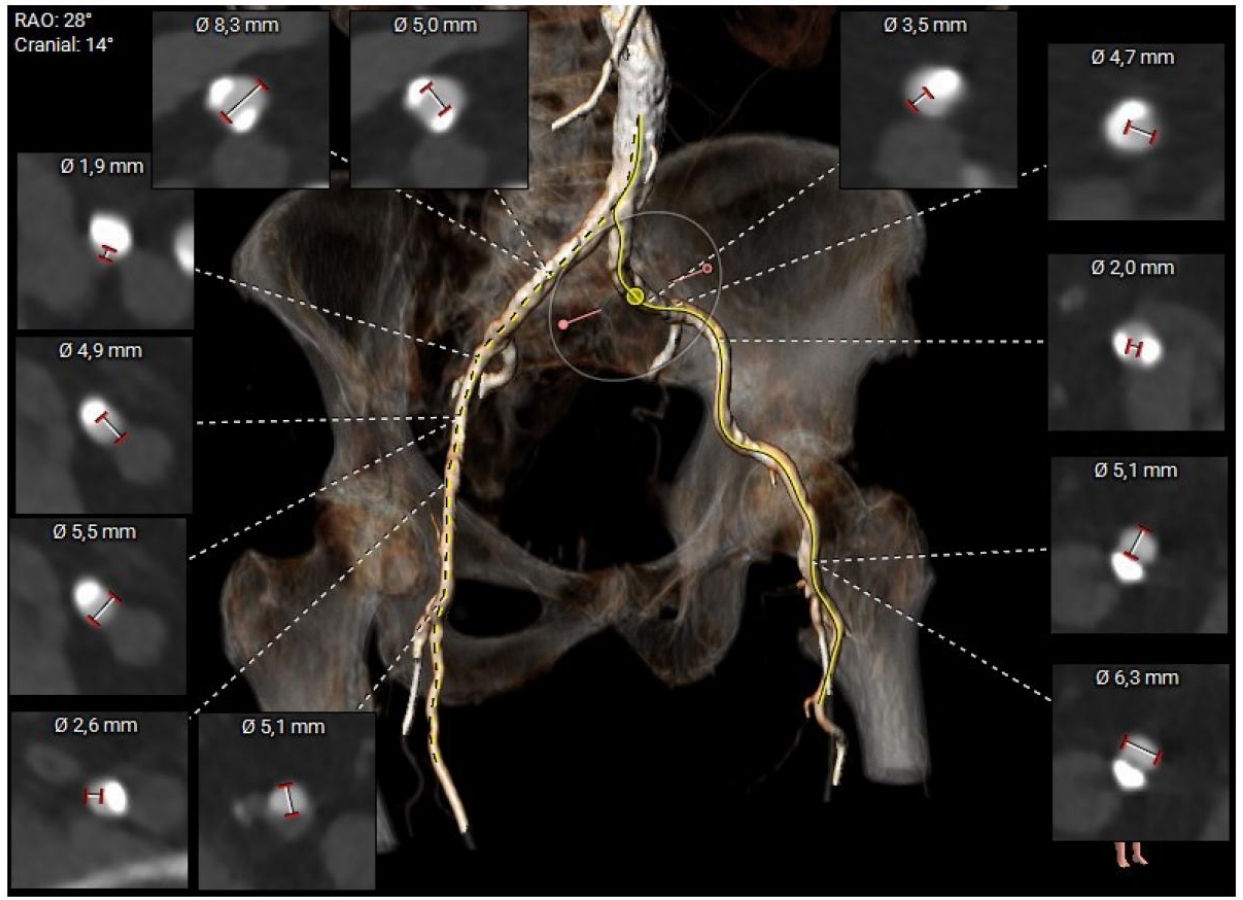


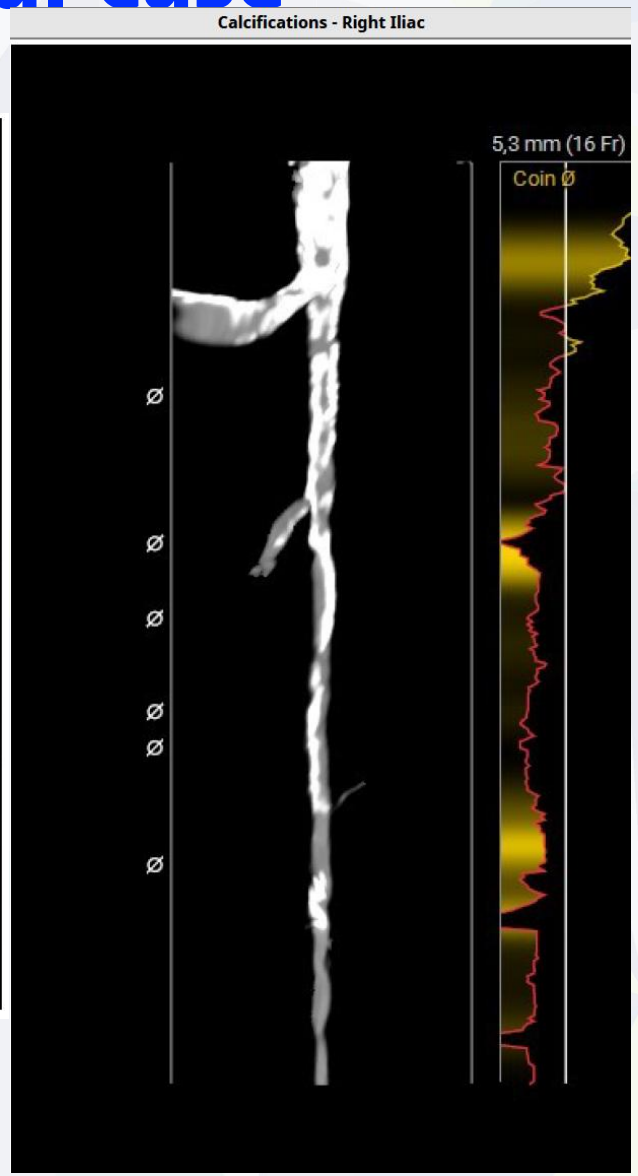


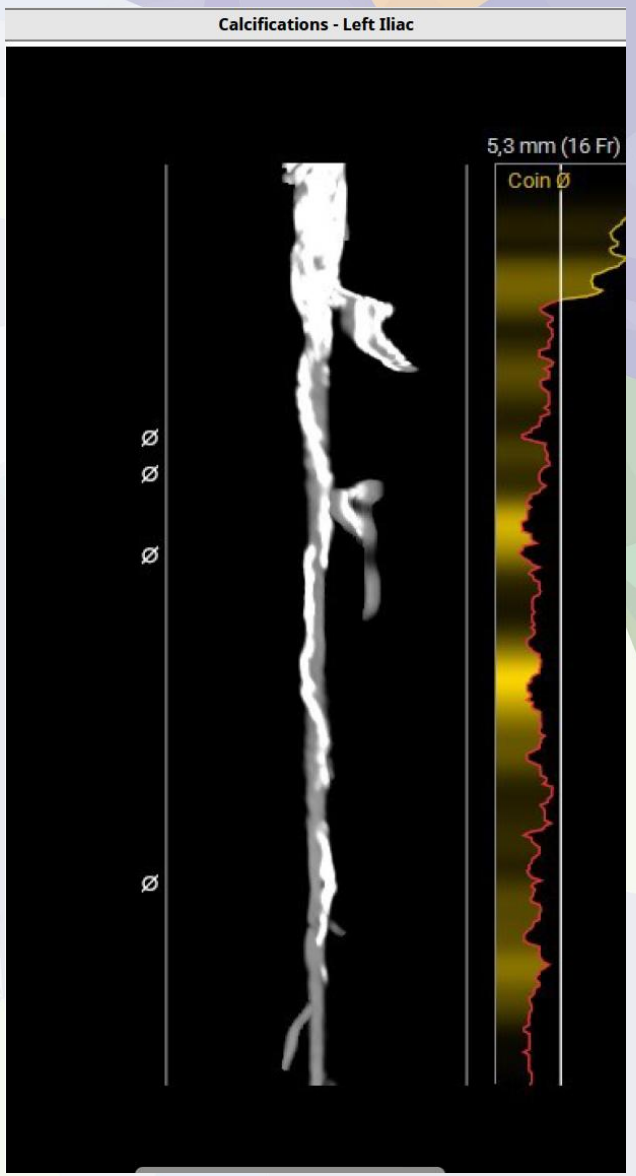




Clinical case







Calcifications
Tortuosity
Right & Left bifurcation

IVL Copenhagen recommendations

- Ilio-femoral artery size (>5.5 mm)
- Absence of heavily Ca iliofemoral arteries & along the aorta
- Absence of Severe/Rigid iliofemoral tortuosity
- <50% focal stenosis of ilio-femoral arteries
- Favorable access point

Yes → **Transfemoral TAVR Access**

No ↓

- Favorable access point
  - Localized Ca (< 20 mm length)
    - circumferential (360°) → MLD= 4 mm is recommended
    - non-circumferential (<360°) → MLD= 3 mm is recommended
  - Diffused Ca (>20 mm length)
    - circumferential (360°) → MLD= 4.5 mm is recommended
    - non-circumferential (<360°) → MLD= 3.5 mm is recommended

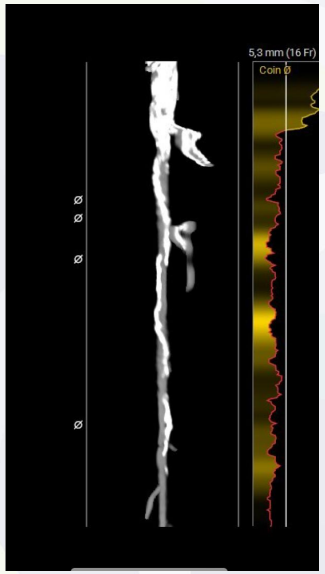
Yes → **Facilitated Transfemoral TAVR Access** *

