# TAVR with SAPIEN Step-By-Step Streaming Procedure with "Expert Commentary"

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## Remarkable Procedural Change in ASAN Medical Center : TAVR minimalist





#### Minimal vs. Standard Approach in TF-TAVR (N=288) **Trend Over Time in AMC**



General Anesthesia --- Local Anesthesia

Year

## **TAVR Center Stage**

- Initiative Beginning Stage
   Learning Curve Stage
- 3. Experienced Stage: TAVR minimalist



#### **Contemporary TAVR Devices in Korea**

#### Sapien 3











#### Edwards Delivery System Innovation Leadership





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## **Pre-Procedural TAVR Planning**

#### Echo findings

- \* 71/F, 157 cm, 47.5 kg, BMI 19.27, BSA 1.44
- Chief complaints
  - Dyspnea (NYHA III)
- Medical history
  - ESRD s/p KT (1991), spinal stenosis, osteoporosis
  - Pericardial effusion s/p PCC (2017.3)
- ECG : paroxysmal AF with RVR
- Serum Cr : 1.48
- PFT : FEV1 0.94 (43%) / FVC 1.15 (40%) = 82%
- STS score = 3.081 %
- Euroscore I = 2.68 %, Euroscore II = 2.66 %

- Tricuspid valve
- AVA = 0.55 cm<sup>2</sup>
- Peak / Mean PG = 119 / 63 mm Hg
- V max = 5.5 m/s
- EF= 71 %
- LVOT diameter, TTE: 19.4 mm
- Severe degenerative AS
- Mild AR

Inomalous

from LCC

Pericardial effusion

#### CT findings – Aortic annulus view



Aortic Annulus parameters	
Annulus short diameter	17.7 mm
Annulus long diameter	25.4 mm
Annululs mean diameter	21.5 mm
Annulus area	353.6 mm <sup>2</sup>
Annulus area-driven diameter	21.2 mm
Annulus perimeter	68.6 mm
Annulus perimeter-driven diameter	21.9 mm

#### CT findings – Coronary Height

#### CT findings – Ileofemoral Angio

#### Sizing for Sapien 3

Areas exception

Coronary Height		
LCA	10.5 mm	
RCA	13.5 mm	



OILC	(%)	(%)
23	115.7	104.1
24	126.0	108.6
25	136.7	113.2
26	146.7	117.7
27	158.2	122.2
28	170.1	126.8
29	183.5	131.6

Perimotor ol

#### **Iliofemoral Access Screening** CTA: 3D reconstruction





#### **Vascular Access Screening**

#### **Minimum Vessel Diameter**

THV Size	Minimum Vessel Di	ameter*
23 mm	<u>&gt;</u> 5.5 mm	(14 Fr)
26 mm	<u>&gt;</u> 5.5 mm	(14 Fr)
29 mm	<u>&gt;</u> 6.0 mm	(16 Fr)











# Question: What We Should Be Cautious for Vascular Excess Screening? Tips for Early-TAVR Center?





### Alternative Access: Subclavian TAVR







Patients who received fem-fem bypass





### Alternative Access: Trans-Caval TAVR





Access site: Inferior Edge L2 body







# Question: How Do You Select TAVR approach site in Non-Transfemoral Patients? What Is Your Routine Strategy?





#### **SAPIEN 3 Valve Sizing: Confirm THV Size**

NOTE:

systolic measurements are recommended



#### NOTE:

old = recommended Sealing Zones relate only to alves that are deployed with nominal volumes

#### NOTE:

All values presented are based on nominal/recommended inflation volumes







 Question: What Is Your Sizing Tip with SAPINEN 3?
 What Is Your Strategy For Borderline Zone (i.e. Overfill or Underfill)?



