

VASCULAR ACCESS

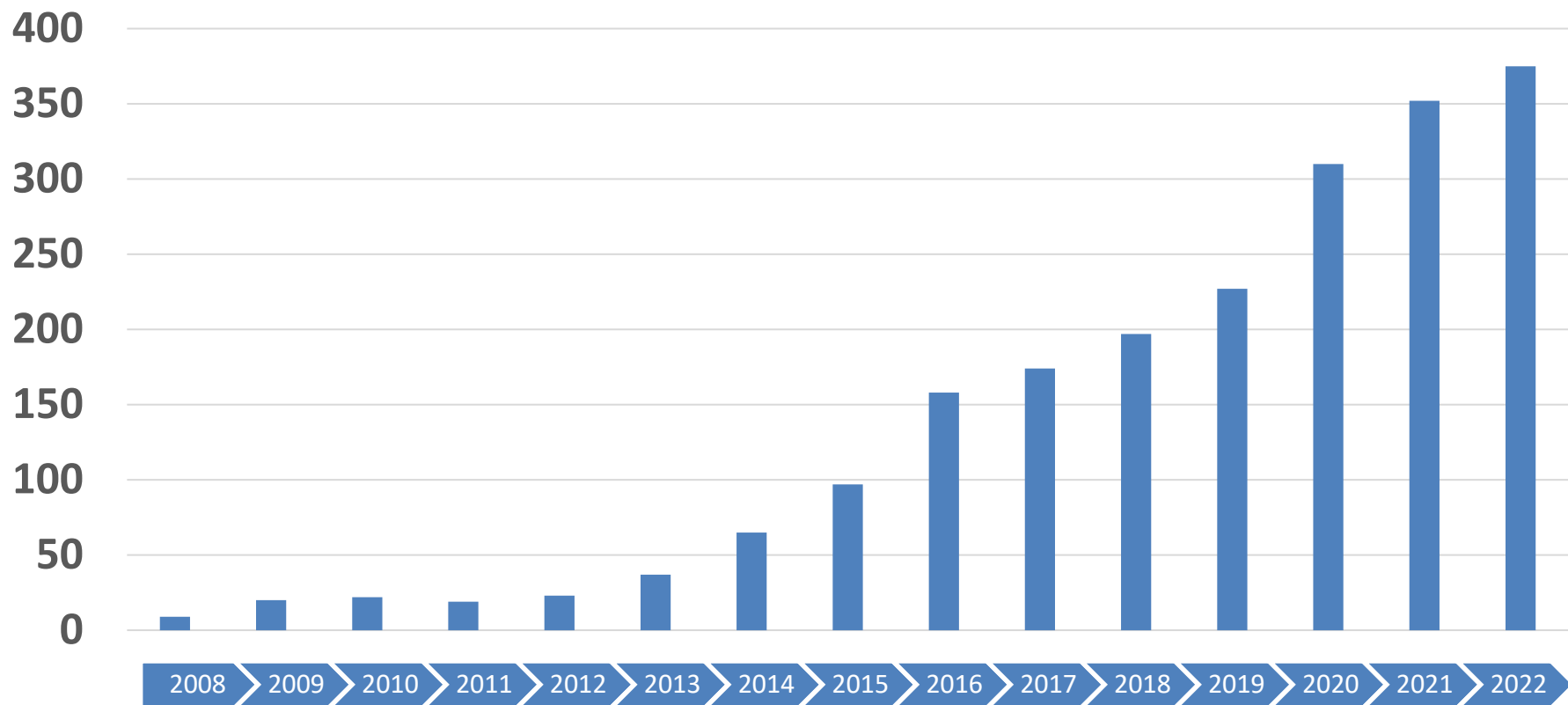
Femoral First – How and When?