No ↓

Based on Institutional Preference †

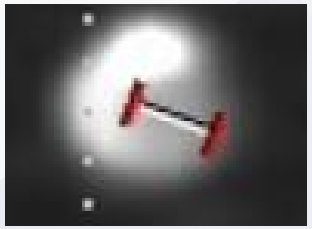
Heart Team

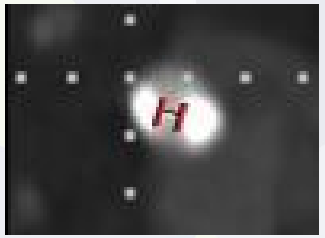
Tortuosity +



Extensive Ca

Ca < 360



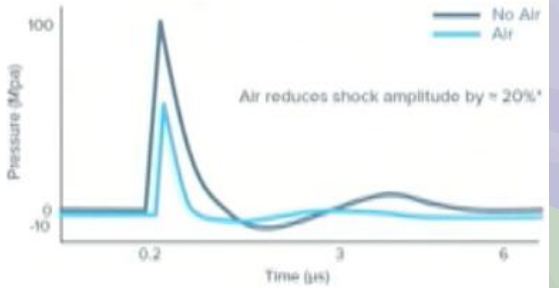


MLD 3 mm

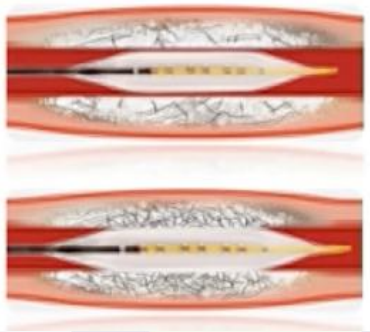
IVL-assisted TAVR - BEV

IVL Workflow

1. CATHETER PREP: purge air



1. SIZING: oversize device 100% to facilitate efficient transmission of sonic energy (7 mm – TAVI)



Undersized
Energy loss, associated with less fracturing

Well-Apposed
Efficient energy transfer, associated with more fracturing

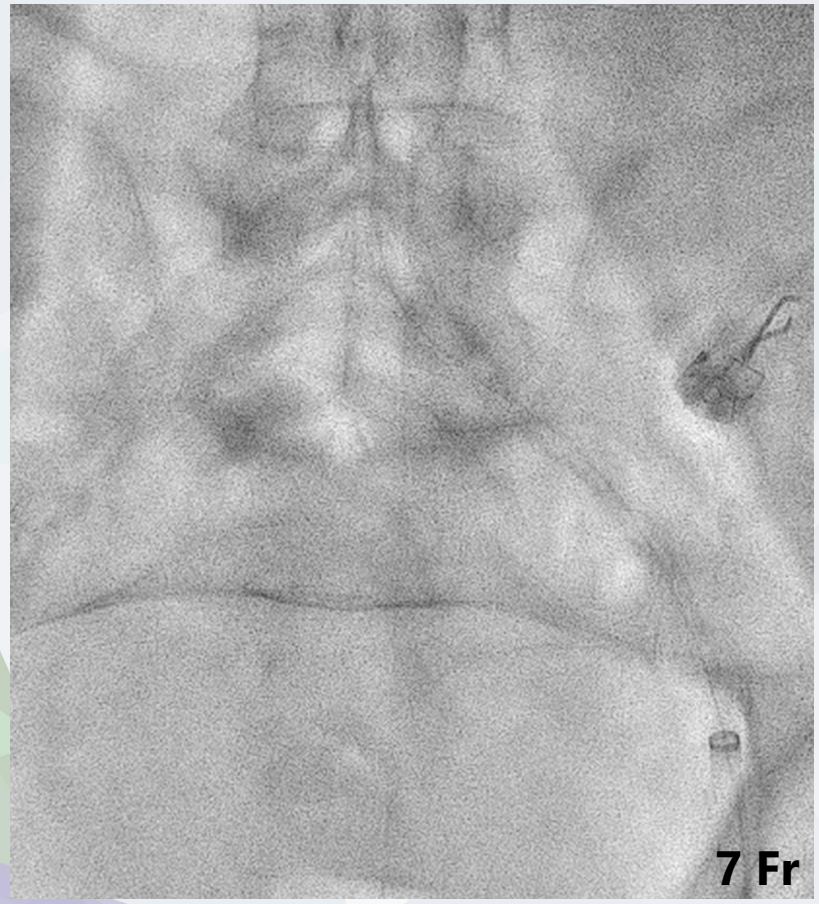
3. LOW PRESSURE THERAPY: up to 4 atm

Pulsing Pressure:
2-4 atm

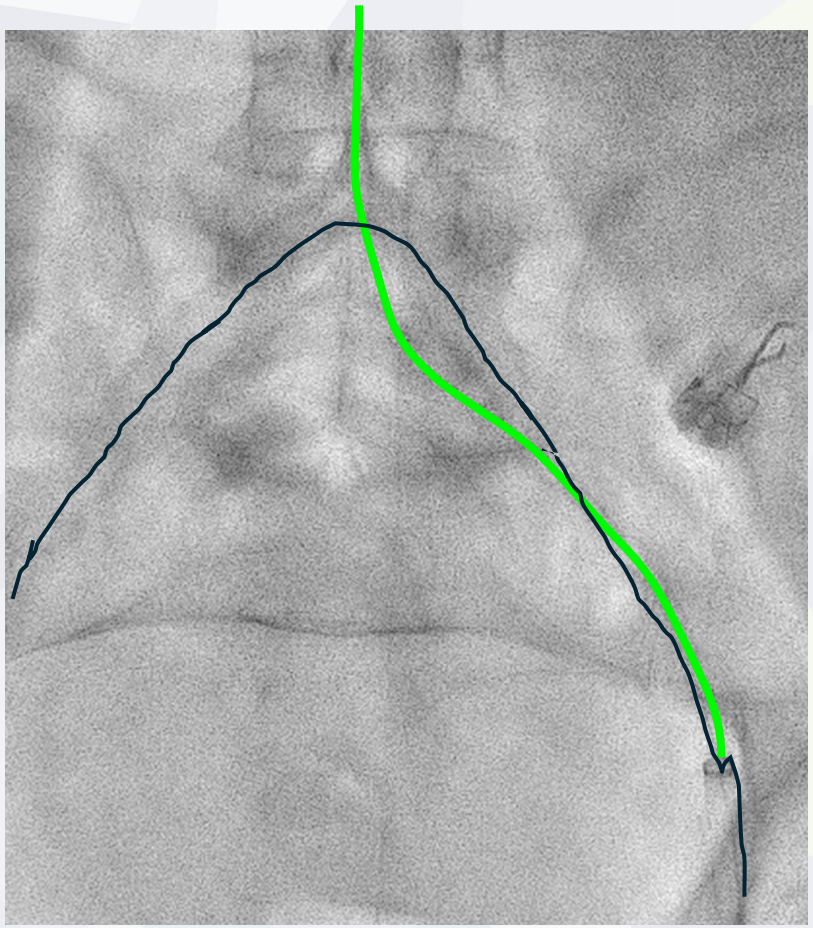
Nominal Pressure:
4 atm

Rated Burst Pressure:
6 atm

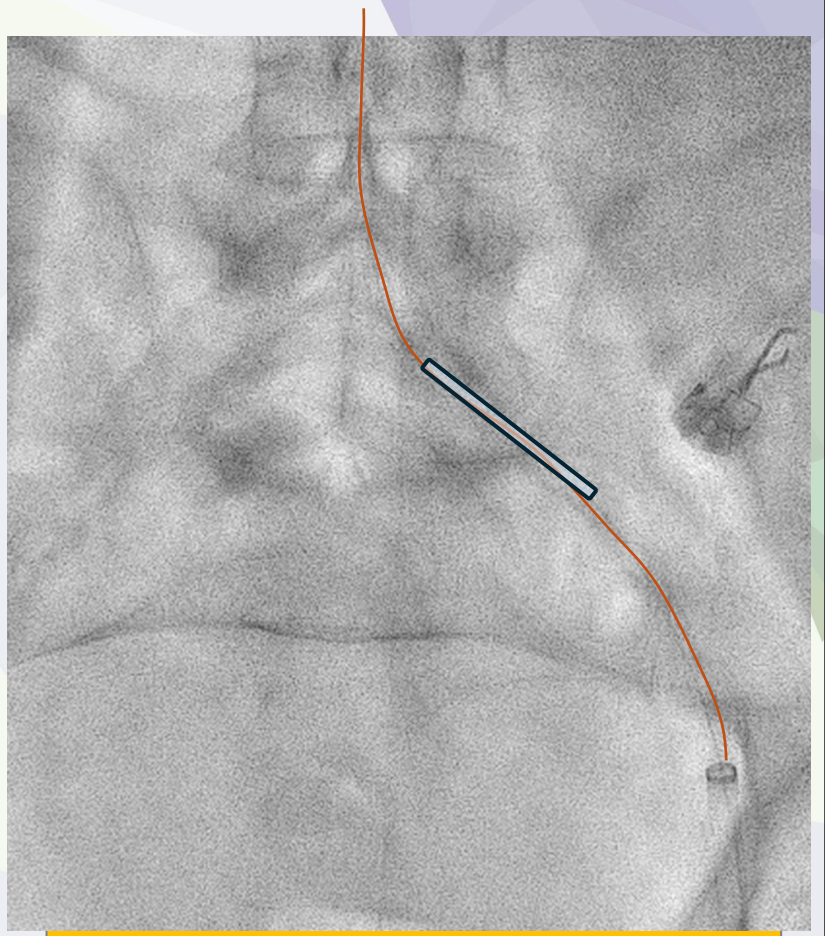
IVL Workflow



Extensive 'tramlining' on fluro



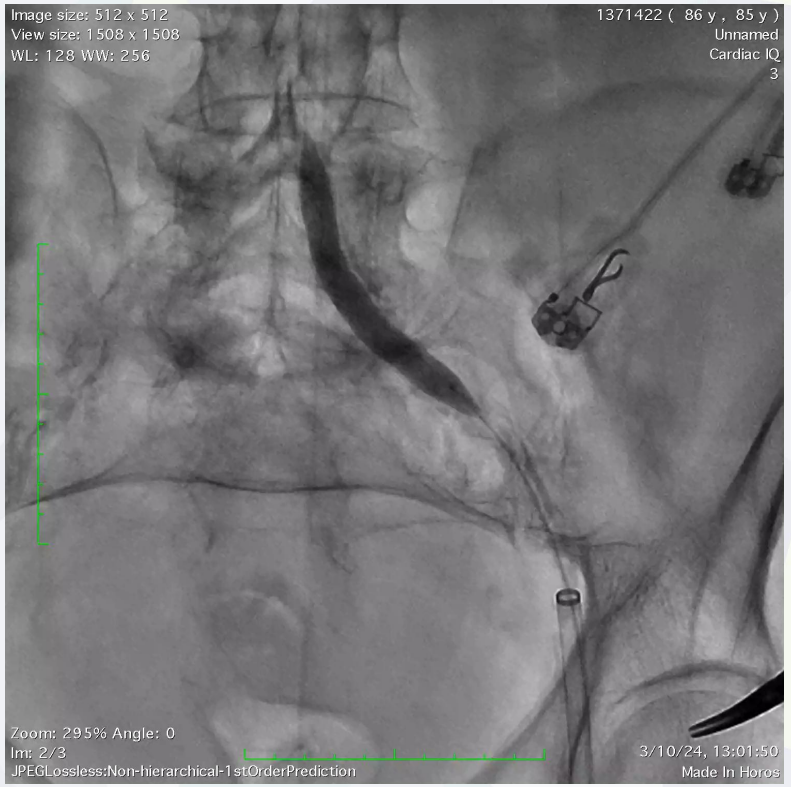
Antegrade exJ to annulus **(safety wire)?**
Contralateral proctection ?

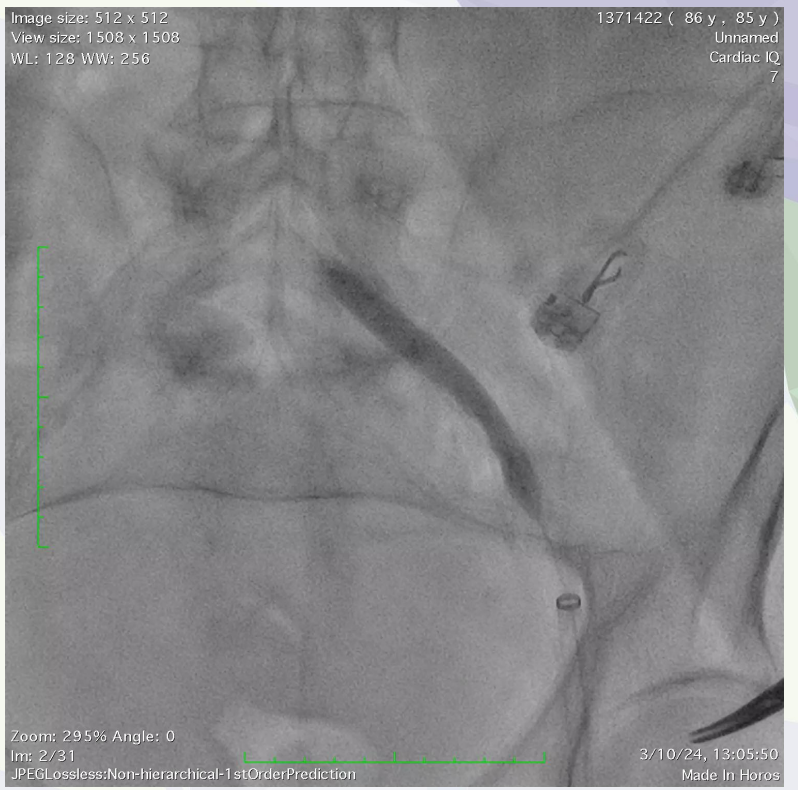


IVL 7mm (on coronary workhorse wire), adjacent to exJ safety wire

USS-guided CFA access → Proglide → Heparin → Long. Buddy wire / contralateral → IVL 7 mm in, treat liberally out

