

# TCT 2025: Transcaval approach for combined TAVR and PCI in the setting of prohibitive iliofemoral tortuosity

## *Challenging Cases*

Andrea Mariani, MD; Nicolas M Van Mieghem, MD, PhD

---



**TCT**®

TRANSCATHETER  
CARDIOVASCULAR  
THERAPEUTICS®

# Disclosure of Relevant Financial Relationships

I, [Andrea Mariani](#) DO NOT have any financial relationships to disclose.

# Case Presentation

## Demographics

Gender: Male

Age: 81 yo

W: 82 kg

H: 157 cm

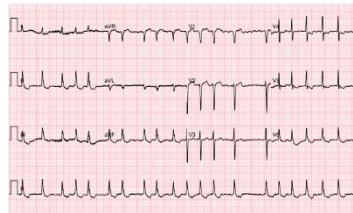
BMI: 33.32 kg/m<sup>2</sup>

## Presentation

Acute pulmonary edema (NYHA class IV)  
associated with angina pectoris (CCS class III)

## EKG

121 bpm, AF , LVH with strain



## Cardiac history

1990 Arterial hypertension

2015 Aortic abdominal aneurysm surgical repair

12/24 CVA (Left parieto-occipital embolic stroke)

12/24 Permanent AF with RVR (OAC: Apixaban 2.5 mg BID + Metoprolol and Digoxin)

## Other relevant medical history

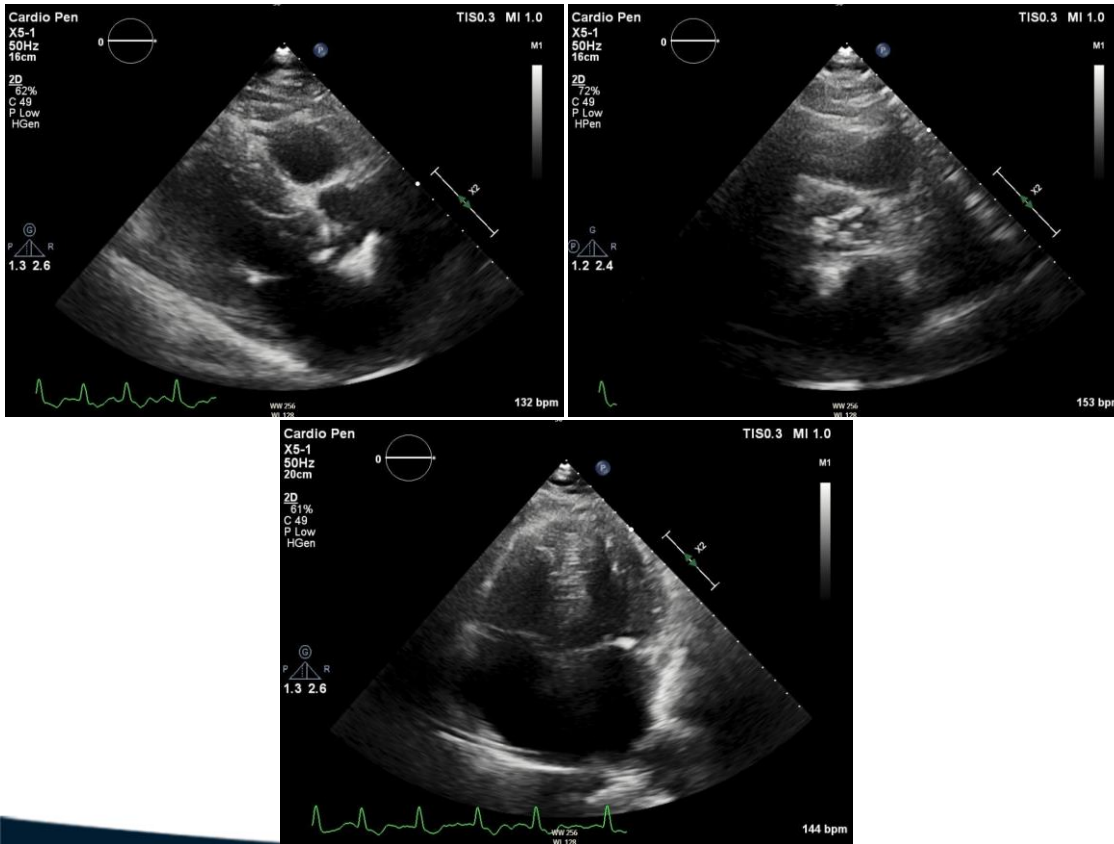
Gout

OSAS

Stage IV CKD (eGFR 26 ml/min/1.73m<sup>2</sup>)

