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Hostile femoral access in patients undergoing TAVR

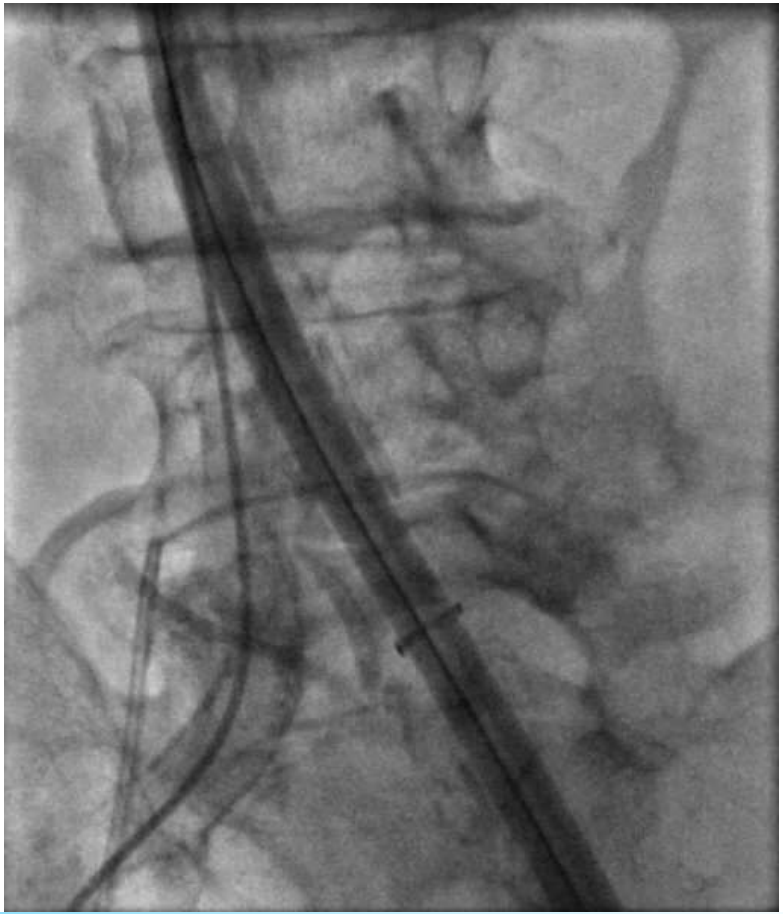
What's the best choice?

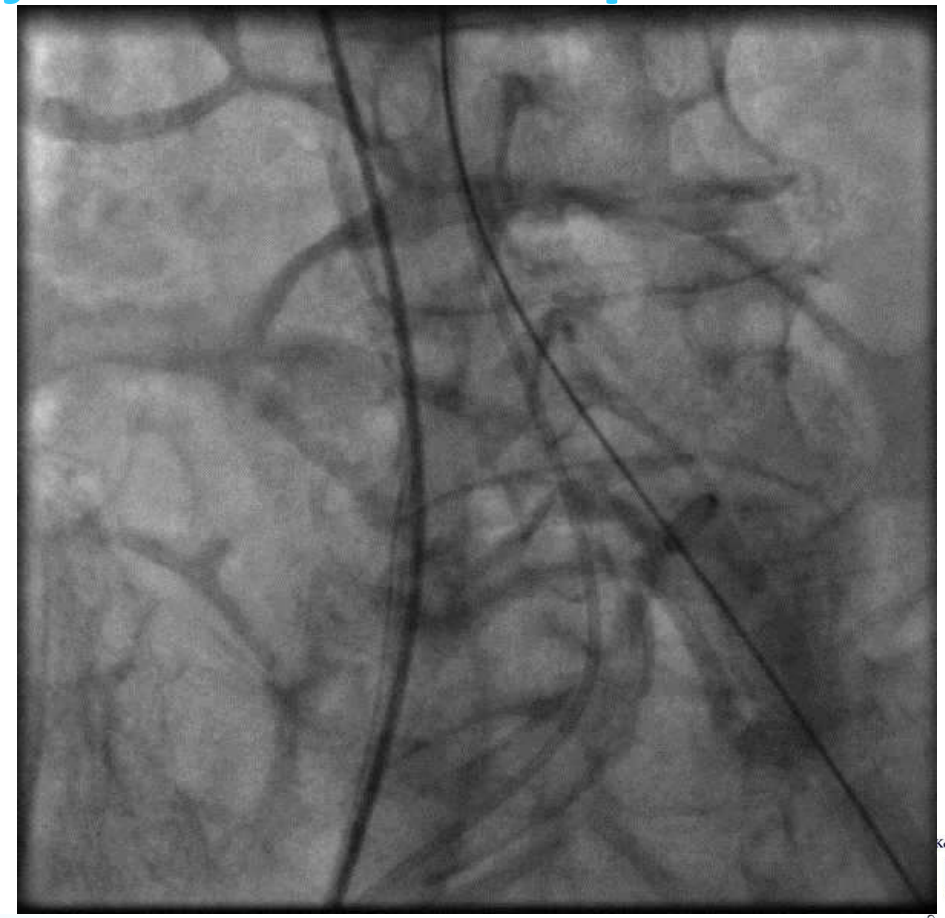
Kentaro Hayashida MD, PhD, FESC, FACC, FJCS