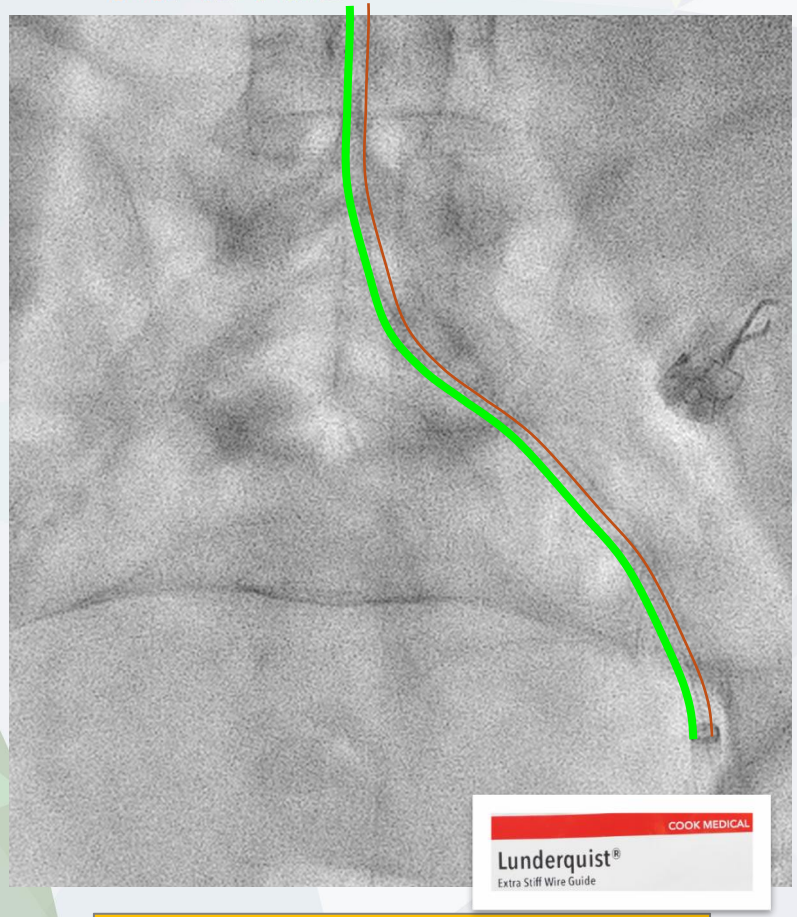
IVL Workflow





IM3 7 x 60 mm
30 pulses/cycle
Max 10 cycles

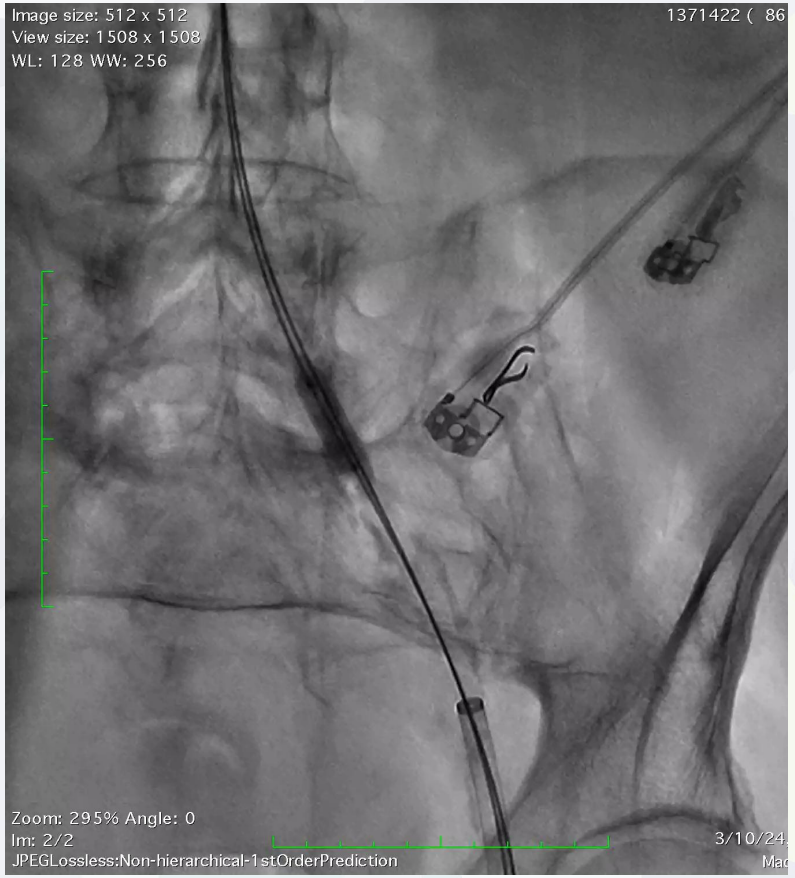
IVL Workflow



Rapid wire exchange for stiff wire for large bore access

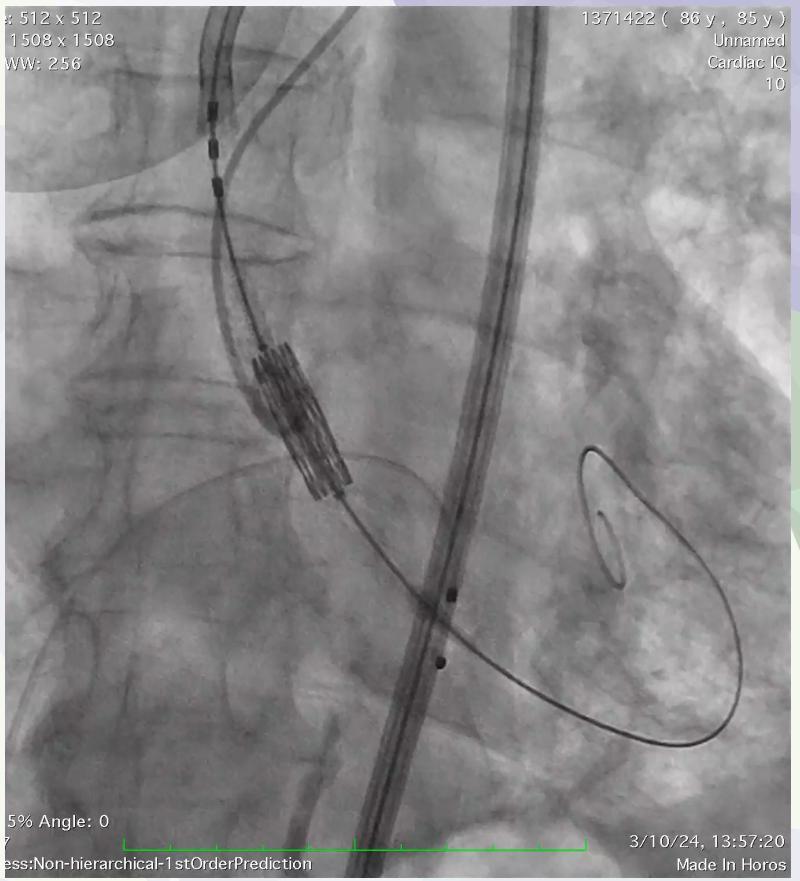
JR over long buddy wire

Lunderquist/stiff through JR



Prepare vessel: ballon vs dilator

Dilate

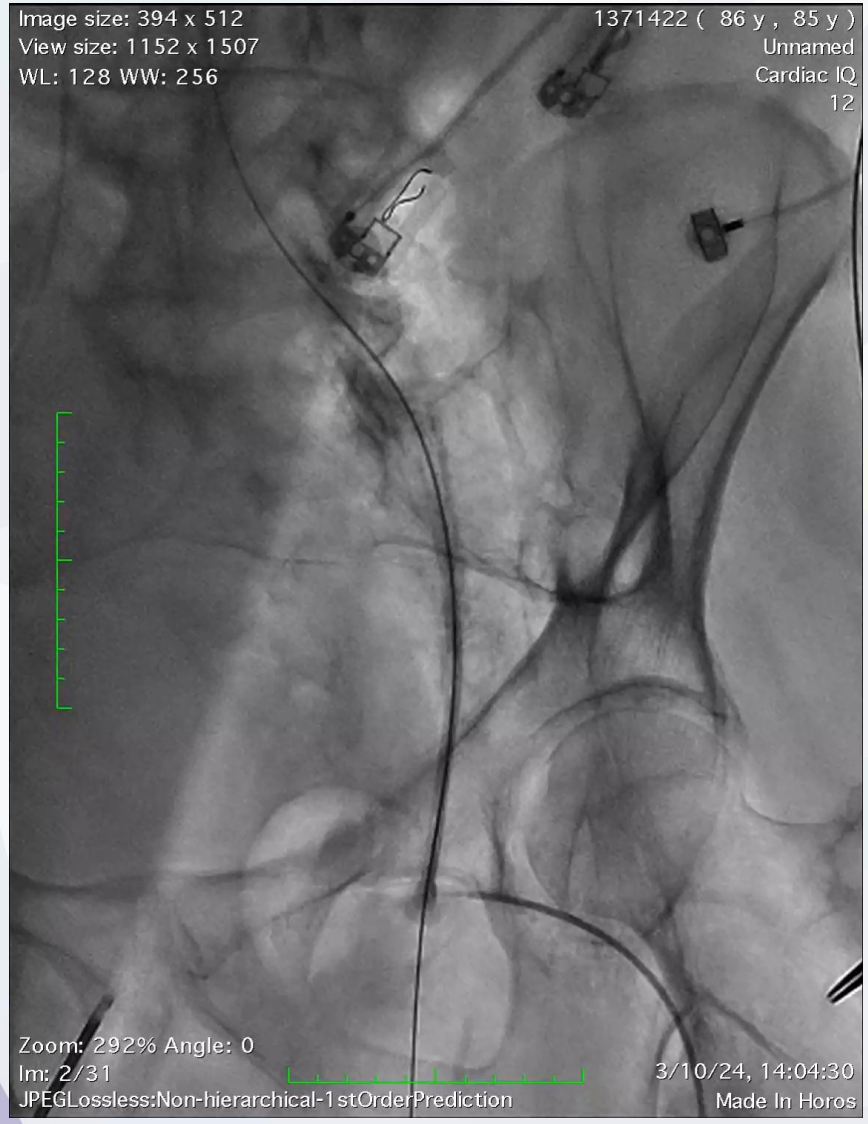


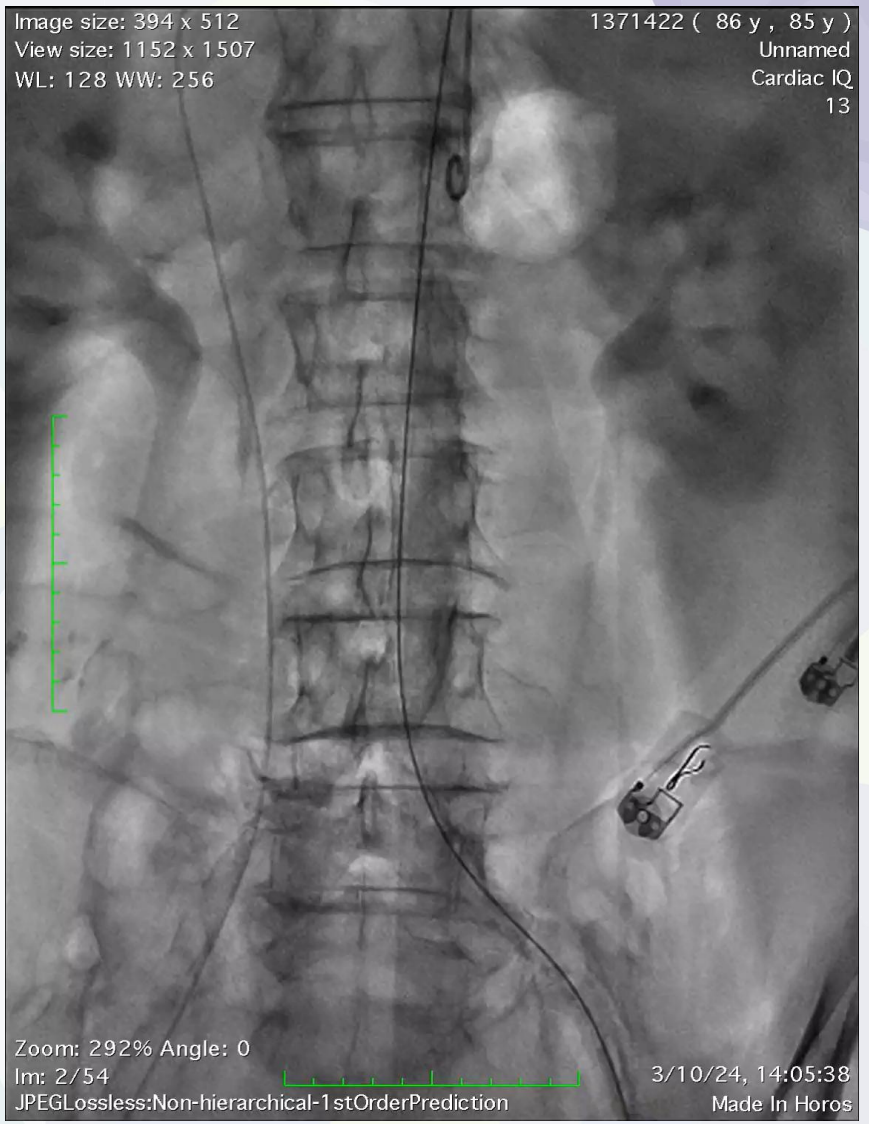
Propofol (lipophilic) coating to exterior of sheath to reduce friction

