MHIF FEATURED STUDY:

Half Moon

Enrolling now!

EPIC message: *Research MHIF Patient Referral*

CONDITION:	PI:	RESEARCH CONTACT:	SPONSOR:
Moderately severe or severe MR	Paul Sorajja, MD	Sara Olson Sara.Olson@allina.com | 612-863-7601	Half Moon Medical

DESCRIPTION:

Purpose: to **evaluate the safety and performance of the Half Moon Transcatheter Mitral Valve Repair (TMVr) system in patients with severe, symptomatic mitral regurgitation, who are at high risk for conventional mitral valve surgery**

Primary endpoint: survival, free of stroke and any cardiovascular hospitalization at 5 years; MR ≤ mild at 30 days; QOL improvement at 5 years compared to baseline; hospital length of stay; rate of mitral valve replacement at index procedure

CRITERIA LIST/ QUALIFICATIONS:

Inclusion: moderately severe or severe MR; symptomatic NHYA class II, III, or IV; high risk for mitral valve surgery; suitable anatomy for transfemoral transeptal access

Exclusion: LVEF <25%; Severe MAC, severe TR, anterior flail or prolapse; valve anatomy which would preclude reducing MR to mild or less; severe RV dysfunction

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MHIF FEATURED STUDY:

REPAIR-MR

Enrolling now!

EPIC message: *Research MHIF Patient Referral*

CONDITION:	PI:	RESEARCH CONTACT:	SPONSOR:
Severe primary MR who are at moderate surgical risk	Paul Sorajja, MD	Jane Fox Jane.fox@allina.com | 612-863-6289	Abbott

DESCRIPTION:

Purpose: to **compare the clinical outcome of MitraClip™ device versus open surgical repair in patients with severe primary MR who are at moderate surgical risk.**

Primary endpoint: survival, free of stroke and any cardiovascular hospitalization at 2 years; MR ≤ mild at 30 days; QOL improvement of at least 5 points at 2 years compared to baseline; hospital length of stay; rate of mitral valve replacement at index procedure

CRITERIA LIST/ QUALIFICATIONS:

Inclusion: severe primary MR (Grade III or greater mitral regurgitation mixed etiology is acceptable if principal mechanism is a degenerative mitral valve); symptomatic NHYA class II, III, or asymptomatic with EF ≤ 60%, PAS >50 mm HG, or LVESD >40 mm; 75 years or if < 75 years subject with STS predicted risk of mortality repair score >2%, or presence of comorbidities

Exclusion: ischemic or non-ischemic secondary MR; EF <30%; severe TR; severe annular calcification; valve anatomy which would preclude reducing MR to mild or less

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MHIF FEATURED STUDY:

TAVR UNLOAD

Coming soon!

EPIC message: *Research MHIF Patient Referral*

CONDITION:	PI:	RESEARCH CONTACT:	SPONSOR:
Moderate AS & HF w/ EF <50%	Santiago Garcia, MD	Jennifer Nguyen Jennifer.Nguyen@allina.com | 612-863-9291	Cardiovascular Research Foundation

DESCRIPTION:

A multi-center, randomized, open-label, clinical trial comparing the safety and efficacy of TAVR with the Edwards S3 & S3 Ultra and optimal HF treatment *versus* optimal HF treatment alone in HF patients with moderate AS.

CRITERIA LIST/ QUALIFICATIONS:

Inclusion: Moderate AS; LVEF <50%; NYHA ≥II; NT-proBNP > 900 pg/ML (or BNP >200 pg/mL) *or* HF hospitalization within 2 years

Exclusion: EF <20%; severe AI or MR; unicuspid/bicuspid aortic valve; severe RV dysfunction; valve anatomy without minimum calcification necessary

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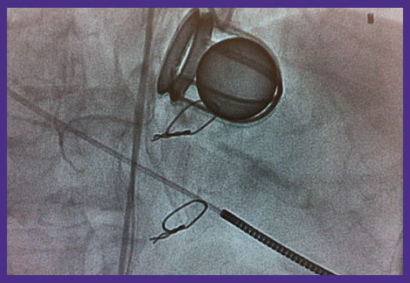

Journey with transcatheter valves

Vinayak Bapat, *MBBS, MS, DNB, FRCS, FRCS.CTh*

Researcher, Valve Science Center, Minneapolis Heart Institute Foundation

Cardiac Surgeon and Chair of Cardiothoracic Surgery
Minneapolis Heart Institute®

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Disclosures

- Consultant / Honorarium / Grants/Advisory board
  - Edwards Lifesciences
  - Medtronic Inc
  - Boston Scientific
  - Abbott St Jude
  - 4C
  - Admedus
  - Cardiomech

5

Beginnings

King Edward Memorial Hospital, Mumbai

- One of the first heart centers in India
- First heart transplant 1969
- Snake Heart operation
- Rockefellar Foundation collaboration

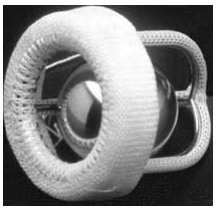
1986- 1998
Medical school- General Surgery- CVTS
12 Publications
Thesis in Valve replacement in young children <12

6

Journey – Mechanical valve

The original Starr-Edwards mitral valve, implanted 1960. Lucite cage, Silastic rubber ball occluder.