Disclosure

A clinical proctor for Edwards Lifesciences, Medtronic, and Abbott

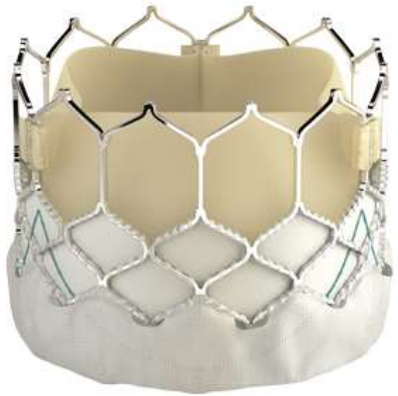
Hostile femoral access and major vascular complication





TF approach in most cases

Sapien 3
Ultra RESILIA



14-16 Fr
E sheath+

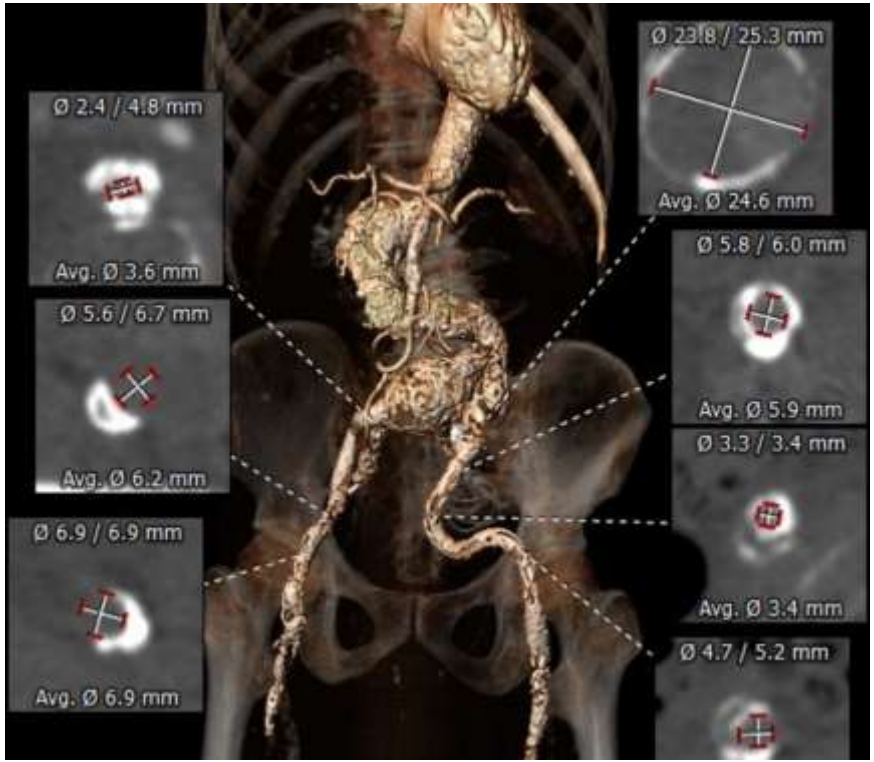
Navitor

14-15 Fr
Integrated sheath

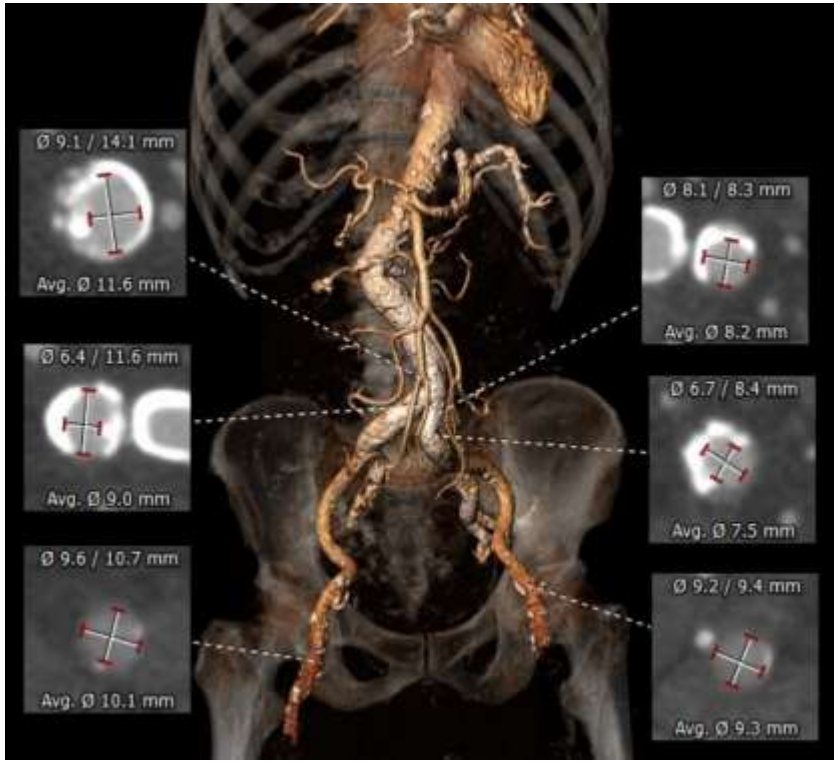
Evolut FX

14 Fr
In-line sheath

How far can we negotiate?