BERNARD PRENDERGAST

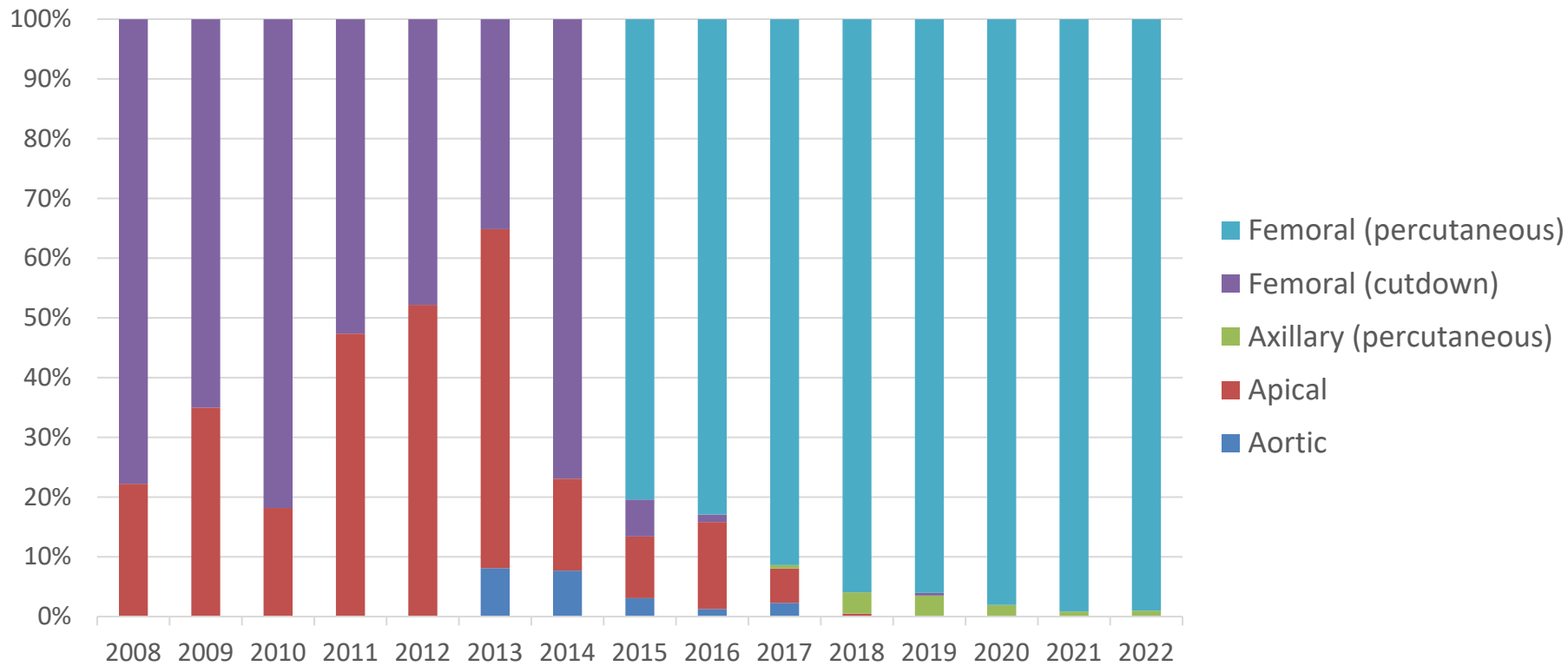
ST THOMAS' HOSPITAL AND CLEVELAND CLINIC LONDON



The St Thomas' Hospital TAVI Programme



The St Thomas' Hospital TAVI Programme



TRANSFEMORAL TAVI IS A CLEAR WINNER...

Meta-analysis of 7 RCTs

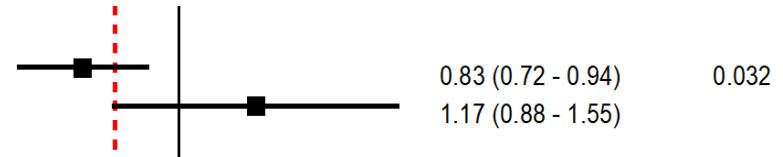
Siontis G et al, European Heart Journal (2019)

MORTALITY

Access route

Transfemoral

Transthoracic



*17% relative risk reduction
up to 2 years*

0.2

0.5

1

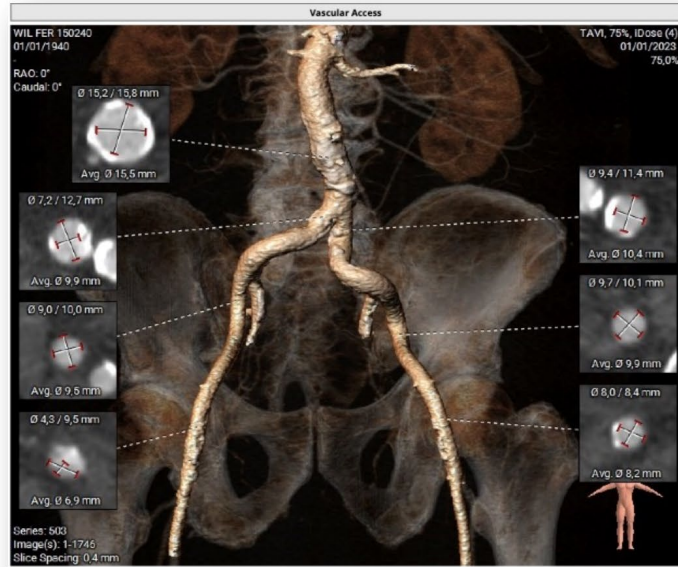
2

5

Favours TAVI

Favours SAVR

BUT CAUTION IS REQUIRED...