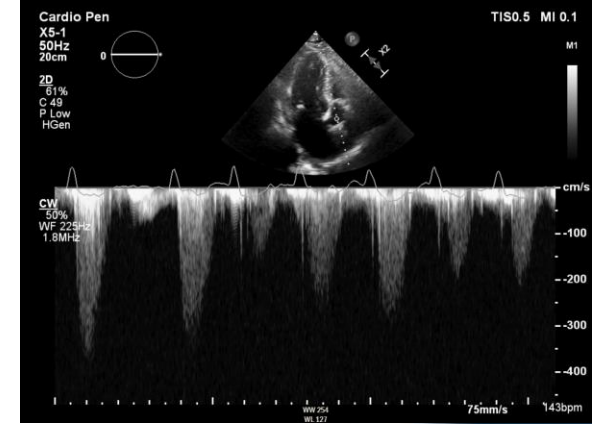
Hypercholesterolemia

# Transthoracic Echocardiography (TTE)

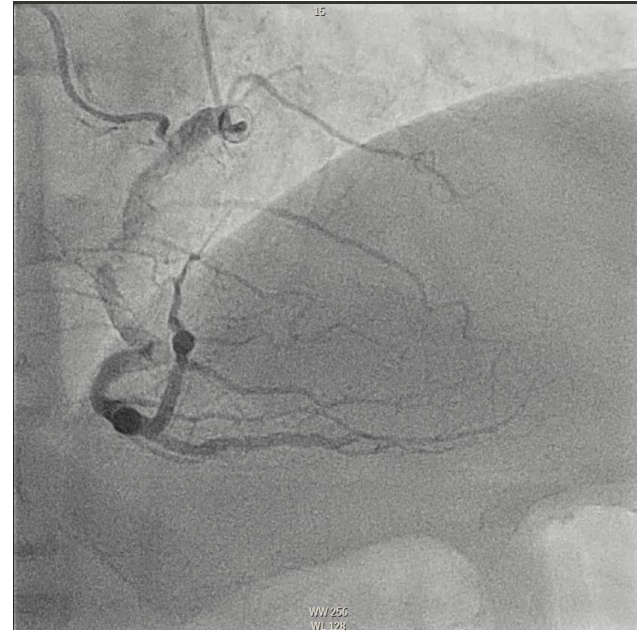


Normal LV function, severe LVH  
Biatrial dilatation ( $LAV_i$  40 ml/m<sup>2</sup>)  
Severe pLFLG aortic stenosis with  
calcified cusps:

- $SV_i = 24$  ml/m<sup>2</sup>
- $AVA_i = 0.38$  cm<sup>2</sup>/m<sup>2</sup>



# Coronary Angiography (CAG)



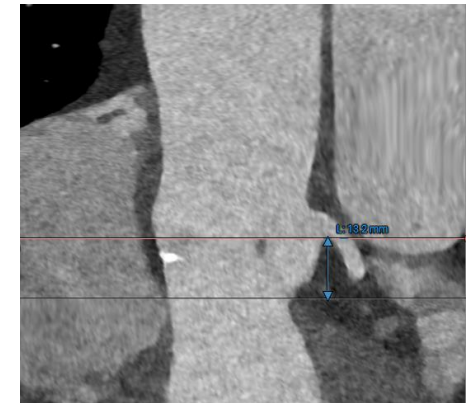
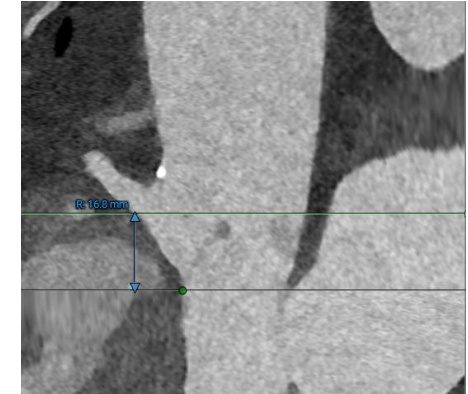
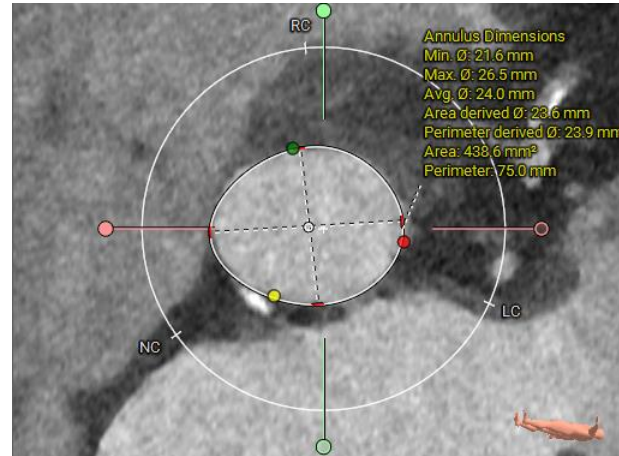
Right dominant circulation.

Significant calcific stenosis of mid RCA and mid LCX.

Diffuse, non-significant disease of LAD.

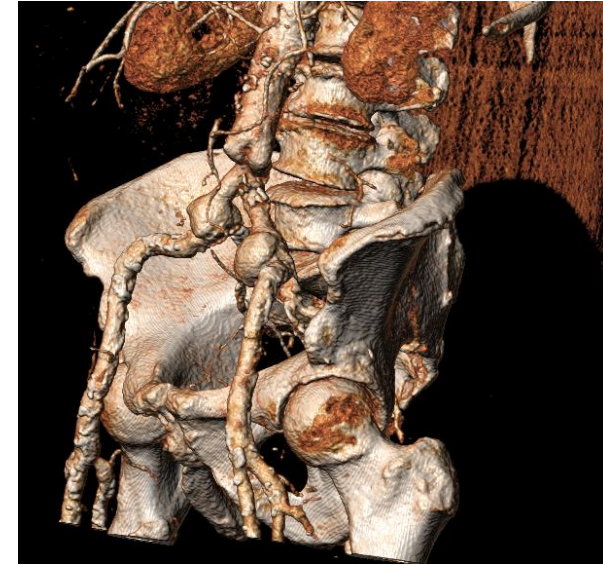
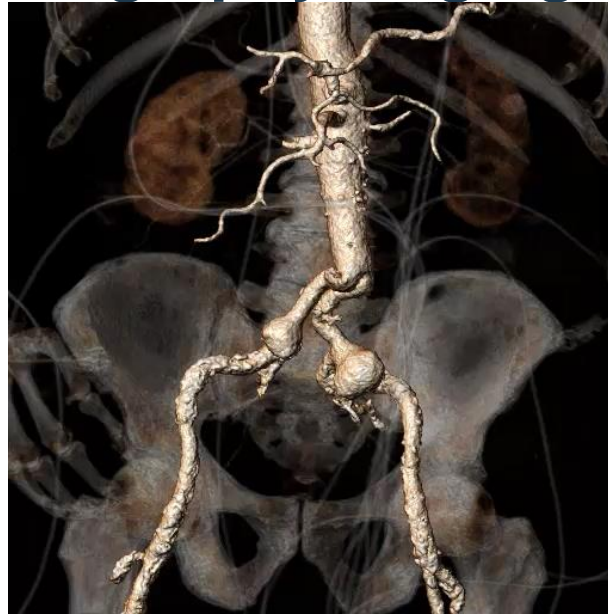
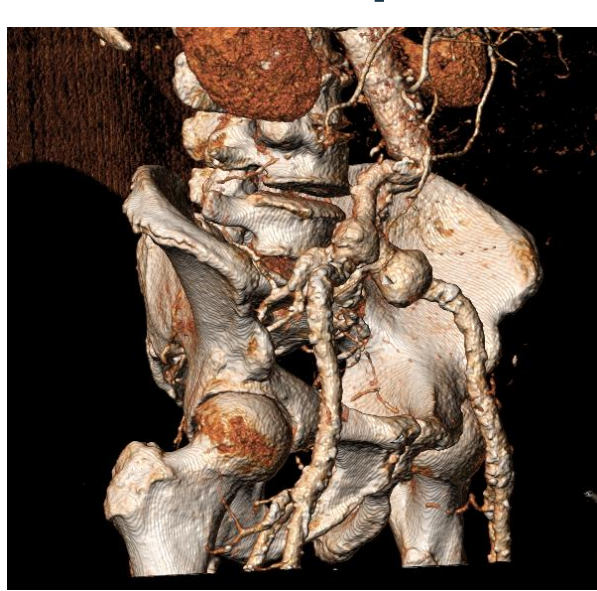