Impossible



Challenging, but doable

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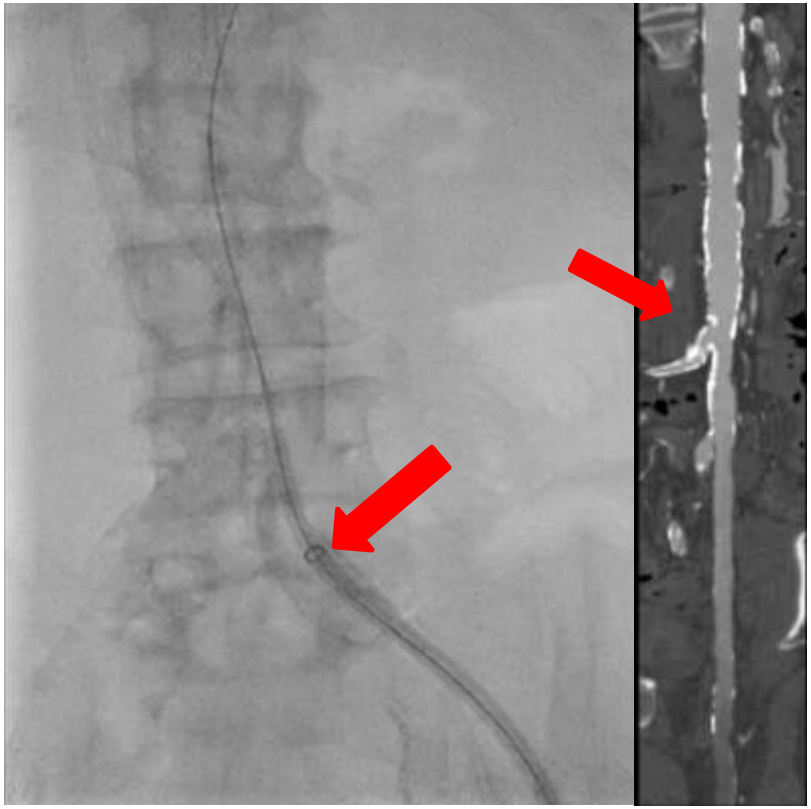
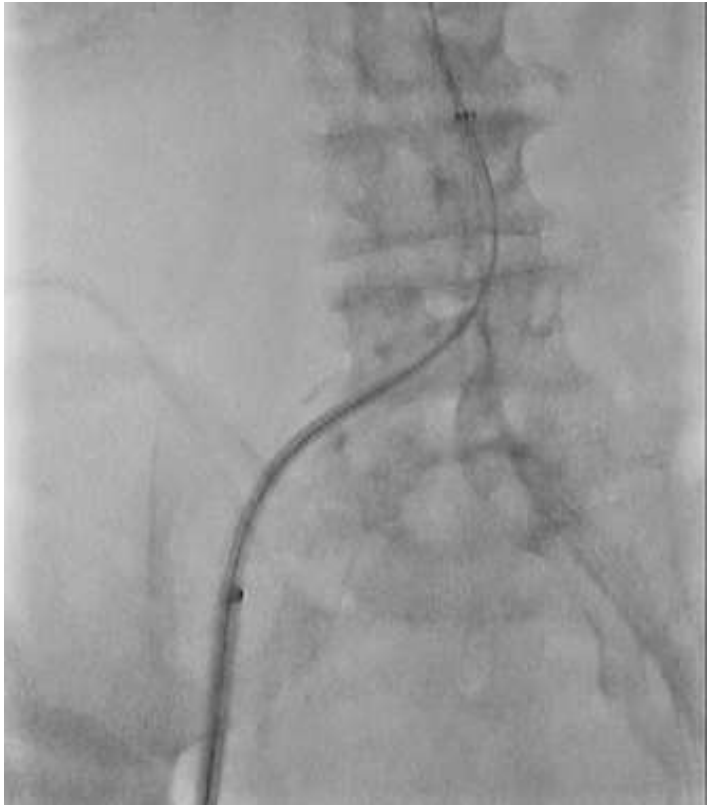
TF-TAVI