Ex vivo maximum expansion at pusher site



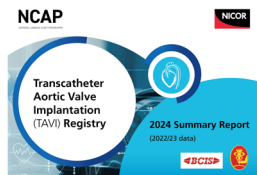
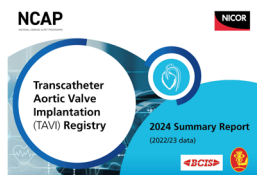
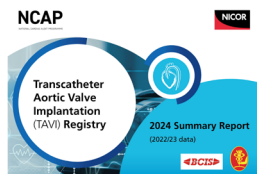
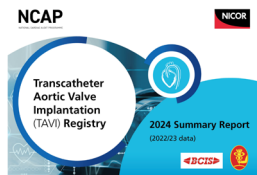
TAVR Delivery Systems – Outer Diameters (mm)

Evolut R	23	26	29	34
EnVeo PRO delivery system	6	6	6	6
Evolut Pro	23	26	29	
EnVeo PRO delivery system	6.7	6.7	6.7	
Sapien 3	20	23	26	29
Commander Delivery System with eSheath	5.8	7.5	5.8	7.6
Acurate Neo 2	S	M	L	
14 F iSLEEVE	6.0	7.5-8.0	6.0	7.5-8.0
Portico	23	25	27	29
FlexNav Delivery System	6.0	6.0	6.3	6.3

- Careful evaluation of the aorta and ileo-femoral arteries
- Respect size – there's no “real 14F” TAVR delivery system
- Watch out for circular or horse shoe calcification
- Tortuosities + Calcification may prevent VDS to pass

Transcatheter Aortic Valve Implantation (TAVI) - Report at a glance

2022/23 data unless otherwise stated.



32 NHS centres in England, Wales and Northern Ireland are providing TAVI procedures



7,669 TAVI procedures performed in 2022/23, a **13%** rise compared with 2021/22



25% of TAVI procedures are performed as urgent cases



94% of TAVI procedures are performed with conscious sedation



96% of TAVI procedures are performed via percutaneous femoral arterial access



3 days median length of stay for elective procedures



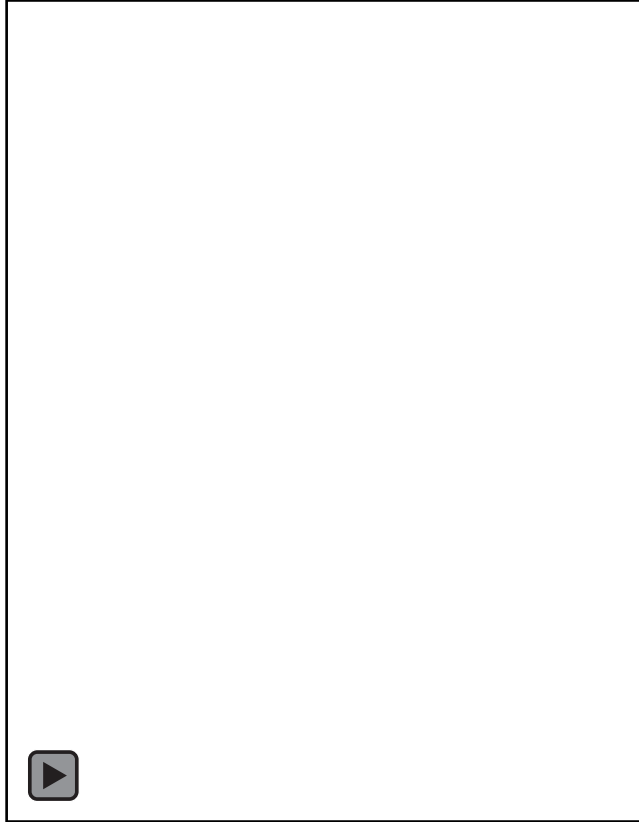
<2% major complications following a TAVI procedure

- **1.4%** stroke
- **1.0%** major bleeding
- **1.4%** major vascular access complications
- **1.8%** moderate-severe AR after TAVI implant



7.4% requirement for a pacemaker following a TAVI procedure (down from **15%** in 2015/16).

What are we trying to avoid?





Considerations for Planning Hostile Access TAVI

- Local equipment and expertise
- Anatomical considerations
 - Vessel depth and calibre
 - Calcification
 - Tortuosity
 - Previous intervention (e.g. EVAR, vascular stents)