# Computed Tomography Angiography (CTA) #1



Moderately calcified tricuspid aortic valve;  
Small calcium spot at the level of VBR. No calcium in LVOT;  
Agatston score: 1900;  
MS length: 6 mm;  
LCA height: 13.2 mm, RCA height: 16.8 mm

# Computed Tomography Angiography (CTA) #2



Highly tortuous and aneurysmal  
iliofemoral arteries (right EIA  $D_{\max}$ : 27.2  
mm and left EIA  $D_{\max}$ : 32.1 mm)

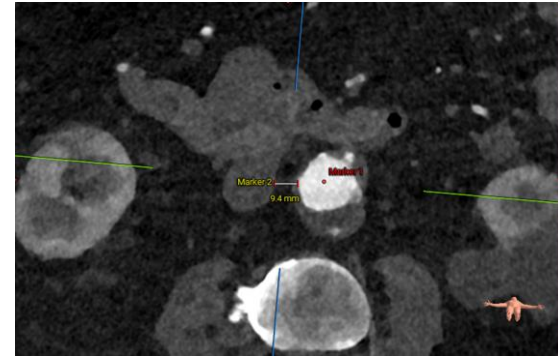


TF-TAVR approach not feasible

# Heart Team Discussion

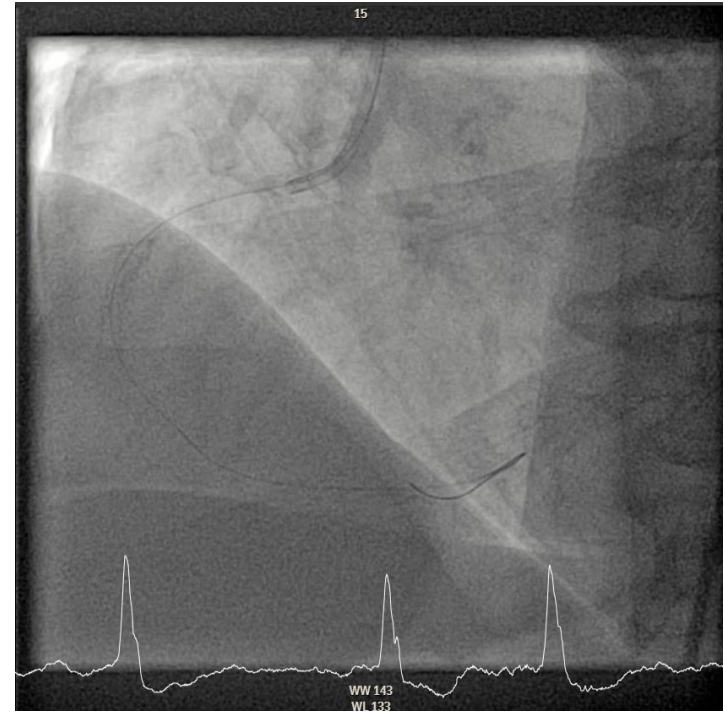
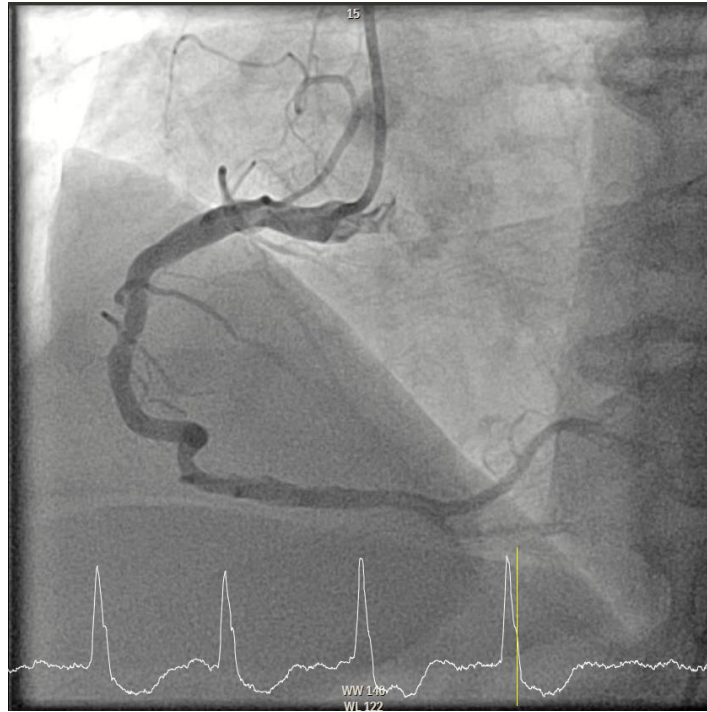
- Geriatric Assessment: frail patient. Impaired functional status. High risk for delirium and stroke (previous CVA);
- Surgical assessment: patient deemed too high risk for surgery;
- STS-PROM score: 5.69%;
- Consensus for PCI of RCA and LCX followed by transcaval-TAVI with Edwards Sapien 3 Ultra 23 mm.