Propofol coating

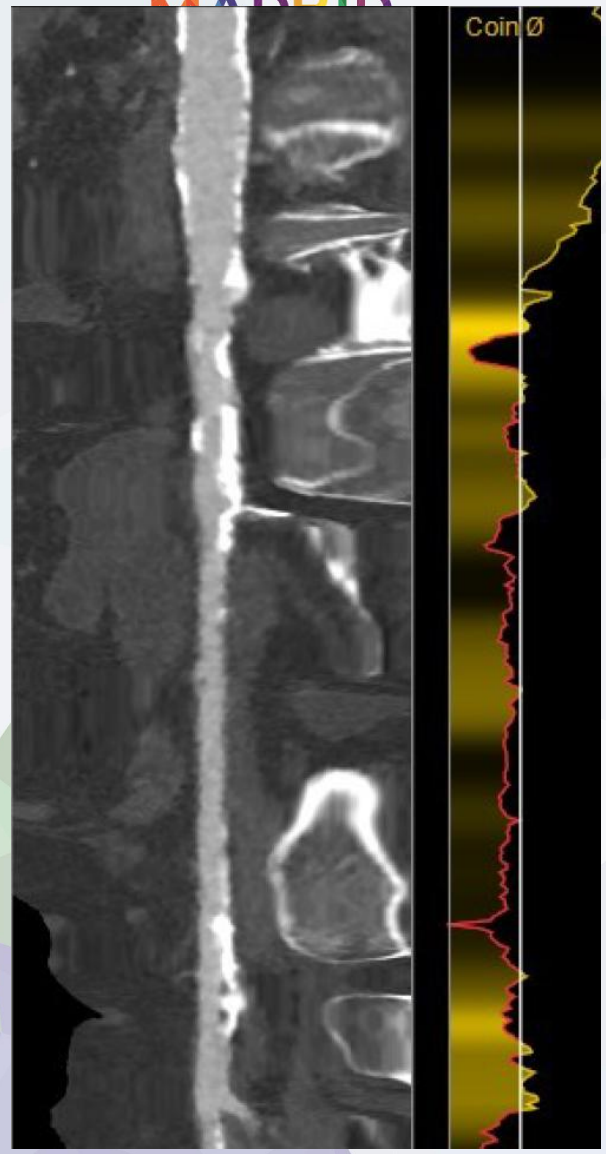
Sheath insertion

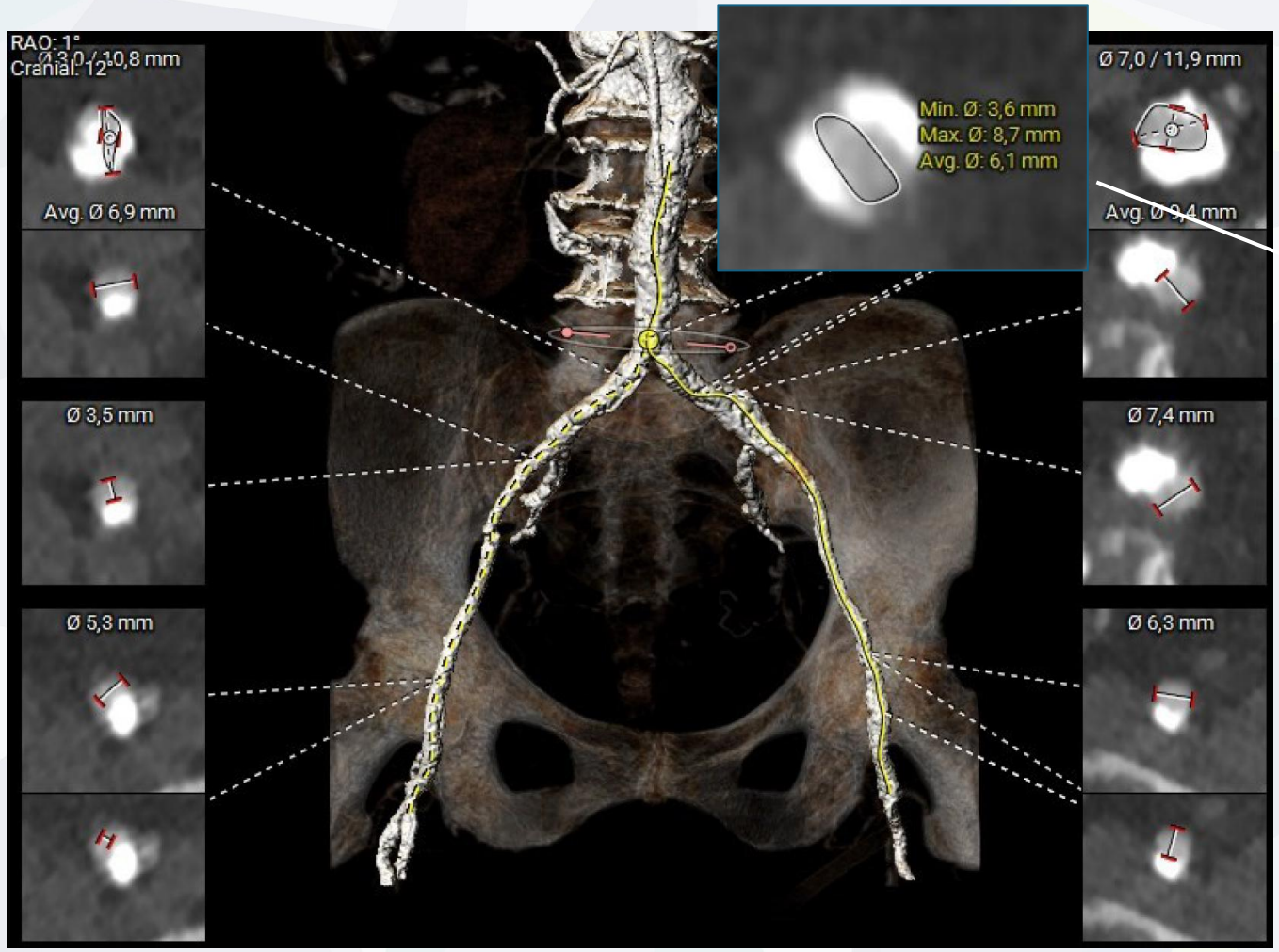
IVL Workflow

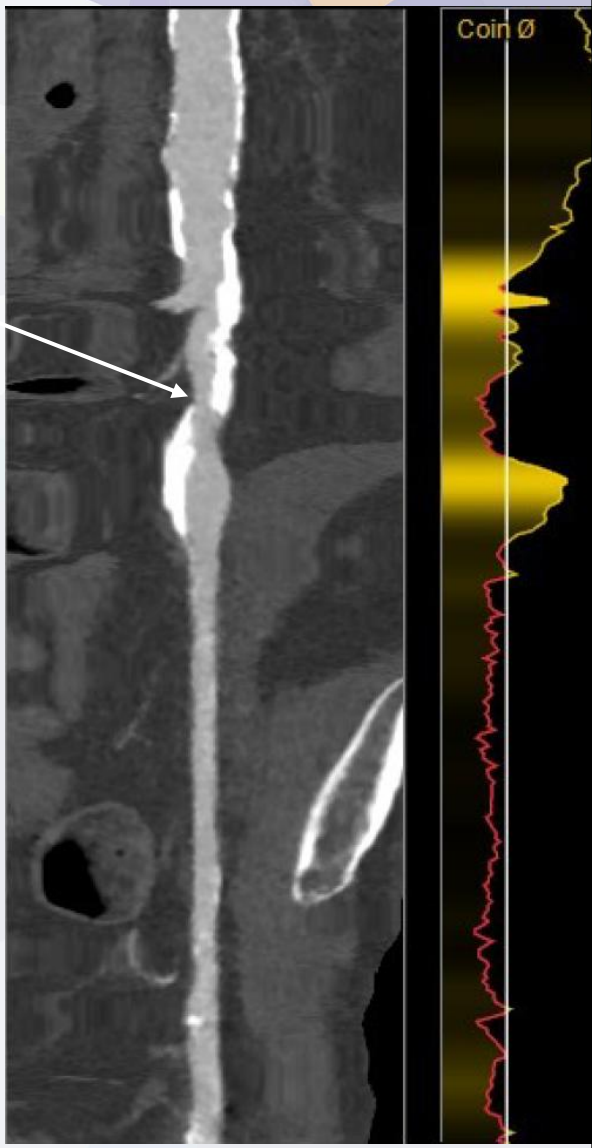




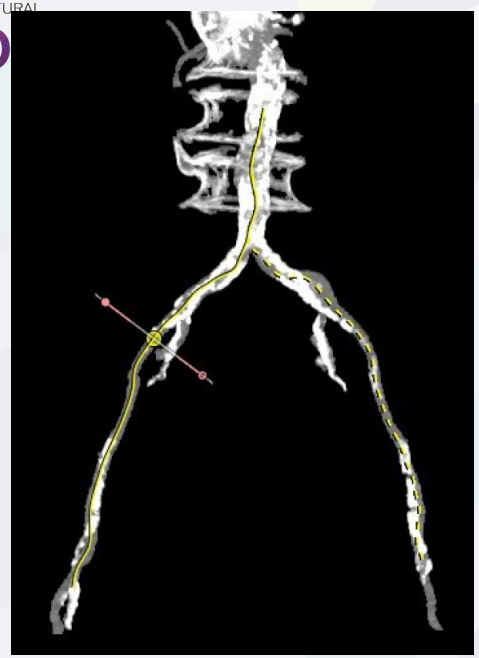
Clinical case



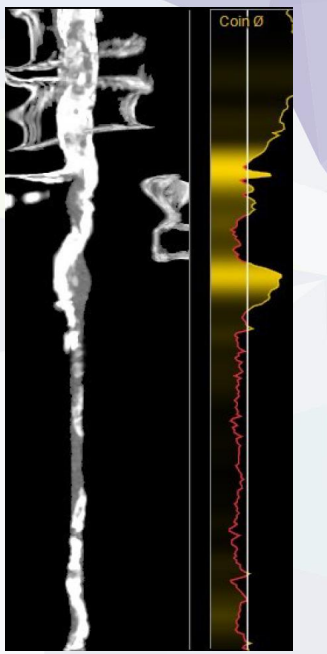