Micropuncture

Micropuncture® Introducer Set
Silhouette® Transitionless
With Nitinol Wire Guide

REF **MPIS-401-NT-SST**

REF **G47942**

21G / 7cm
.018" / 40cm
4.0Fr / 10cm

Rx only

STERILE EO
LOT 14299022
2024-10-21
2021-10-21

cookmedical.com/symbol-glossary

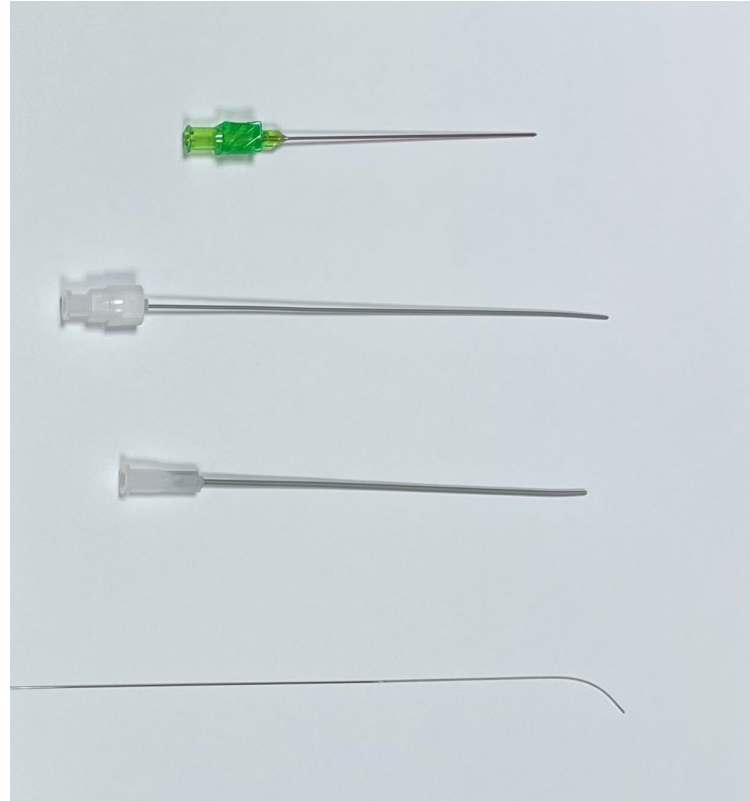
CE 0123

REF MPIS-401-NT-SST
REF G47942
LOT 14299022

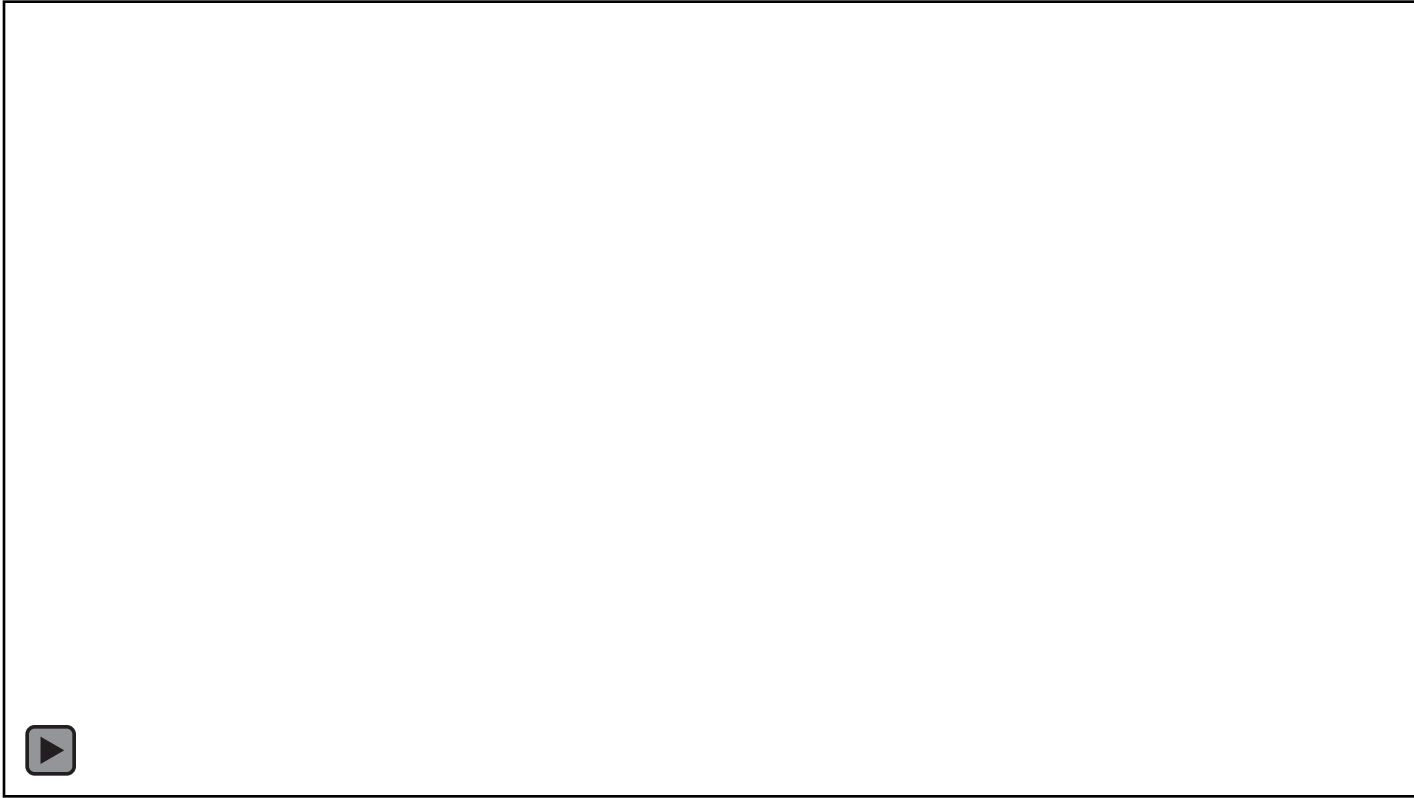
COOK MEDICAL
Cook Incorporated
750 Daniels Way
Bloomington, IN 47404 USA
MADE IN USA