Calcium-free target at L3 superior margin, no interposed viscerae and away from important arterial branches;  
VCI-abdominal aorta distance: 9.4 mm;  
Aortic diameter: 22.5 mm.



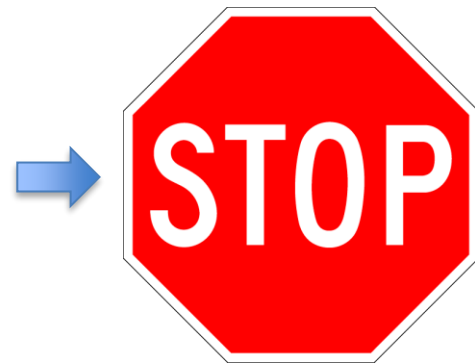
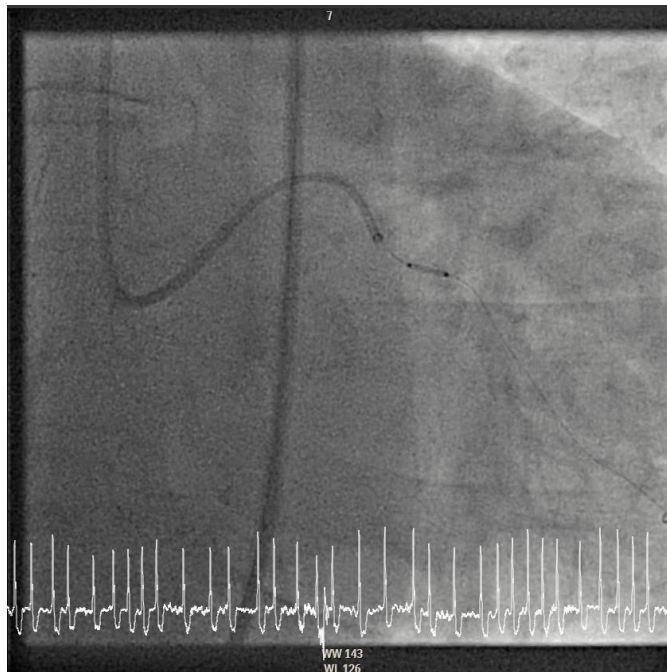