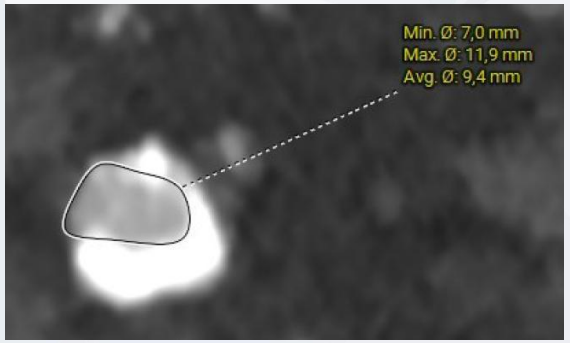
Heart Team



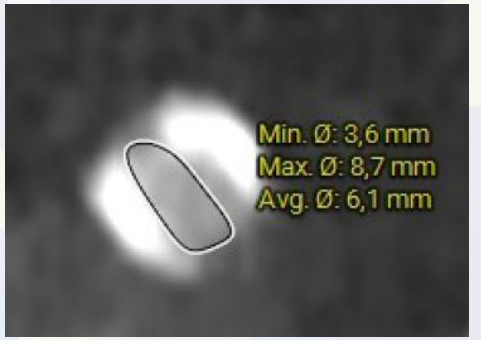
Tortuosity



Extensive Ca



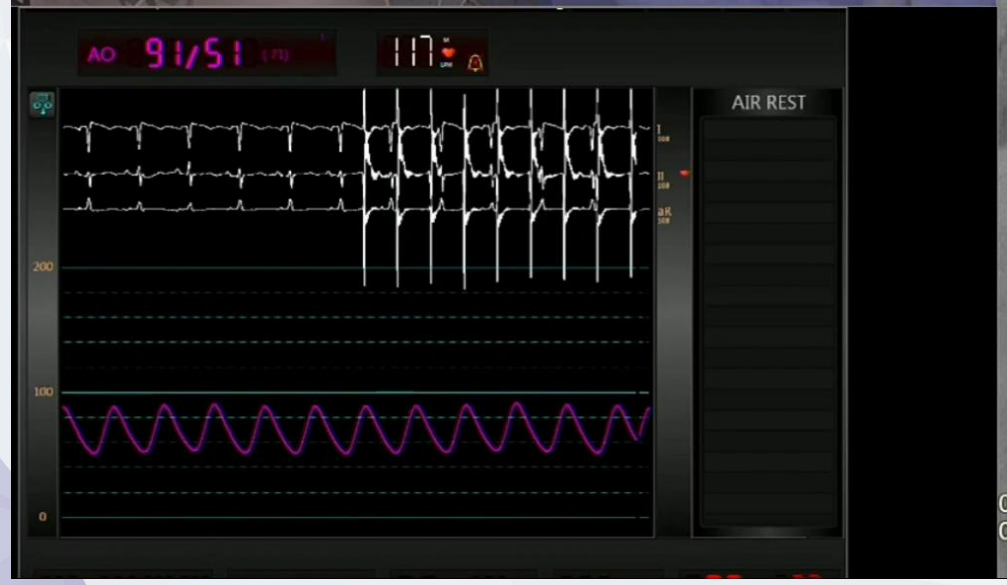
Ca < 360

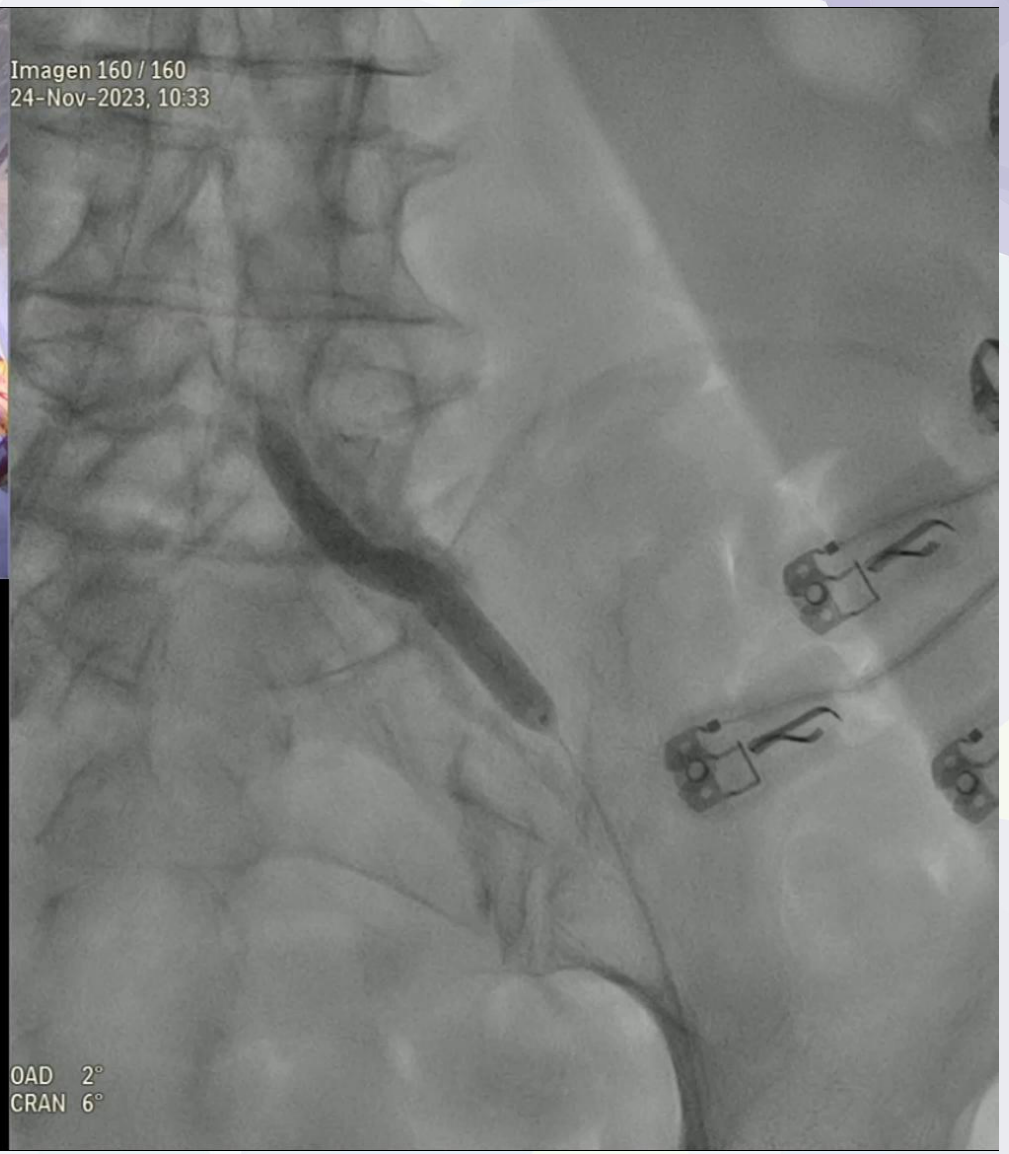


MLD 3,6 mm

IVL-assisted TAVR – SEV (Navitor)