#### AP VALVES 2017



## **Procedural Steps**



#### Puncture



#### 6 Fr – Pacemaker, 7 Fr – Pigtail Catheter



## LV Wire Pacing w/o RV Pacing

Catheterization and Cardiovascular Interventions 89:783-786 (2017)

ve emeritade (mV)		
/e amplitude (mv)	1.5	1-2.5
g threshold (mV)	5.5	3–12
se duration (ms)	Median 1.6	1.4-1.8
	g threshold (mV) se duration (ms)	g threshold (mV) 5.5 se duration (ms) Median 1.6

Fig. 1. The pacing clips are attached to the patient and LV support wire. [Color figure can be viewed at wileyonlinelibrary.com]





 Question: Many Operators Are Very Nervous for Pacing Failure at the Time of Inflation.
 What Is Your Strategy For Always Perfect Pacing?



## Proglide



14 Fr – 1 Proglide (23 mm, 26 mm) 16 Fr – 2 Proglides (29 mm)



#### **Baseline Aortogram: Coplanar View**











## **Edwards eSheath**







## **Wire Crossing**









# Question: Do You Have Also Experienced Wire-Crossing Failure? What Is Your Wire-Crossing Tips?





## **LV Support Wire Exchange**



## **Confida Guidewire**

#### Shaft Diameter

Shaft Material

Shaft Color

Tip Material

Flexible Tip Length

Coating

Guide Wire Length

.035" / 0.89 mm
Stainless Steel
Green
Stainless Steel
20 cm
PTFF

260 cm







## Positioning of the Wire in the LV (If Not, Pre-Shaped Wire)

- Position the loop out in the apex
- Avoid entanglement with mitral chords
- Tighten LV loop to reduce arrhythmias
- Include stiff portion of the wire into the loop to avoid nose cone injury







# Question: What Is Your Favorite LV Wire for TAVR System Support? What Is Your Strategy for Wire Selection?





### **Pre-Balloon**



#### Risk

- Embolization
- Aortic root injury
- Acute AR

#### Benefit

- Procedural stability
- Exact positioning
- Valve sizing estimation



## **New Balloon System**



#### **TRUE Flow Balloon**

- Perfusion balloon valvuloplasty system
- 8 balloon chambers linked by a fiber-based shell; continuous flow during dilatation
- Improved stability (doesn't need PM), maintained hemodynamics, and allows prolonged inflation times





# Question: What Is Your Strategy for Pre-dilation (Routinely or Not) ? If Sometimes Do, How Optional?





## Valve Mounting: Skilled Nurse







## **E-Commander: valve delivery**



AP VALVE



#### **DEM:** Dynamic Expansion mechanism

- Allows for transient sheath expansion during valve delivery
- Reduces the time the access vessel is expanded





 Question: Many Operators Usually Feel Very Hard Resistance to Push the E-Commander, Especially 26 or 29 mm, Bigger-Sized Valve.
 Is There Any Technical Tips for Easy Passing?



## **Balloon Retraction: Valve-on-Balloon**





## **Ascending Aorta and Valve Pass**





## **Pull Back Flex Catheter**





## **Making Coaxial Alignment**



#### Distal hyperflexion, push/pull of delivery system, and fine control knob allows for improved coaxial positioning of the valve



## Valve Positioning and Implantation Bottom of Center Marker at Base of Cusps





### **S3 Valve Positioning**



![](_page_40_Picture_3.jpeg)

![](_page_41_Picture_0.jpeg)

![](_page_41_Picture_2.jpeg)

#### Question: What Is Your Tips for (1) Good Co-Axial Alignment and (2) Valve Positioning?

![](_page_41_Picture_5.jpeg)

## Foreshortening During Valve Inflation Sapien 3 foreshortens more than XT

![](_page_42_Figure_1.jpeg)

# Foreshortening occurs primarily from the ventricular side

## **Final Aortogram**

![](_page_43_Picture_1.jpeg)

![](_page_43_Picture_3.jpeg)

## **PVL: Balloon Refill**

![](_page_44_Picture_1.jpeg)

#### Most Important Tip for Complication-Free TAVR

#### We Know Where to Say "NO"

![](_page_44_Picture_5.jpeg)

#### Valvular Heart Disease

#### Anatomical and Procedural Features Associated With Aortic Root Rupture During Balloon-Expandable Transcatheter Aortic Valve Replacement