# Combined TAVR and PCI procedure #1: RCA-PCI



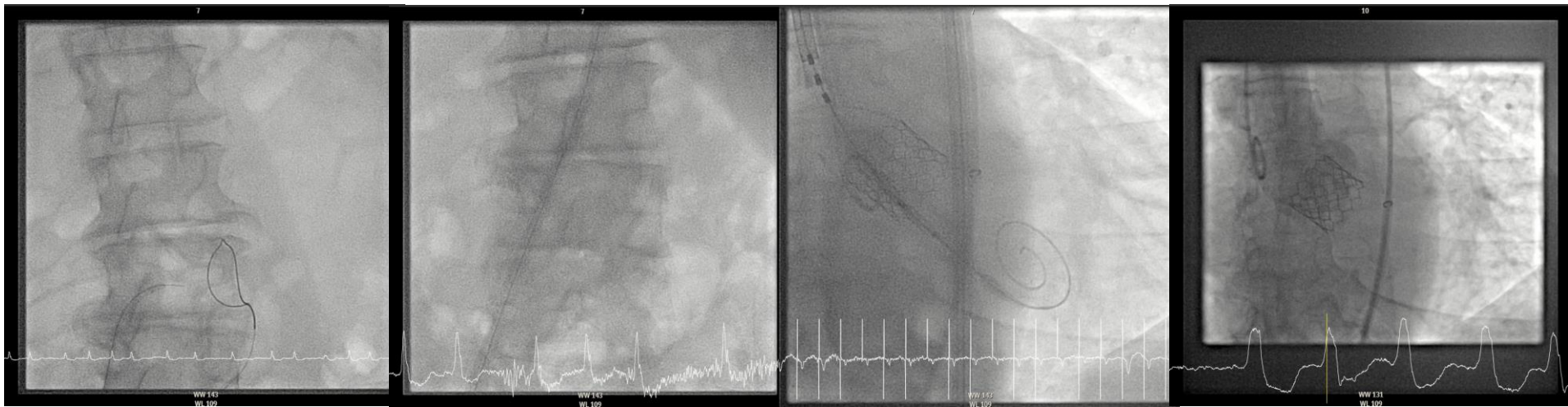
RCA-PCI with implantation of 3.50 x 15 mm EES, post-dilatated with 4.00 mm balloon.

# Combined TAVR and PCI procedure #2: 1<sup>st</sup> LCX-PCI attempt



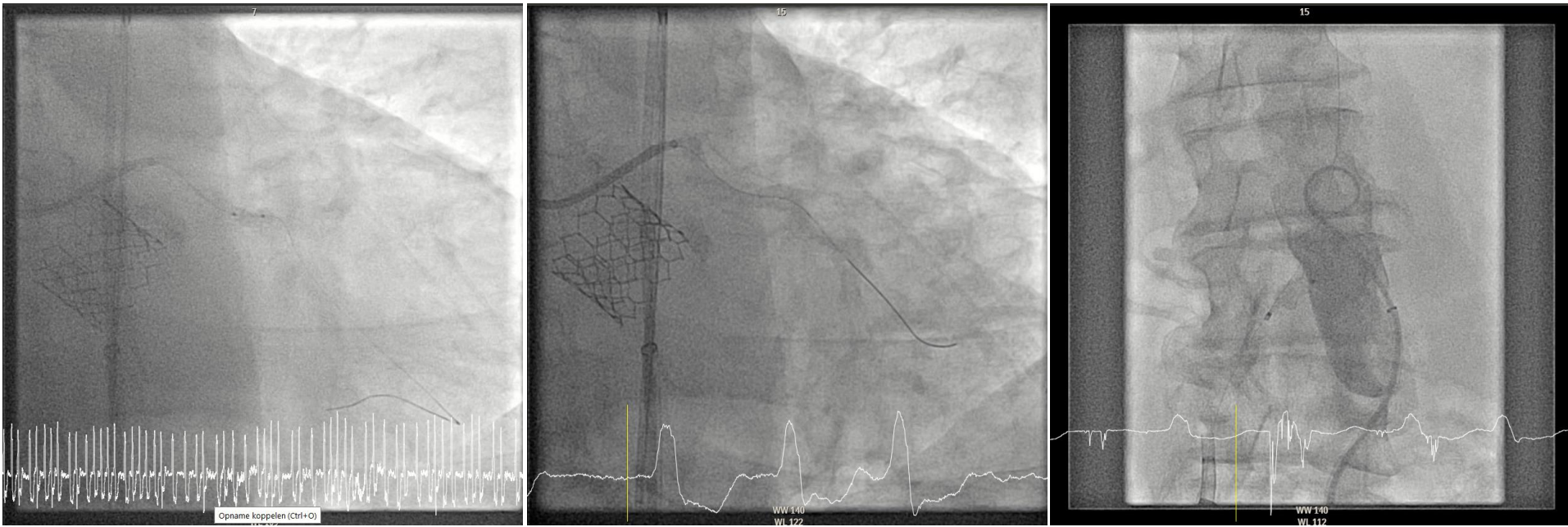
LCX-PCI could not be completed, despite the use of extra-support guidewire, 6 Fr guide extension catheter and up to 65 cm 7 Fr introducer sheath. This was due to severe ilio-femoral tortuosity + tortuosity and calcium of LCX.