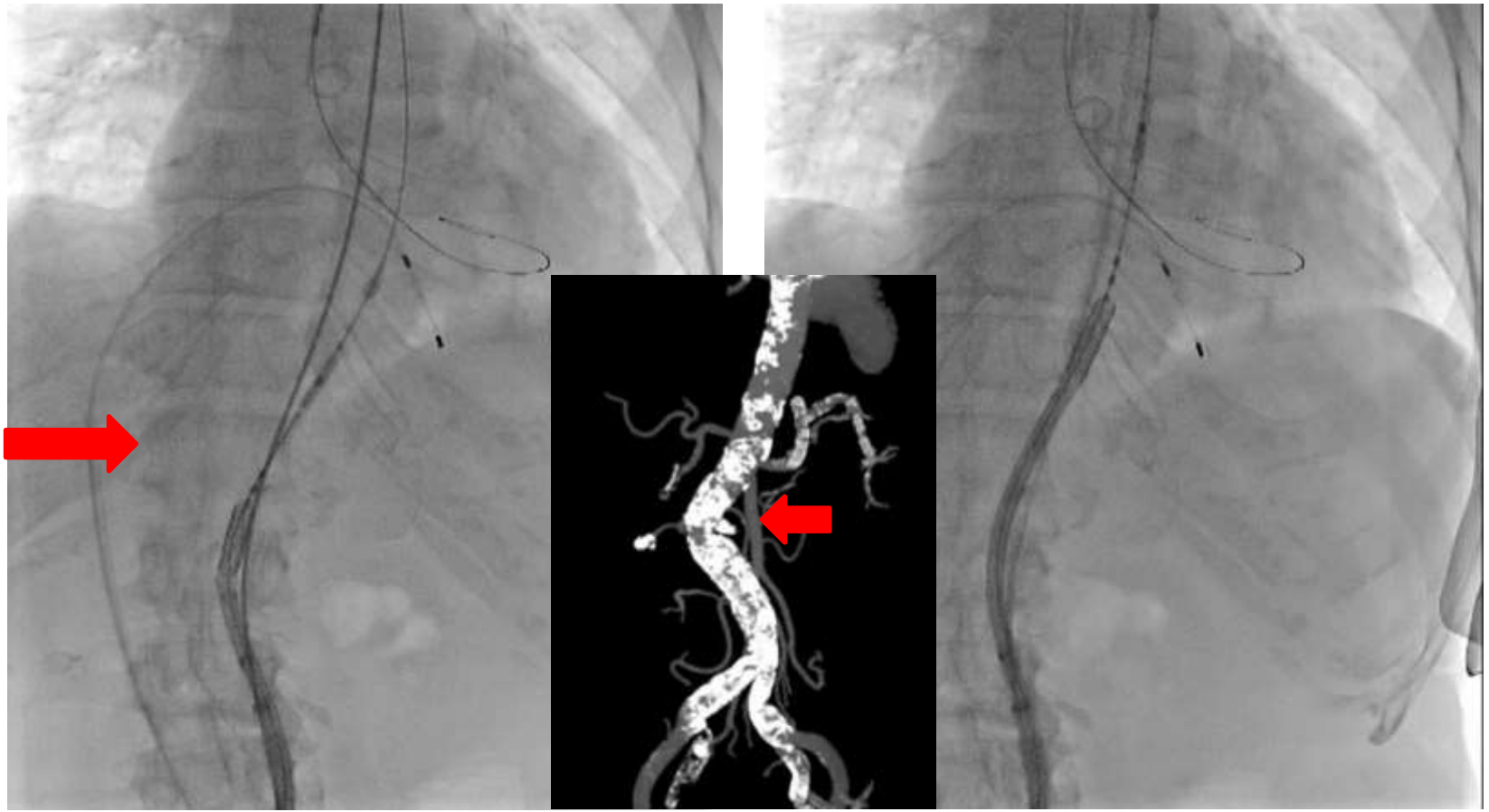


Started from the left side
but we could not advance the sheath

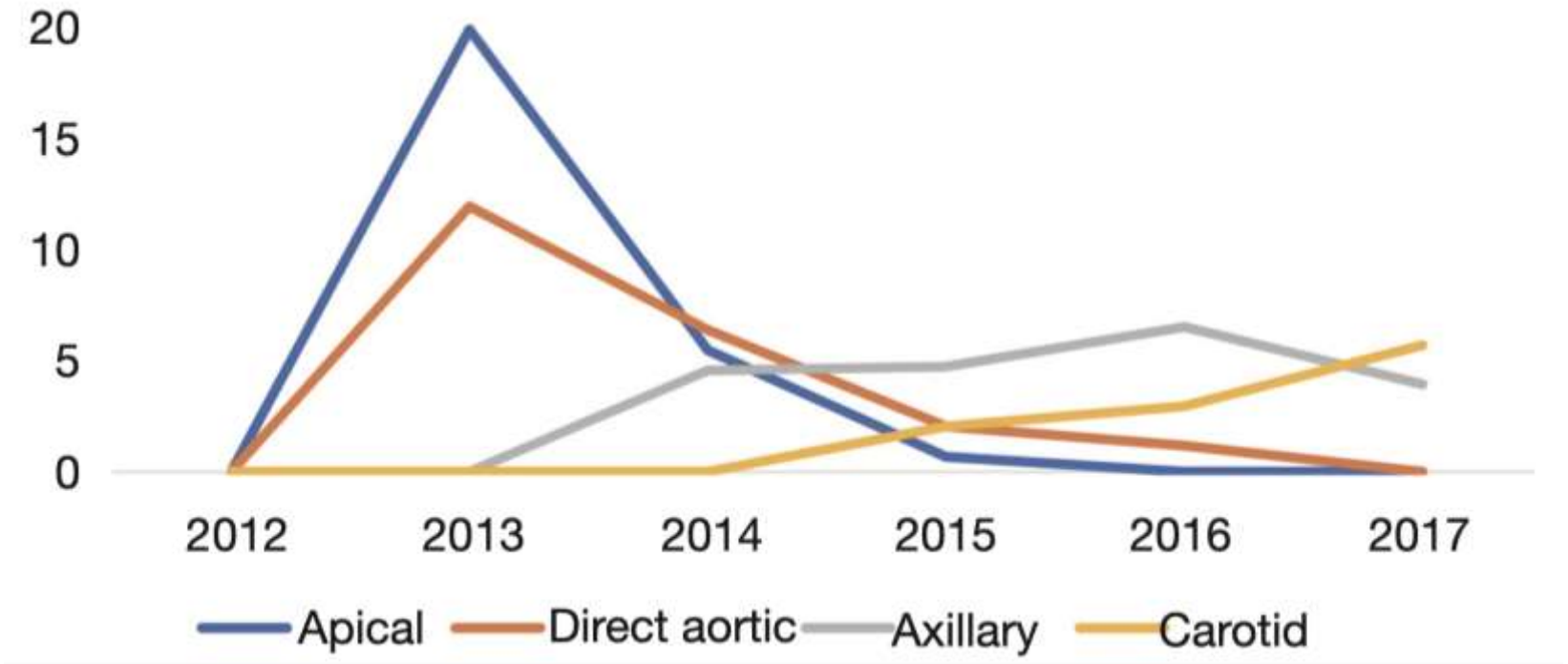


Successfully advanced the sheath to
the terminal aorta

Need some negotiation even in the abdominal aorta