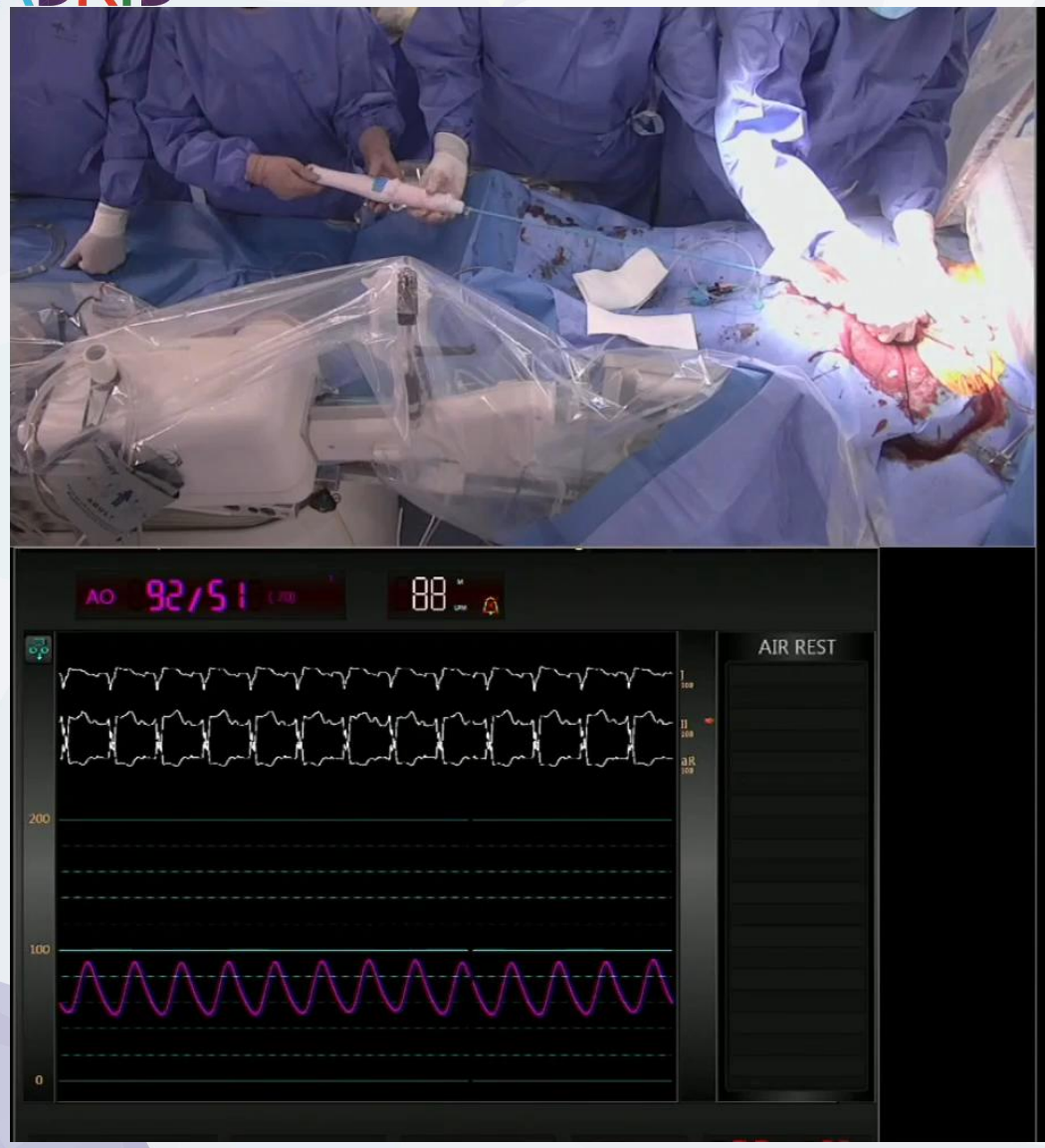
Clinical case

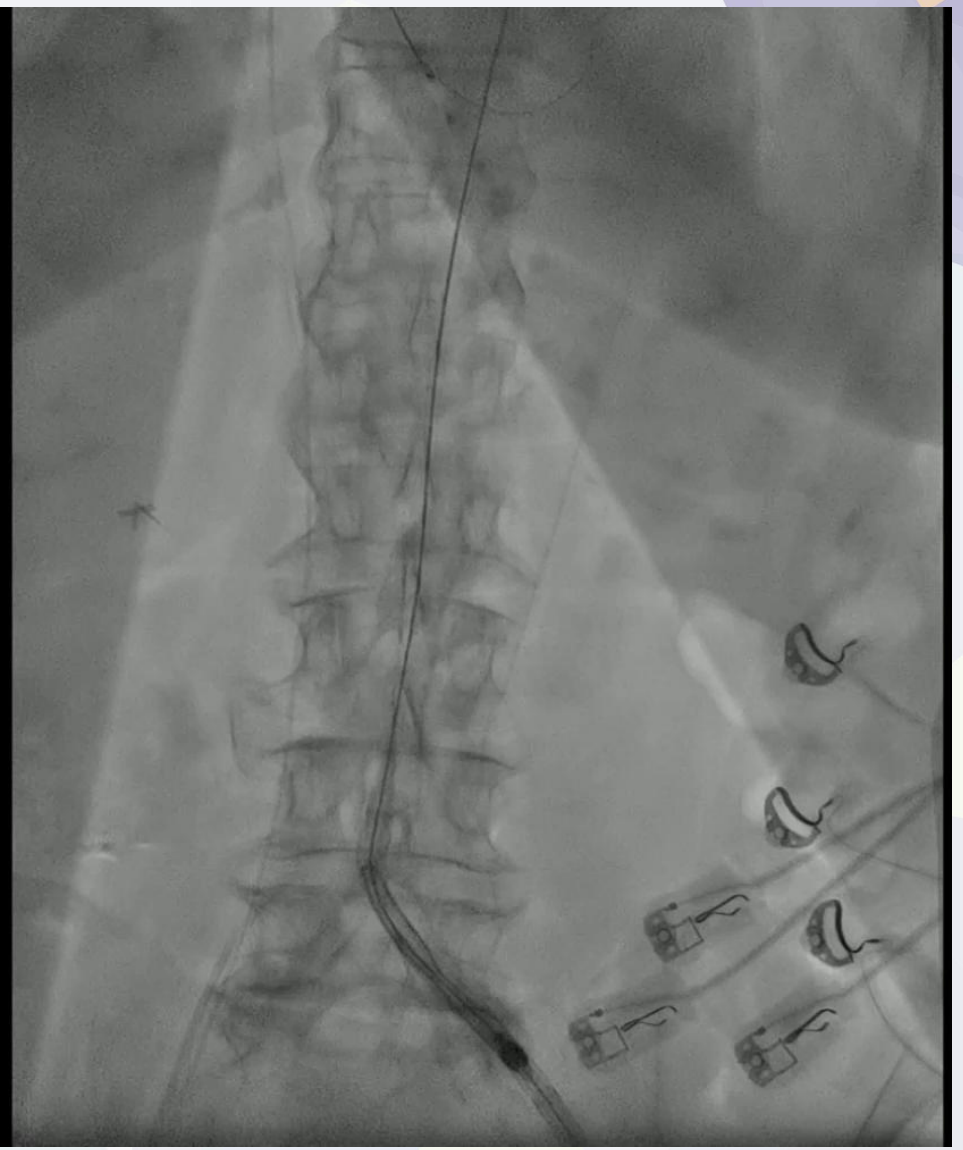




IVL 7 x 60 mm – 300 pulses

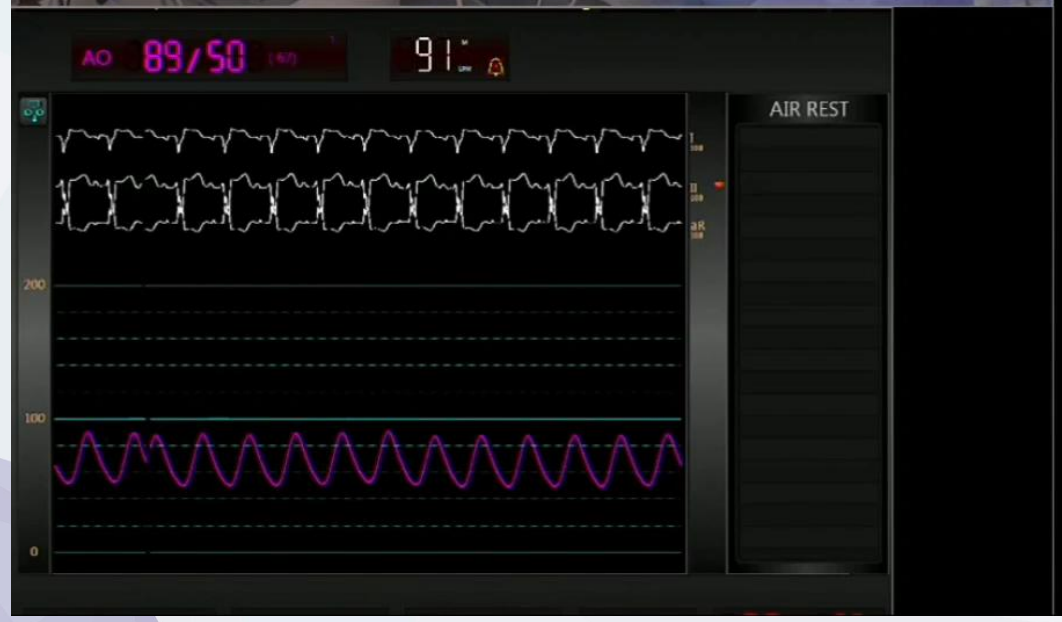
Clinical case

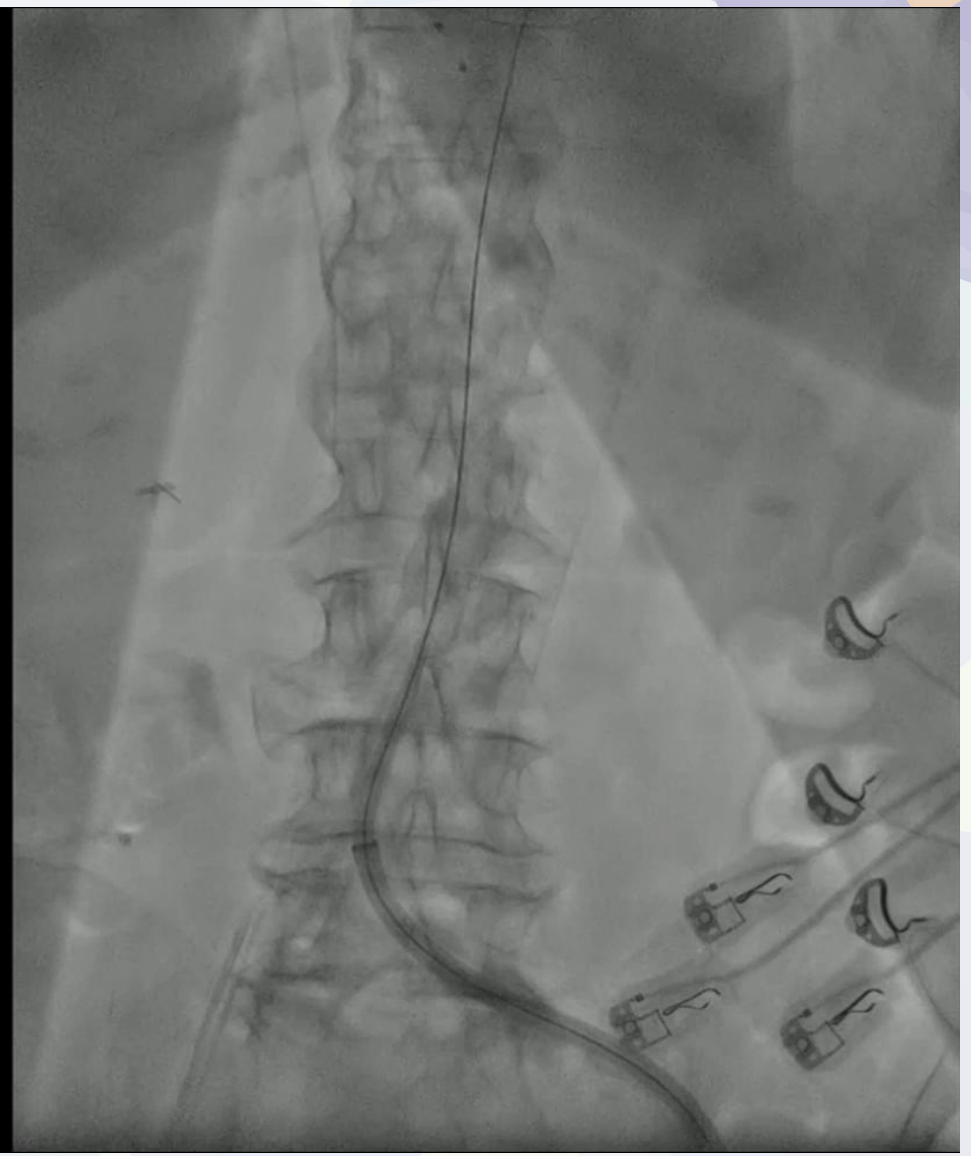




Navitor vision
27

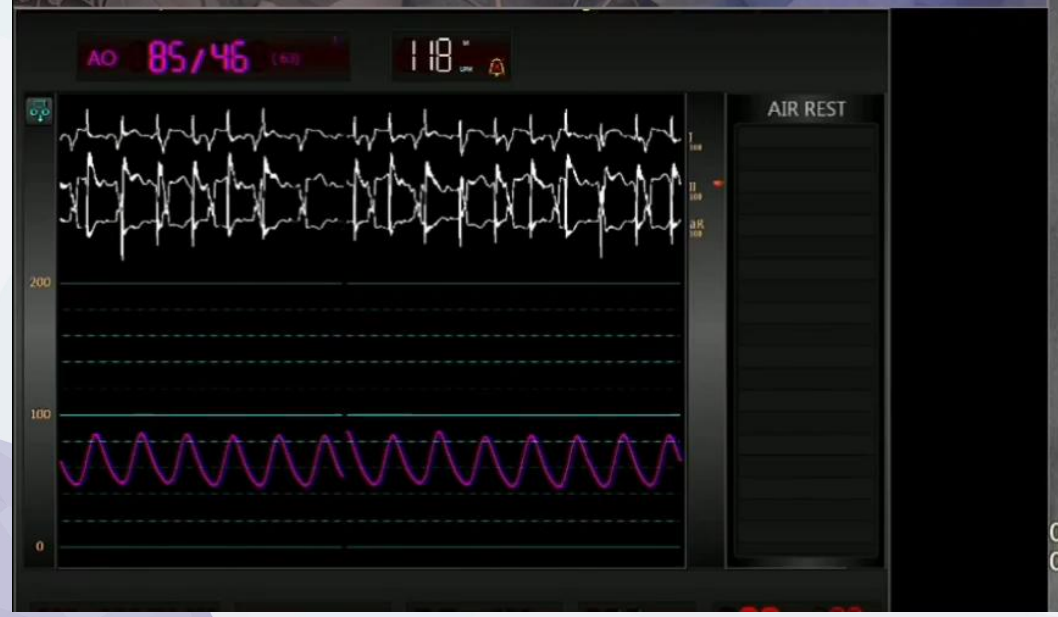
Clinical case

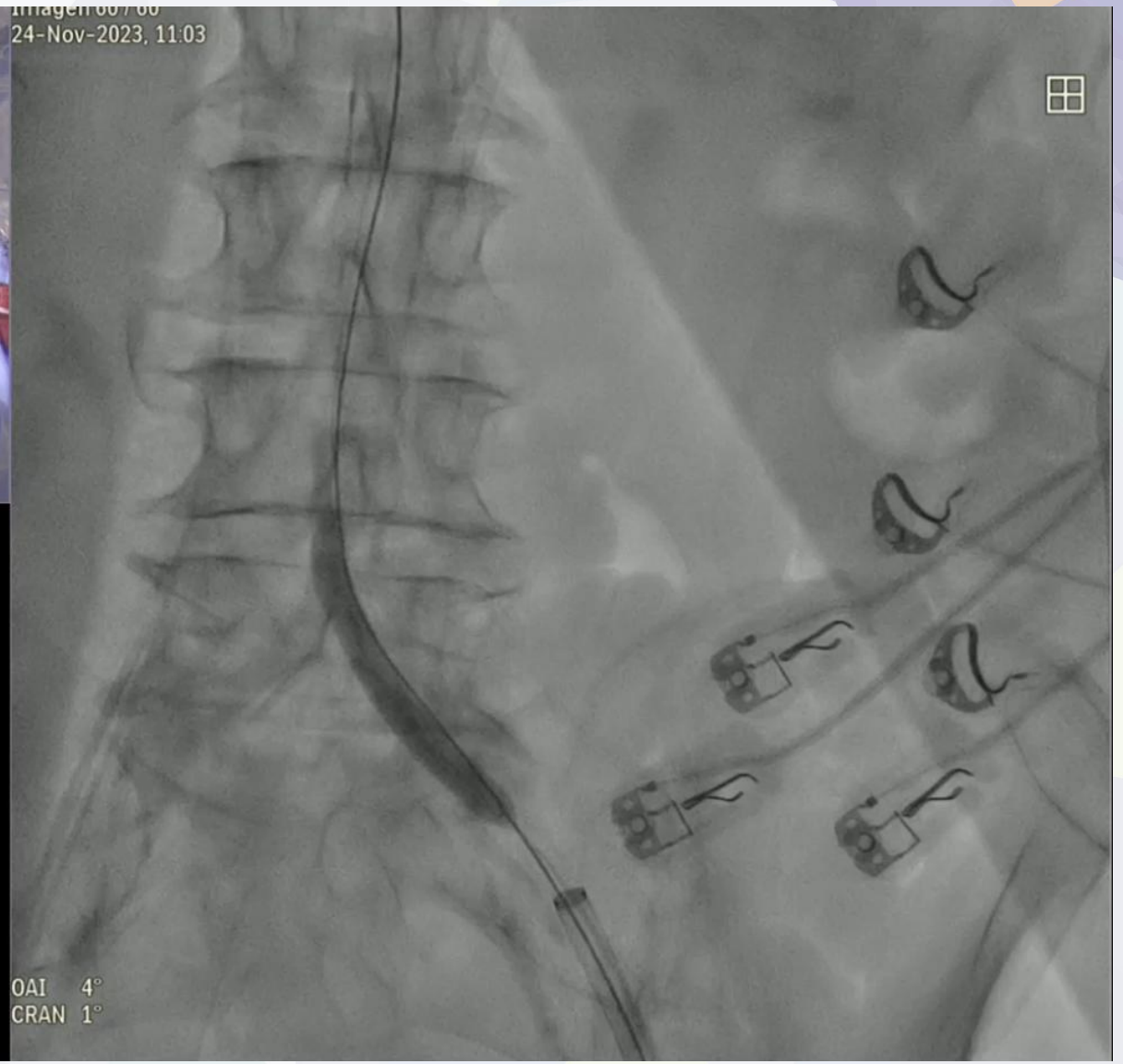




DrySeal 20 Fr

Clinical case



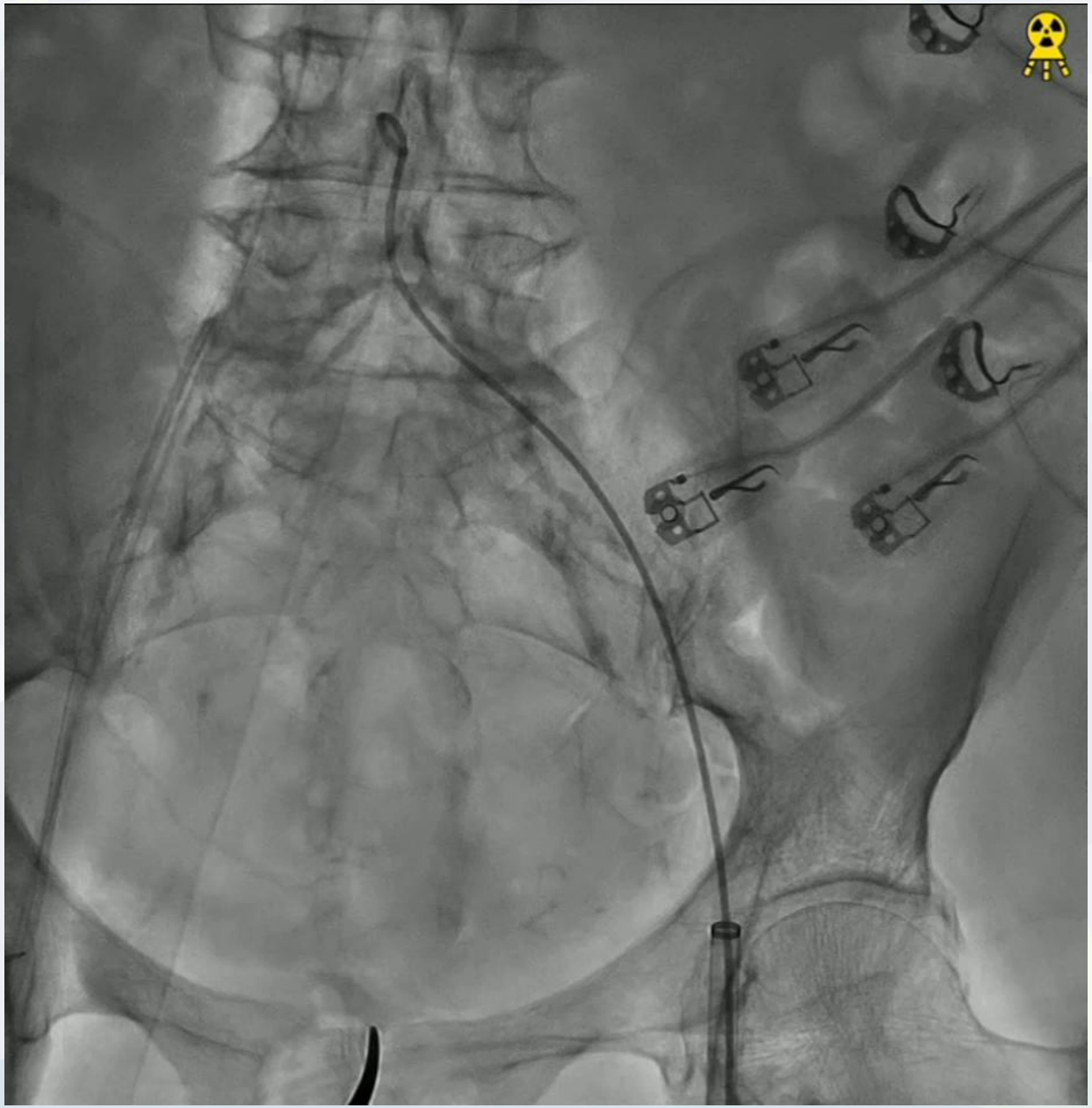


IVL 8 x 60 mm – 300 pulsos

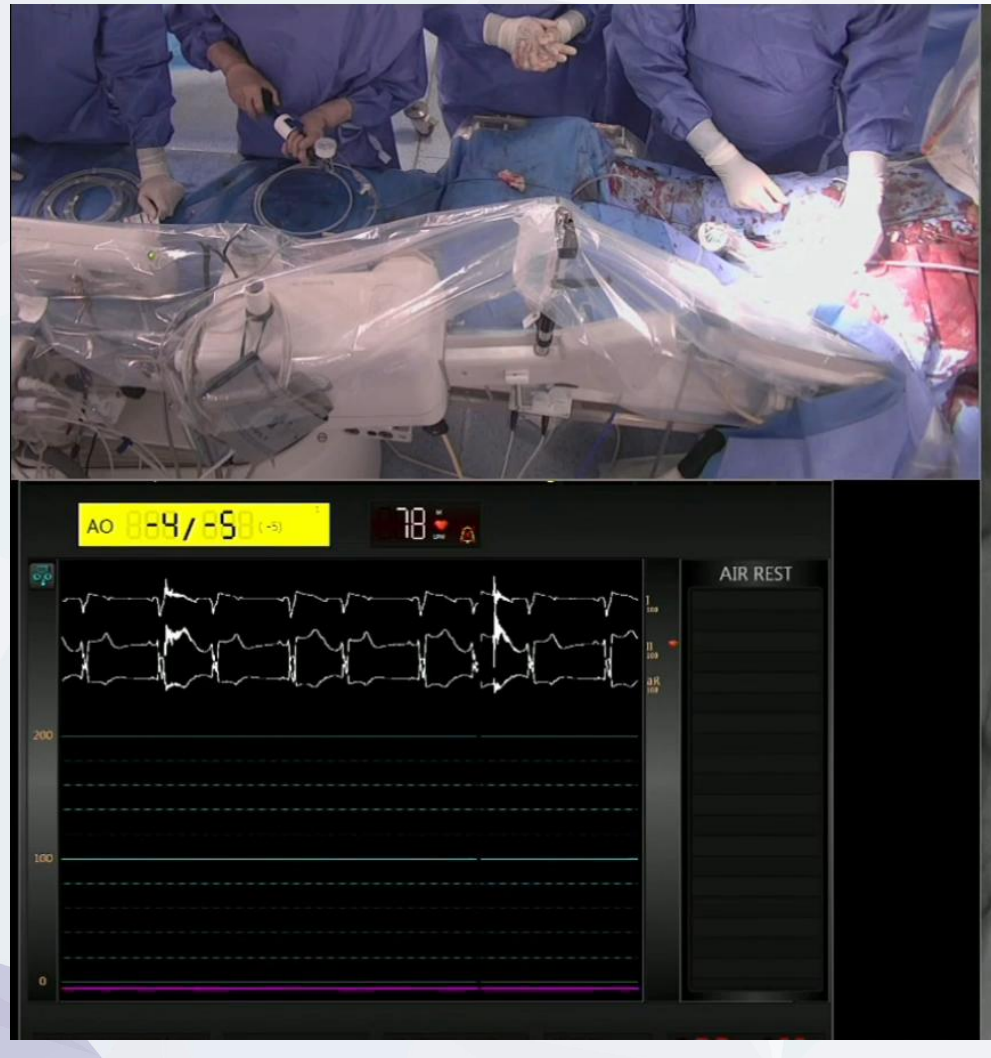
Clinical case

Navitor vision
27

Clinical case

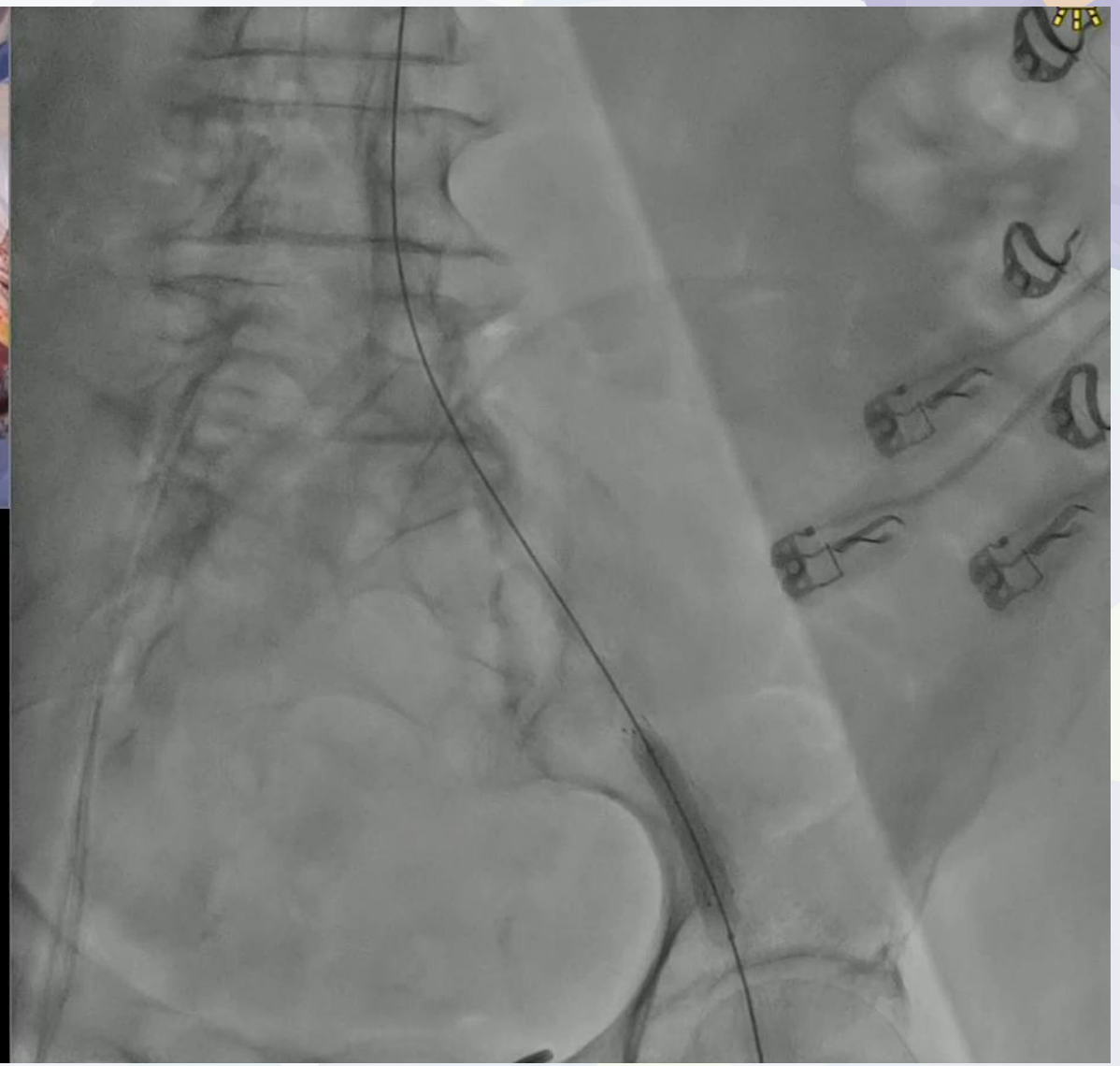


Clinical case



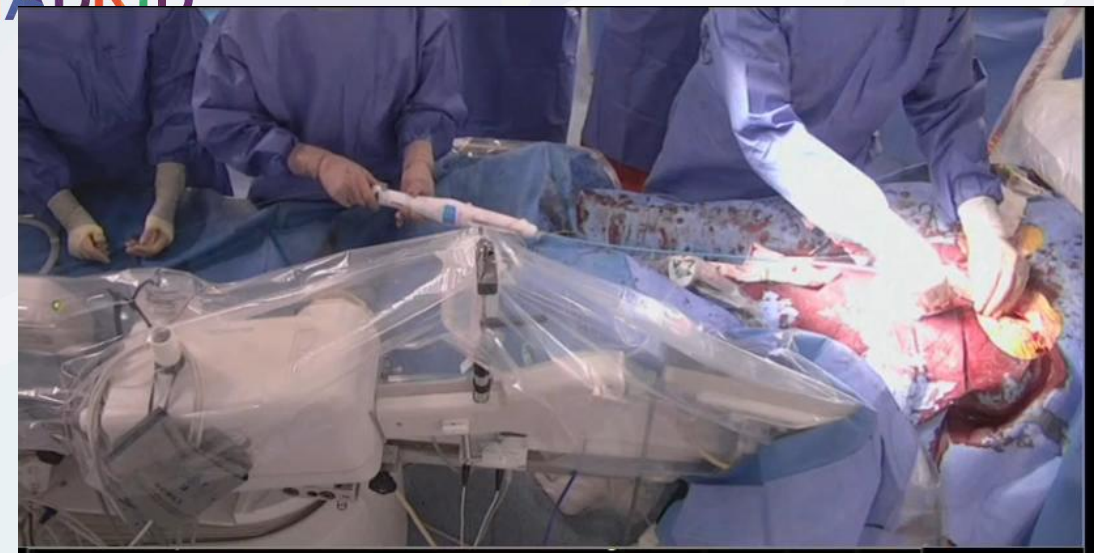
Stent Icover 7 x 57 mm

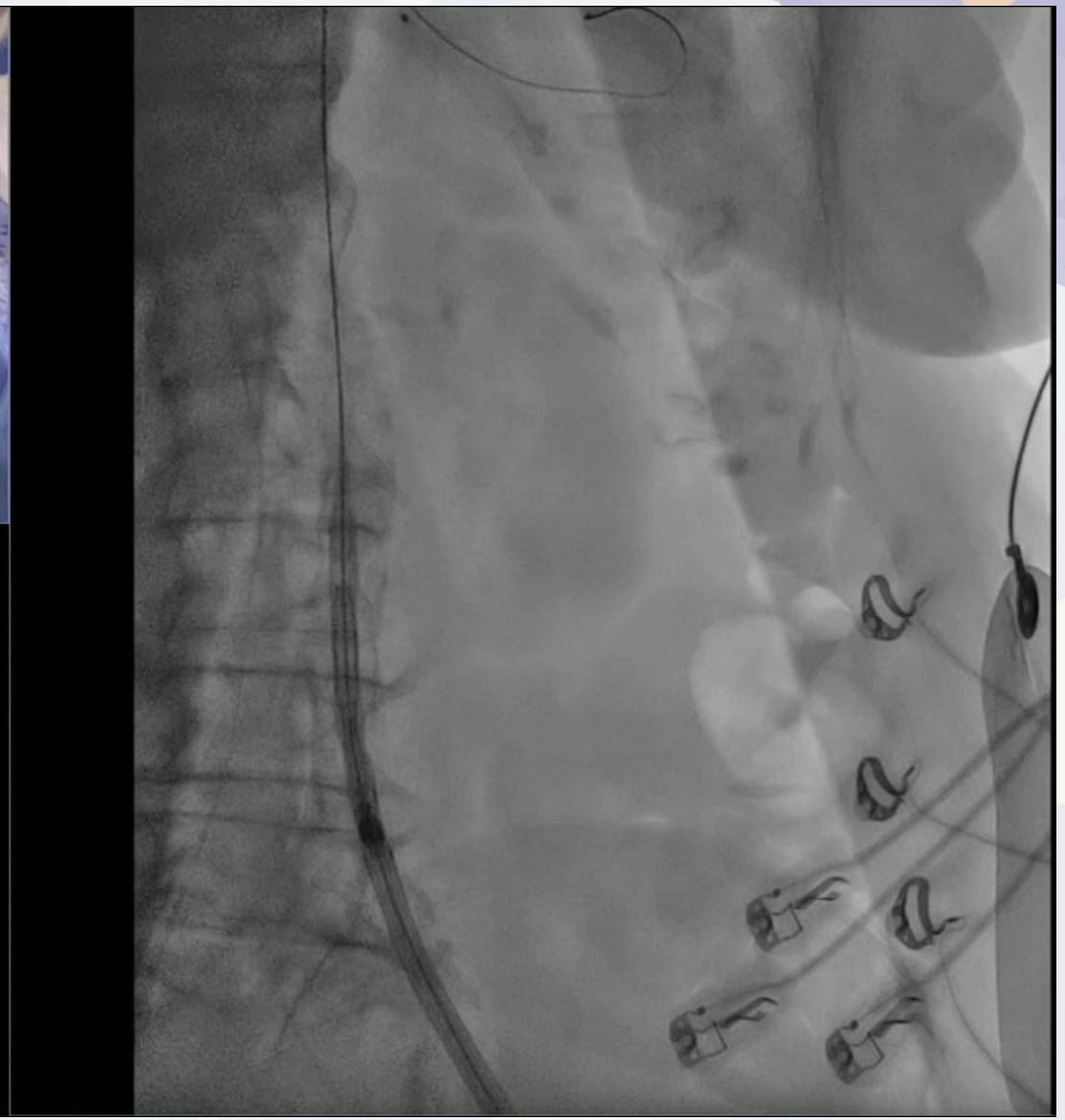
Clinical case



Balón Evercross 8 x 40 mm

Clinical case