EC REF Cook Medical Europe Ltd.
O'Halloran Road,
National Technology Park,
Limerick, IRELAND

A2_REV2



Incremental gains...



Planning the procedure

Name		Clinic Date:		IP	
MRN		MDT Date:		27/04/23	
DoB	Age	Height + Weight	cm	71kg	

Oxford University Hospitals **NHS**
NHS Foundation Trust

Presenter	
Referrer	

Details	PMH	Coronaries	EF	40%
Admitted to with increased breathlessness and peripheral oedema. New fast AF and hypertension. No chest tightness or syncope	AF- on Rivaroxaban	Angio 14/4/23 LMS- clear LAD- mild mid vessel and Os D2 lesions Cx mild atheroma RCA dominant mild atheroma	MG/PG	44/73
			AVA	0.4cm ²
			ECG	AF, narrow
			Creat	118

Aortic Annulus
Perimeter: 78.6 mm
Perimeter Derived Ø: 25.0 mm
Area: 472.9 mm²
Area Derived Ø: 24.5 mm
LVOT Ø: 23.4 mm
RCA Height: 16.4 mm
LCA Height: 12.8 mm
Sinus Of Valsalva Diameter:
Left: Ø: mm
Aortic Valve Calcification: Severe

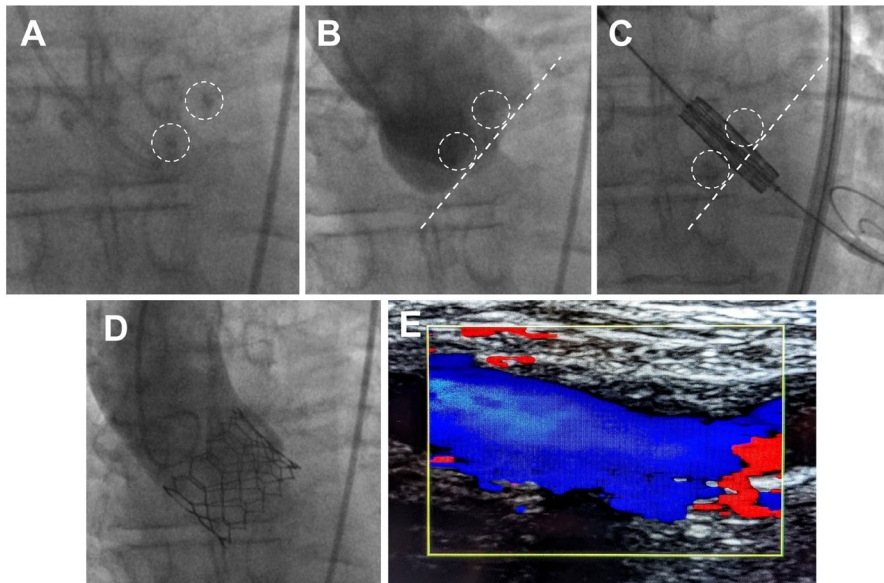
Ø 55/64 mm
Ø 59/67 mm
Ø 55/63 mm
Ø 59/111 mm
Ø 59/67 mm
Ø 55/68 mm

Plan	Sizing: Acurate M/L, 25, Portico 27/29, Evolut 29, Sapien 3 26. Access: RFA
Cautions	Horizontal aorta
Arch	Normal – suitable for CEP
Urgency	RED – TAVI within 1 month of referral (Priority 2). Should not be last on list.