Alternative access trend

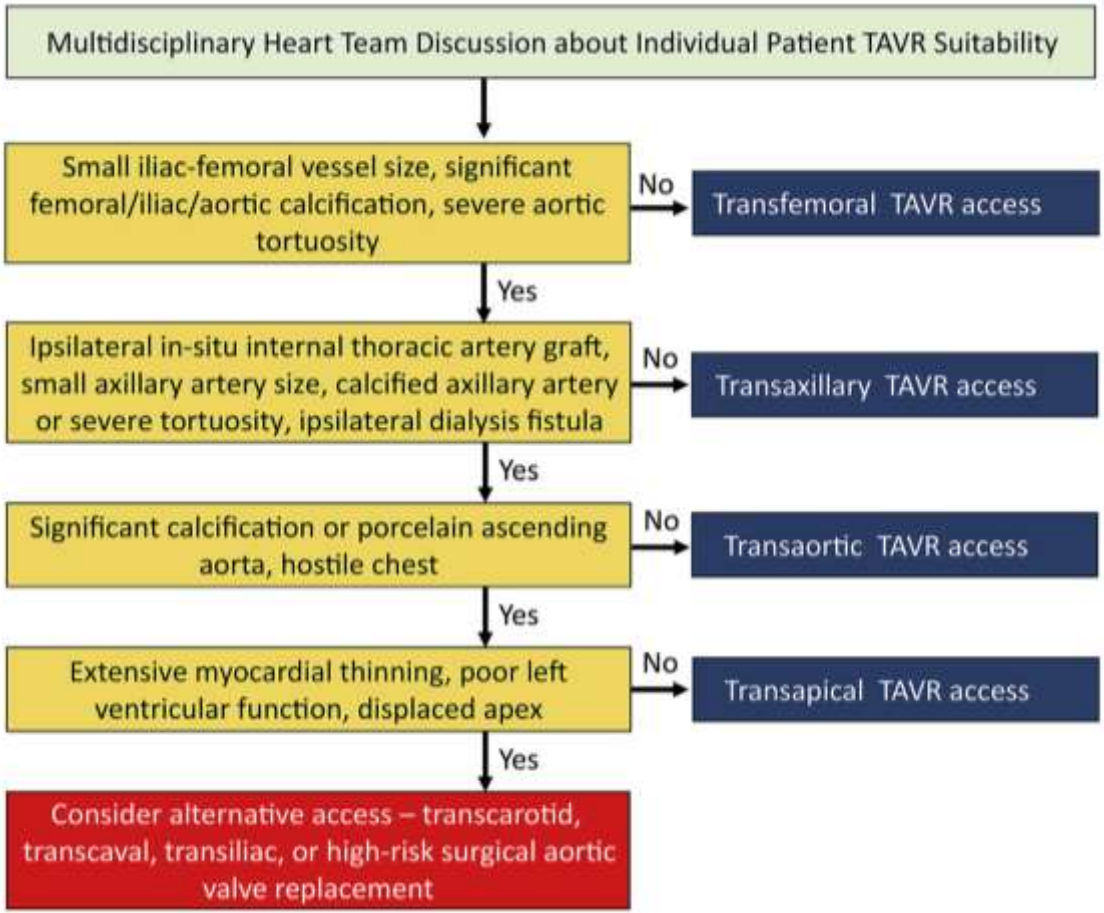


Banks et al. Cardiovasc Diagn Ther. 2020

Alternative accesses

- **Transapical**
- **Transaortic**
- **Transabdominal**
- **Transiliac**
- **Transaxillary**
- Transcarotid
- Transcaval