Marco Barbanti, MD; Tae-Hyun Yang, MD, Josep Rodès Cabau, MD; Corrado Tamburino, MD;
David A. Wood, MD; Hasan Jilaihawi, MD; Phillip Blanke, MD; Raj R. Makkar, MD; Azeem Latib, MD; Antonio Colombo, MD; Giuseppe Tarantini, MD; Rekha Raju, MD; Ronald K. Binder, MD; Giang Nguyen, MD; Melanie Freeman, MD; Henrique B. Ribeiro, MD; Samir Kapadia, MD;
James Min, MD; Gudrun Feuchtner, MD; Ronen Gurtvich, MD; Faisal Alqoofi, MD; Marc Pelletier, MD;
Gian Paolo Ussia, MD; Massimo Napodano, MD; Fabio Sandoli de Brito, Jr, MD; Susheel Kodali, MD;
Bjarne L. Norgaard, MD; Nicolaj C. Hansson, MD; Gregor Pache, MD; Sergio J. Canovas, MD; Hongbin Zhang, PhD; Martin B. Leon, MD; John G. Webb, MD; Jonathon Leipsic, MD

- No difference in leaflet calcium
- Higher calcium in the R coronary LVOT
- No difference if small or large valve
- No difference if sinus large vs effaced
- No difference if annulus eccentric
- Annular oversizing (>20%) (OR 8.38)
- Post-dilation (same size, 1-2 mm larger)

![](_page_45_Picture_12.jpeg)

![](_page_46_Picture_0.jpeg)

![](_page_46_Picture_2.jpeg)

 Question: What Is Your Tips for PVL Management?
 Your Pre-Planned Valve Size Threshold Was Already Met (i.e. 20% Oversizing). However, PVL Seems To Be Significant. How Do You Do?

![](_page_46_Picture_5.jpeg)

## Final hemodynamics Do or Don't Do

![](_page_47_Figure_1.jpeg)

Rough

Value

40s

30s

20s

10s

20

![](_page_48_Picture_0.jpeg)

![](_page_48_Picture_2.jpeg)

# Question: What Is Your Routine Final Step After Successful Valve Deployment? Do or Don't Do Final Hemodynamics?

![](_page_48_Picture_5.jpeg)

## **Completion Angiogram and Sheath Removal**

![](_page_49_Picture_1.jpeg)

![](_page_49_Picture_3.jpeg)

#### Large Hole Vascular Closure (novel technologies)

![](_page_50_Picture_1.jpeg)

#### MANTA Collagen seal with footplate and footplate (14 and 18 Fr) losure

 Large hole vascular closure is an integral component of the transfemoral TAVR procedure

 Safety concerns are "moderate" – early and late – requiring reasonable demonstration of device performance in observational registries with 30-90 day clinical follow-up

# **TAVR with SAPIEN**

- SAPIEN is a one of mainstream TAVR valves.
- More intuitive TAVR system by the interventional cardiologist.
- There is a growing array of support wires, TAVR sheaths and special access devices and techniques.
- Careful review of the patient anatomy with 3D imaging, especially CTA, allows for careful planning of the best procedural approach.
- Procedural efficacy: pre-TAVR planning and techniques
- Procedural safety: Pre-expect and When to Say No

#### AP VALVES 2017 Al Tips "Experience Improves Outcomes"

#### **Procedural Experience and TAVR Outcomes**

#### 42,988 commercial procedures at 395 hospitals from the STS/ACC TVT registry

![](_page_52_Figure_2.jpeg)

AP VALVES 2017

#### Carroll JD, J Am Coll Cardiol 2017;70:29-41

![](_page_52_Picture_5.jpeg)

#### **Key Step for Successful TAVR with SAPIEN**

![](_page_53_Figure_1.jpeg)

![](_page_53_Picture_3.jpeg)

![](_page_54_Picture_0.jpeg)

![](_page_54_Picture_2.jpeg)

#### Question: Final Expert Lessons for Early- or Midterm-Careered TAVR Centers

![](_page_54_Picture_4.jpeg)

![](_page_54_Picture_5.jpeg)