# Combined TAVR and PCI procedure #3: Transcaval TAVR



Transcaval access was obtained in standard fashion with an electrified 0.014" Astato XS20 and 25 mm snare. 14 Fr eSheath was advanced across transcaval access via extra-stiff Lunderquist wire and Edwards Sapien 3 Ultra 23 mm was successfully deployed.

# Combined TAVR and PCI procedure #4: Transcaval LCX PCI



Successful LCX-PCI through transcaval access with implantation of 3.00 x 8 mm EES, post-dilatated with 3.50 mm OPN balloon.

Successful closure (type 1) of transcaval access with 8x10 mm ADO-1.



# Combined transcaval TAVR and PCI in literature

ACC.20  
TOGETHER WITH  
WORLD CONGRESS  
OF CARDIOLOGY

3306  
JACC March 24, 2020  
Volume 75, Issue 11



## FIT Clinical Decision Making

TRANSCAVAL IMPELLA-PROTECTED LEFT MAIN PCI WITH ROTATIONAL ATERECTOMY FOLLOWED BY TAVR AND RENAL ARTERY STENTING IN AN ELDERLY FEMALE WITH CARDIOGENIC SHOCK AND RENAL FAILURE DUE TO SEVERE AORTIC STENOSIS AND REGURGITATION

Poster Contributions  
Posters Hall\_Hall A  
Monday, March 30, 2020, 9:45 a.m.-10:30 a.m.

Session Title: FIT Clinical Decision Making: Interventional Cardiology 7  
Abstract Category: Interventional Cardiology  
Presentation Number: 1439-385

Authors: *Pavan Isanaka, Matthew Cauchi, Jason Foerst, Sulaiman Rathore, Joseph Rowe, Carilion Clinic Cardiovascular Institute, Roanoke, VA, USA*

JACC: CARDIOVASCULAR INTERVENTIONS  
© 2024 BY THE AMERICAN COLLEGE OF CARDIOLOGY FOUNDATION  
PUBLISHED BY ELSEVIER

VOL. 17, NO. 21, 2024

## IMAGES IN INTERVENTION

### Transcaval Impella-Assisted CHIP-PCI and Transcaval TAVR With Impella Removal in Freshly Implanted TAVR



Michael Chiang, MBBS, Alvin H.Y. Ko, MBChB, Cheuk Bong Ho, MBBS, Esmond Y.H. Fong, MBBS, Ivan Wong, MBBS, Shing Fung Chui, MBChB, Ka Chun Alan Chan, MBBS, Chi Yuen Wong, MBBS, Kam Tim Chan, MBBS, Kang Yin Michael Lee, MBBS

Only two case reports in which, however, PCI was Impella-protected, after THV implantation. Moreover, transcaval route was chosen for PAD severity, not ilio-femoral tortuosity as in our case.

# Conclusion

- Transcaval access is primarily established as a bailout route for TAVR in non-transfemoral candidates;
- Its use for concomitant PCI during TAVR procedure remains less frequently reported, especially in patients with severe ilio-femoral tortuosity;
- This case underscores the value of the transcaval access route as a viable and effective alternative for patients with prohibitive iliofemoral anatomy to facilitate catheter negotiation and navigation also in complex coronary interventions.