Decision flowchart choosing TAVR access



Kindzelski et al. Ann Thorac Surg 2021

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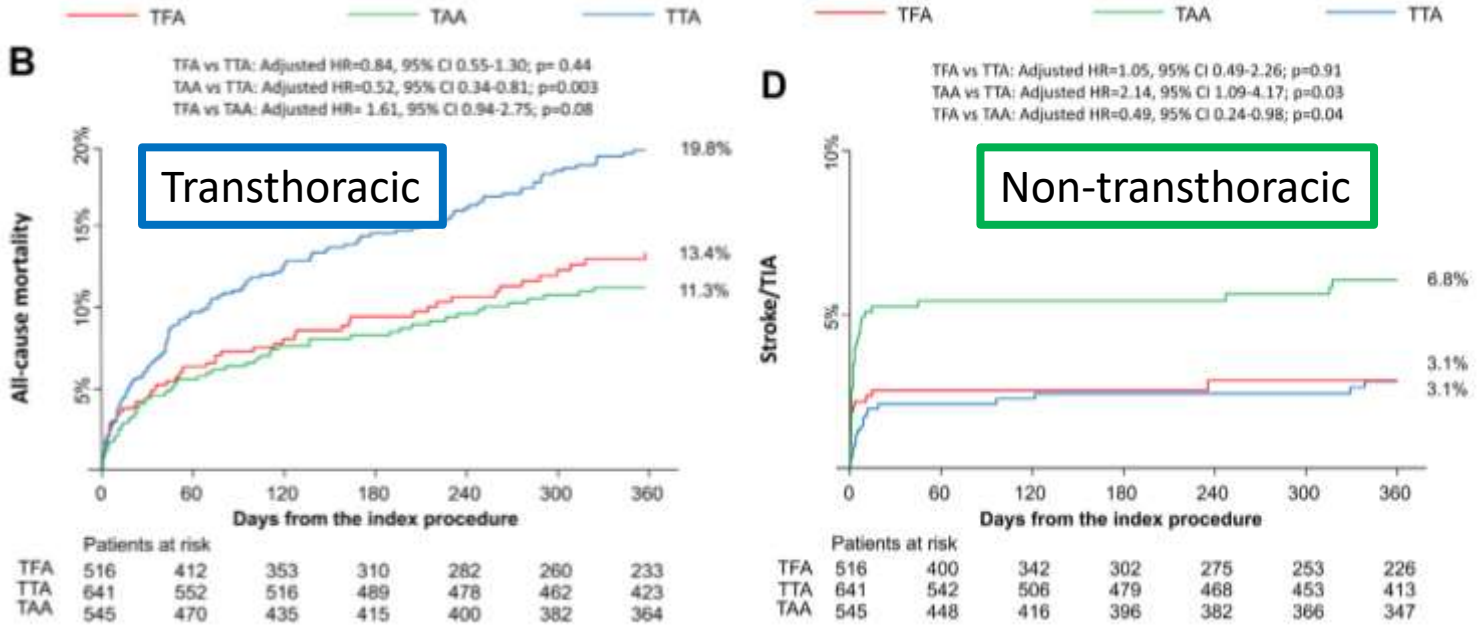
TAVR in patients with PAD: The Hostile registry



1707 patients

TF+percutaneous 518 (30.3%), Transthoracic 642 (37.6%), Non-Transthoracic 547 (32.0%)

- Both TFA and TAA: lower 30-day rates of MAE, driven by fewer access complications
- TF compared with non-transthoracic was associated with lower 1-year risk of stroke

Palmerini et al. JACC Cardiovasc Interv. 2023

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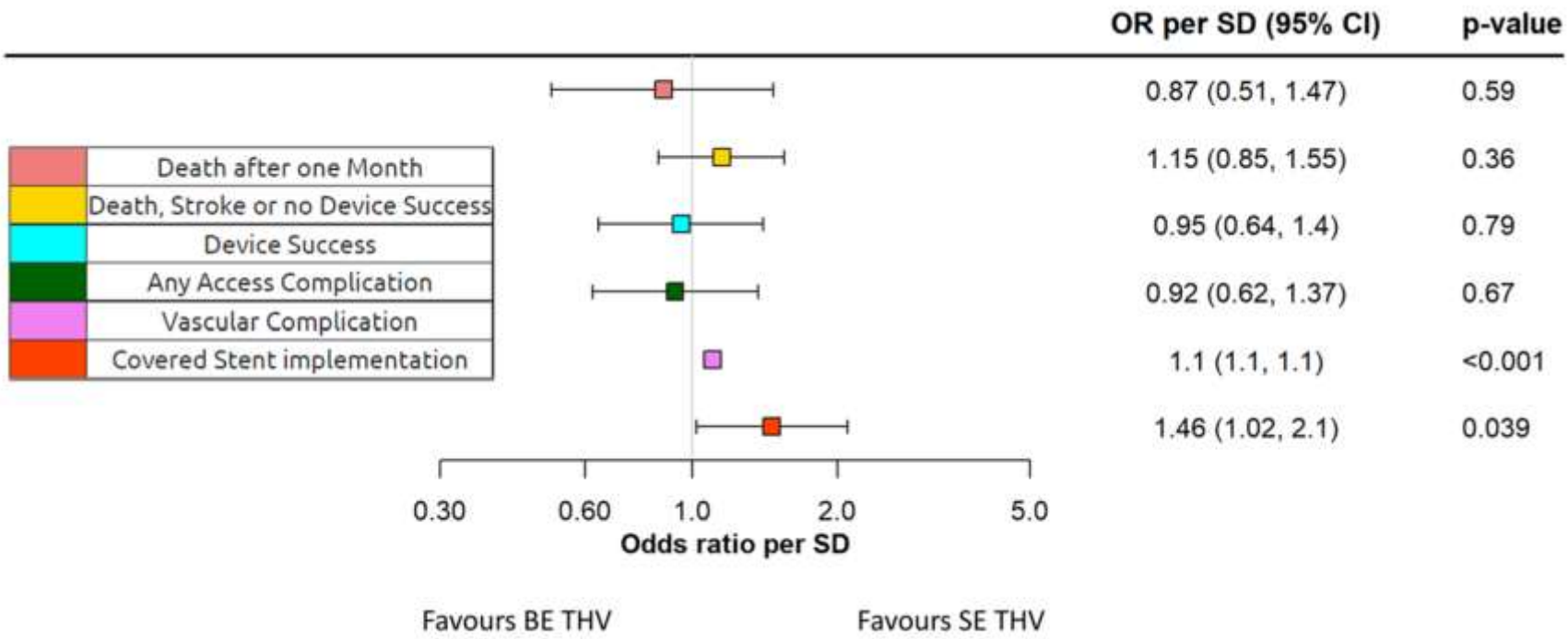
Transaxillary access, TAXI registry
SE: lower vascular complications