Fluoroscopy
LAO4/CAU2
Aorta 67°

Clinical outcomes following single access transfemoral transcatheter aortic valve implantation

Nicholas P. Aroney MBBS, BSC¹  | Tiffany Patterson MBBS, PhD¹ |
Andreas Kalogeropoulos MD, PhD¹ | Christopher J. Allen MBBS¹ |
Harriet Hurrell MBBS¹ | Omar Chehab MBBS¹ | Julia Grapsa MD, PhD¹ |
Ronak Rajani DM^{1,2} | Bernard Prendergast DM¹ | Simon Redwood MD¹



Abstract

Objectives: We describe the first experience using calcification of anatomical landmarks to obviate the need for transcatheter aortic valve implantation (TAVI) alignment aortography and secondary TAVI access.

Background: TAVI alignment conventionally involves secondary femoral access for contrast aortography using a second catheter. Secondary femoral access accounts for up to 25% of all vascular complications. Heavily calcified aortic leaflets are often visible fluoroscopically and can act as markers for TAVI alignment.

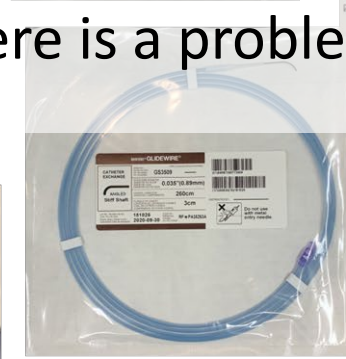
Methods: We considered 100 consecutive patients for transfemoral TAVI. The first group was considered for a conventional dual access technique and the subsequent group was considered for a single access technique. Relevant baseline, and procedural and outcome measures were recorded.

Results: Baseline characteristics were comparable between groups. Balloon-expandable transcatheter heart valves (THV) were used in all cases. THV implantation was successful in 100% of cases with no procedural or in-hospital mortality. Procedural time and contrast use were lower in the single access group.

There were no Valve Academic Research Consortium (VARC)-2 major vascular complications with the single access technique.

Conclusions: This is the first study describing the use of calcification of anatomical landmarks to obviate the need for secondary TAVI access. Notable observations included successful device implantation in all cases, no VARC-2 major vascular complications, comparable rates of paravalvular leak and permanent pacemaker requirement, shorter procedural times, and lower contrast use. Single access TAVI is a viable alternative technique to minimize vascular access, contrast use, and procedural duration in experienced centers and with selected patients, allowing successful device implantation and low complication rates while further streamlining TAVI workflow.

- Availability of equipment for up front peripheral intervention
- Being able to react to the situation
- A clear plan if there is a problem



Conclusions and take home messages

- Try to avoid own goals...
 - Ultrasound guided micropuncture for everyone
- CT analysis is important
 - To determine strategy
 - To plan bail-out options
 - Should be done by interventional cardiologists
- Have the right equipment (including IVL) available
- Trying and failing is reasonable... as long as it is safe
- 'Just push harder' – is not the answer!

A case from everyday clinical practice

86 yo man, severe AS with preserved LV ejection fraction

- Chronic anemia
- Previous right pulmonary lobectomy for adenocarcinoma
- CKD IV (eGFR 18ml/min, Serum Creatinine 2.97mg/dl)

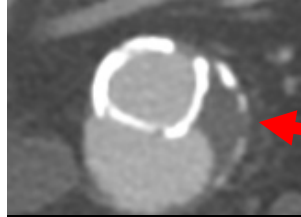
-
- ```
graph LR; PVD --> A[Bilateral subcritical carotid stenosis]; PVD --> B[Infrarenal aortic disease with indication for EVAR]; PVD --> C[Bilateral peripheral artery disease];
```
- PVD
    - Bilateral subcritical carotid stenosis
    - Infrarenal aortic disease with indication for EVAR
    - Bilateral peripheral artery disease

Current symptoms: Dyspnoea on mild effort (NYHA III)