Navitor vision
27

IVL assisted TAVI outcomes

Intravascular Lithotripsy-Assisted Transfemoral TAVR in the U.S. (Oct 2020-Nov 2023)

A Study Flow

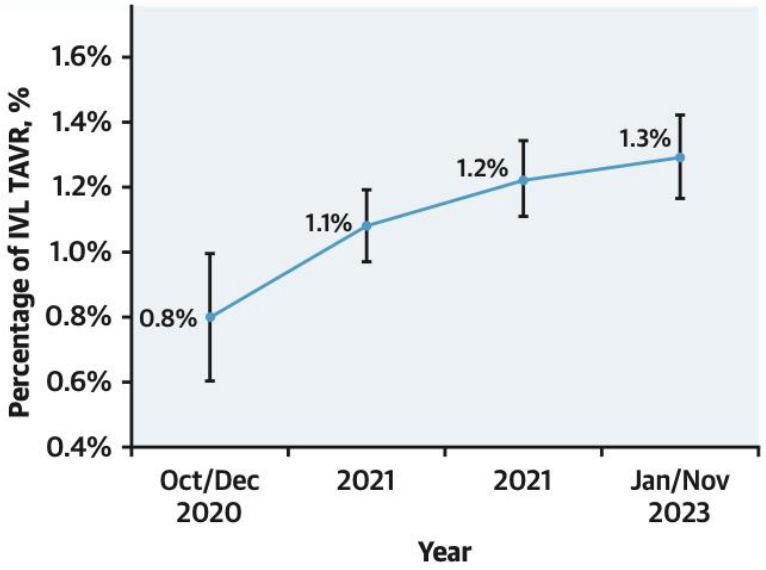
129,655 patients underwent percutaneous TAVR

- Non-IVL TAVR (n = 128,413) No. of hospitals = 361
- IVL TAVR (n = 1,242) No. of hospitals = 231

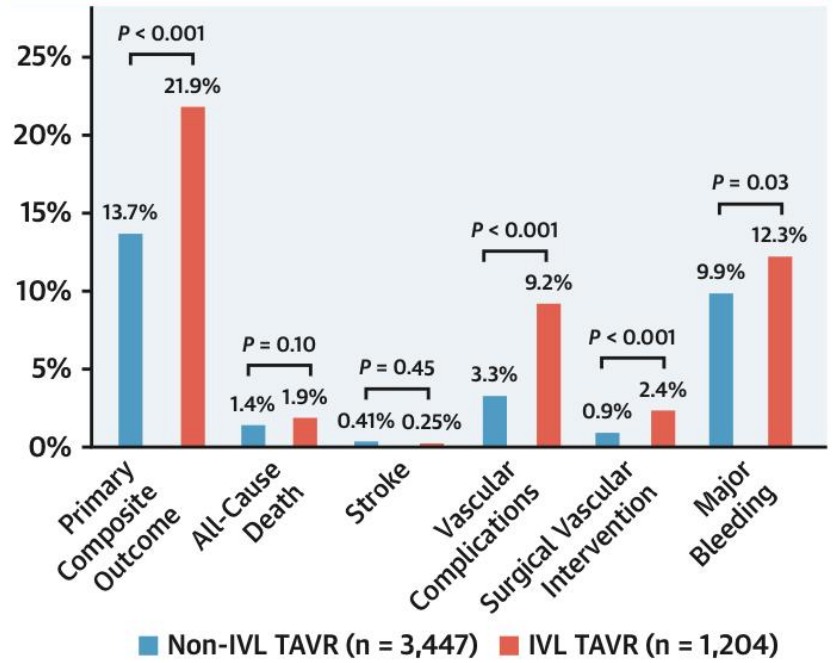
C IVL-Assisted TAVR (n = 1,242)

- **99.7%** Completed via TF approach (n = 1,238)
- **0.2%** Completed via alternative access
  - Transaxillary (n = 2)
  - Transcarotid (n = 1)
- **0.1%** Converted to SAVR (n = 1)

B National Trend of IVL Use With TAVR in the U.S.



D Propensity-Matched In-Hospital Outcomes



- Use of IVL to facilitate TF-TAVR increased over the study period but remains low
- TAVR was completed via a TF approach in 1,238 (99.7%) IVL TAVR patients
- IVL TAVR is associated with a higher primary composite outcome rate compared with non-IVL TAVR ($P < 0.001$), driven by higher rates of vascular complications, surgical vascular intervention, and major bleeding

Imran HM, et al. JACC Cardiovasc Interv. 2024;17(20):2367-2376.

Conclusions

- TF access is preferred for TAVI according to guideline recommendations based non-inferiority or superiority vs. SAVR in recents RCTs
- THV deliverability highly dependent of the combined effect of vessel lumen, tortuosity and vascular compliance
- IVL offers a promising option to facilitate TF access in hostile anatomies by gaining lumen and fracturing calcium, hence increasing vessel compliance