Schaefer et al. Clin Res Cardiol. 2023

Transcarotid vs. transaxillary

Cardiovascular Revascularization Medicine 33 (2021) 20–25

Contents lists available at ScienceDirect

Cardiovascular Revascularization Medicine

Outcomes of Transcarotid Versus Trans-Subclavian Transcatheter Aortic Valve Replacement: A Systematic Review and Meta-Analysis

Mostafa R. Amer [a], Wassim Mosleh [b], Michael Megaly [c], Tanvi Shah [d], Yinn Shaung Ooi [a], Raymond G. McKay [e,*]

Meta-analysis
Similar 30-day outcomes
A trend towards higher rates of major vascular complications and pacemaker with the TAx

CRM 2021

Transaxillary compared with transcarotid access for TAVR: a propensity-matched comparison from a French multicentre registry

Nicolas Debry[1,2,3]*, MD; Talel Raouf Trimech[a], MD; Thomas Gandet[3], MD; Flavien Vincent[1,2], MD, PhD; Ilir Hysi[a], MD; Cédric Delhaye[1], MD; Guillaume Cayla[3], MD, PhD; Mohamad Koussa[1], MD; Francis Juthier[2,3], MD, PhD; Florence Leclercq[3], MD; Max Pécheux[3], MD; Saïd Ghostine[a], MD; Julien Labreuche[4]; Thomas Modine[1], MD, PhD; Eric Van Belle[1,2], MD, PhD

Propencity-match comparison
1M mortality, stroke/TIA and 1-year mortality were similar
Transcarotid access was accompanied by more minor bleeding and main access hematoma

EuroIntervention 2020

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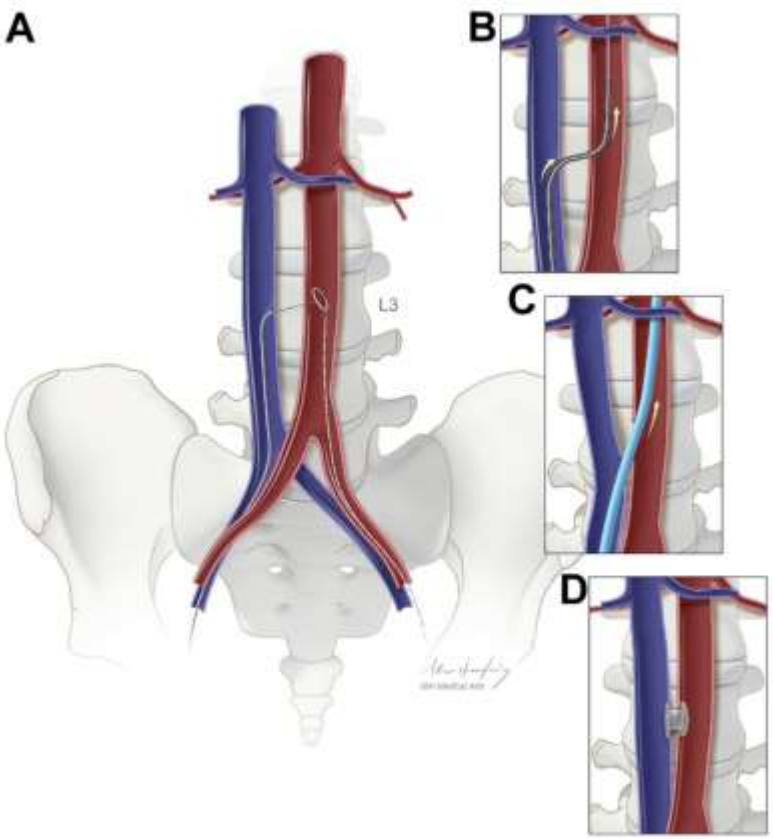
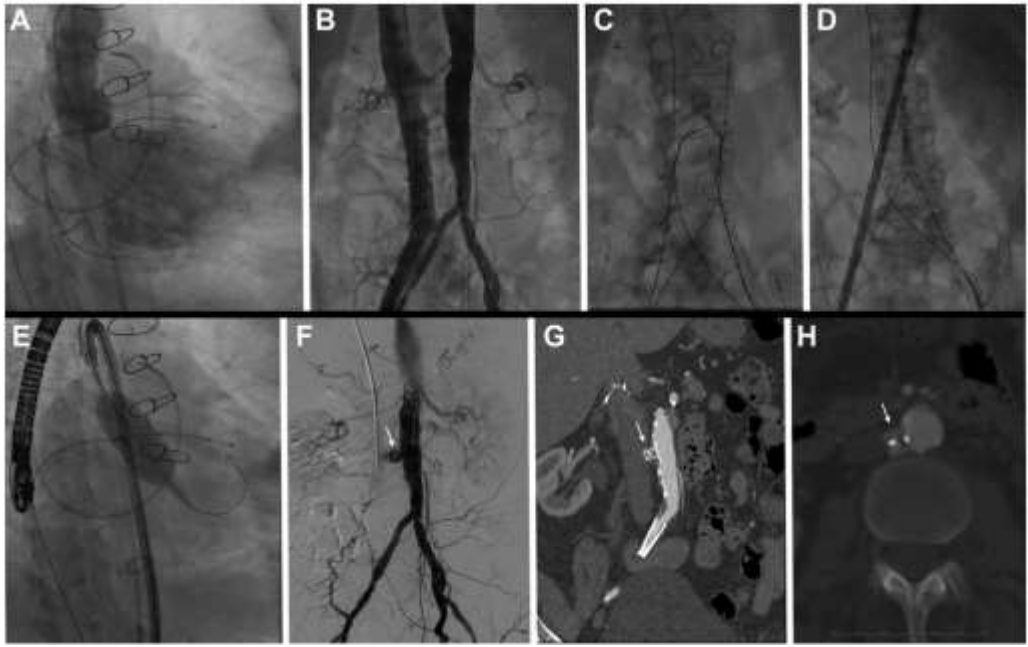
Transcaval TAVR