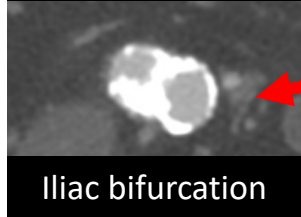
Courtesy of Dr Flavio Ribichini

# CT analysis: overview of iliac-femoral axes

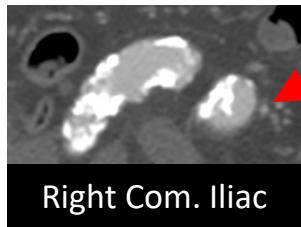
Critical sites



Descending  
aorta



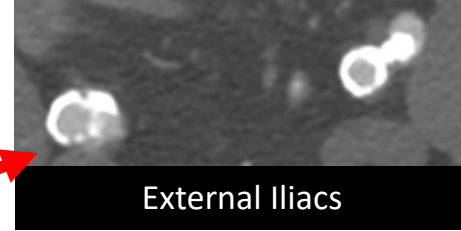
Iliac bifurcation



Right Com. Iliac



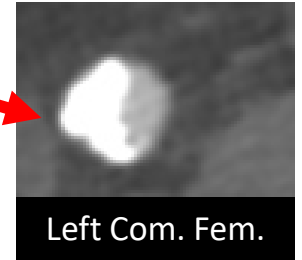
Critical sites



External Iliacs

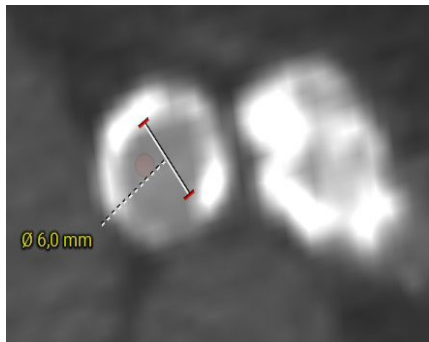
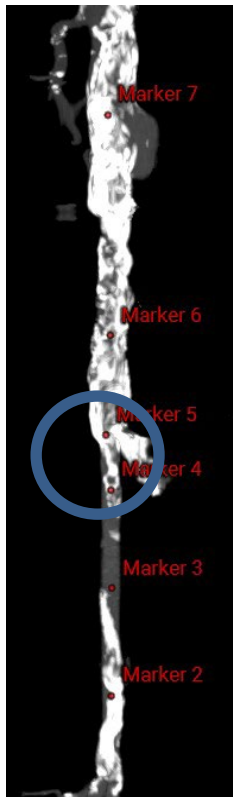


Right Com. Fem.



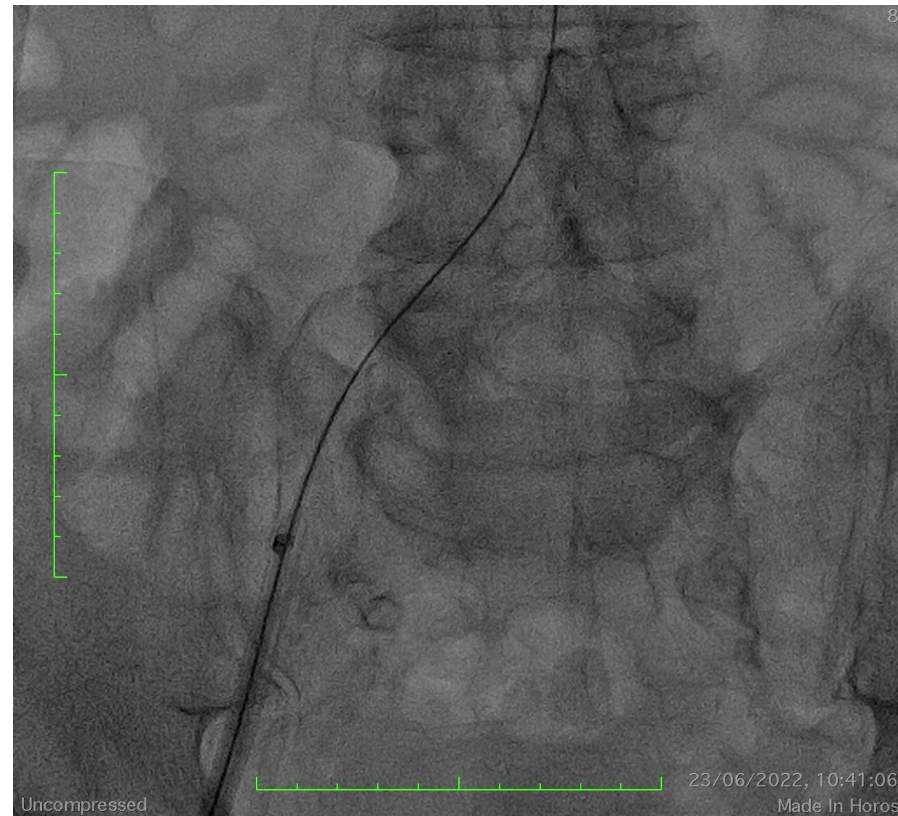
Left Com. Fem.

# Lunderquist wire + eSheath



Diameter Stenosis: **26-50%**

Calcium Arch: **181-270°**

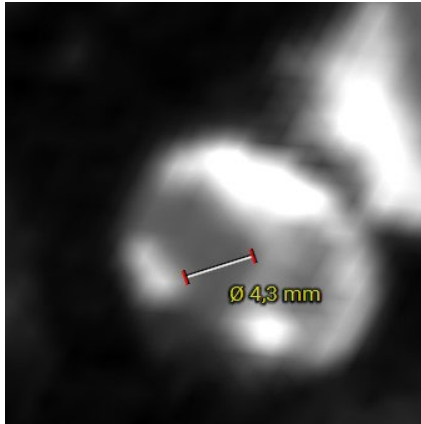
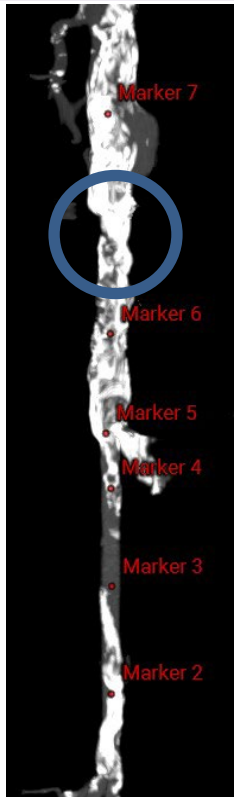