19 cases, successful in 17 cases
6 major vascular complication

Greenbaum et al. JACC 2014

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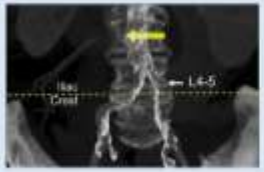
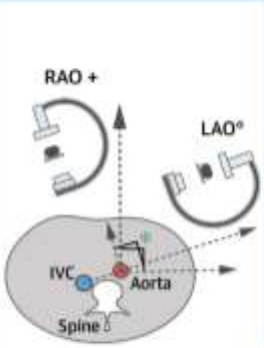
Transcaval access is reaching maturity



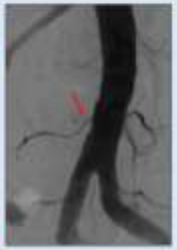
Permissive transcaval physiology
- Retroperitoneal pressure > venous
- Aortic bleeding decompresses into nearby IVC hole

CT planning
- Calcium-free target window
- Without interposed bowel
- Away from aortic branches
- Orthogonal fluoroscopic projection angles

Electrosurgical guidewire traversal
- Coaxial crossing system
- Pre-position snare in aorta
- Confirm orientation in orthogonal projections
- Brief electrosurgical wire advancement
- Ensnare and exchange for rigid guidewire and TAVR introducer



Transcaval tract closure
- Heparin reversal with protamine
- Prepare for bailout
- Deflectable sheath turns nitinol occluder sideways
- Fixation is from occluder neck not disc
- Release device



Interpret closure aortogram
- Troubleshooting (residual fistula is acceptable; extravasation warrants additional maneuvers)
- Balloon aortic tamponade or bailout covered stent if needed

Lederman RJ, et al. J Am Coll Cardiol Intv. 2023;16(4):371-395.

JACC: CARDIOVASCULAR INTERVENTIONS VOL. 16, NO. 4, 2023
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STATE-OF-THE-ART REVIEW

Transcaval Access and Closure Best Practices

Robert J. Lederman, MD,[a] Adam B. Greenbaum, MD,[b] Jaffar M. Khan, PhD, BMBCh,[a,c] Christopher G. Bruce, MBChB,[a] Vasilis C. Babaliaros, MD,[b] Toby Rogers, PhD, BMBCh[a,d]

Lederman et al. JACC Intv 2023

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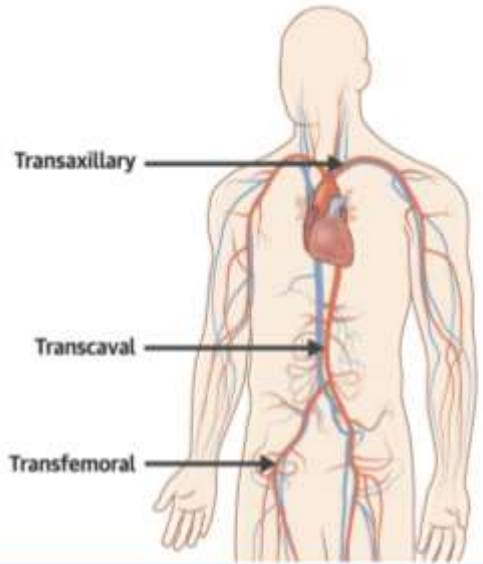
Transcaval versus transaxillary TAVR

Transcaval vs Transaxillary Access for TAVR, N = 344



In-Hospital Events	Transcaval (n = 238)	Transaxillary (n = 106)	Transfemoral (n = 7,132)
Stroke or TIA	3% *	13%	2%
Bleeding †	10%	13%	4%
Death	4%	4%	1%
Discharge home without stroke/TIA	88% *	62%	90%

* $P < 0.001$ Transcaval vs Transaxillary
† Major or life-threatening bleeding (VARC-3 ≥ Type 2)

Lederman RJ, et al. J Am Coll Cardiol Intv. 2022;15(9):965-975.

- 8 US centers
- Transcaval TAVR had lower rates of stroke and similar bleeding compared with transaxillary access
- Both approaches had more complications than transfemoral access

Internal Endoconduit for Unfavorable Iliac Artery for TAVR

Lee et al. Acta Cardiol Sin 2018

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Conclusion

- Hostile femoral access is sometimes challenging
- Transaxillary access is less invasive, but may be associated with higher risk of stroke
- Transcarotid approach demonstrates similar results with less stroke compared to transaxillary access
- Transcaval approach is reaching its maturity
- Avoiding complication by meticulous screening and patient selection are important
- Don’t forget SAVR!