## PTA with 6mm balloon + IVL with 8x60mm SW balloon



# Further obstacle

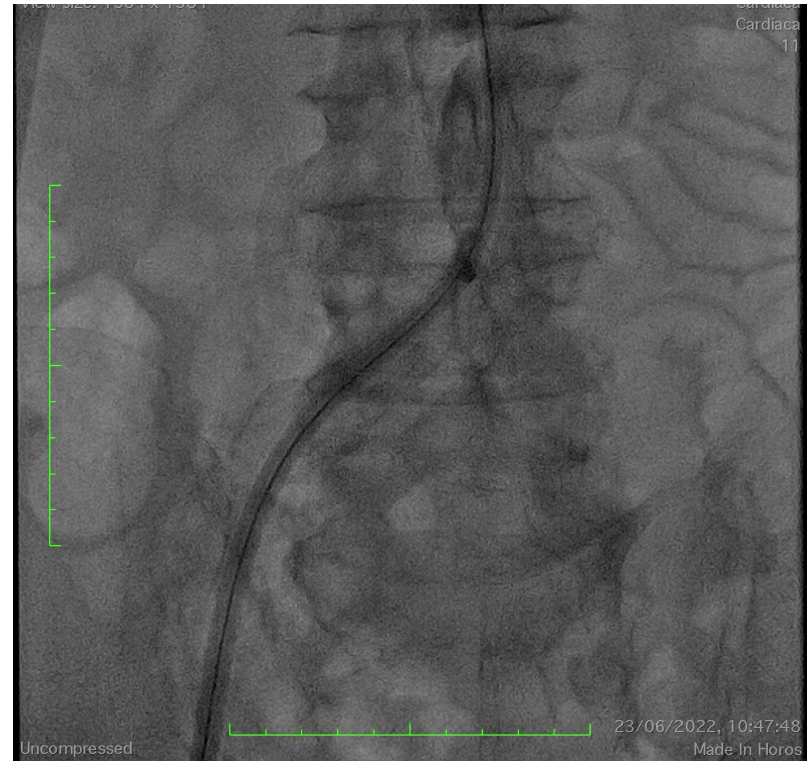


Diameter Stenosis: 51-75%

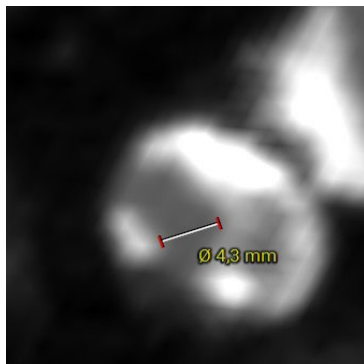
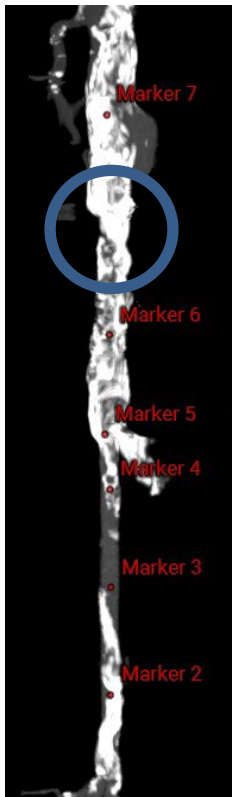
Calcium Arch: 271-360°



## Unsuccessful advancement



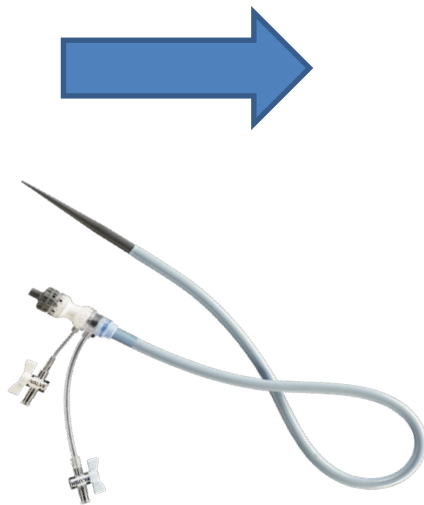
# Sheath change



Diameter Stenosis: 51-

75%

Calcium Arch: 271-360°



# Success!!

TAVI result