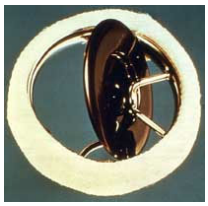
Starr-Edwards Model 1260 introduced 1968. Teflon and polypropylene sewing ring, cast Stellite 21 cage. Still in use.



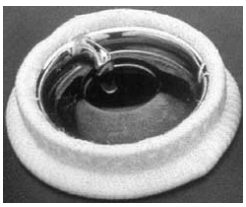
Starr-Edwards 2400 introduced 1972. Hollow Stellite ball, cloth covered Stellite cage. Discontinued 1980.

7

Tilting Disc



Bjork-Shiley



Bjork-Shiley Monostrut

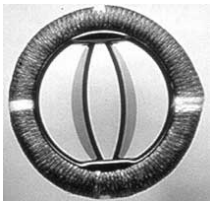
Chitra TTK

Medtronic Hall tilting disc

8

Bileaflet valves

St. Jude Medical



Sorin

On-x

Carbomedics

Edwards-Duromedics

9

Ideal Heart Valve – Ten Commandments

1. Should not block blood flow
2. Closes promptly and completely
3. Nonthrombogenic
4. Resists infection
5. Chemically inert
6. Does not kill cells
7. Easy to permanently implant
8. Allows healing to occur
9. Pleasing to the patient (noise free)
10. Last for a life time

Does not exist

10

Canada and UK

- Toronto General Hospital

1999

Fellowship in adult and adult congenital

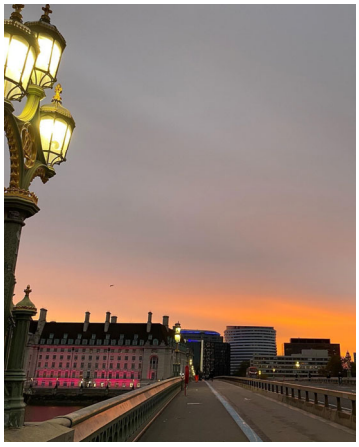
- Guys and St. Thomas' hospital

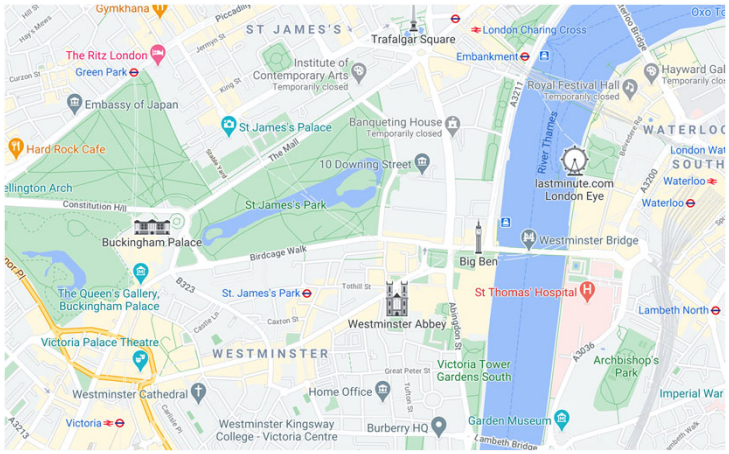
2000-2006

National training in UK

11

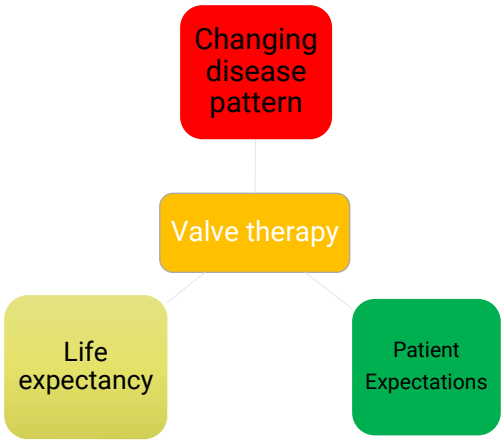
St. Thomas' Hospital, London - 2007





12

Heart Valve therapy has to evolve



13

TAVR beginnings

14

TAVR changed the landscape

- Way we think and practice cardiac medicine
- Indications broadened – novel applications
- Options bring challenges !

15

This affected all of us

- 2007 – Young attending in Guys and St Thomas' London
- Focus on Aortic Surgery
- TAVR concept was introduced

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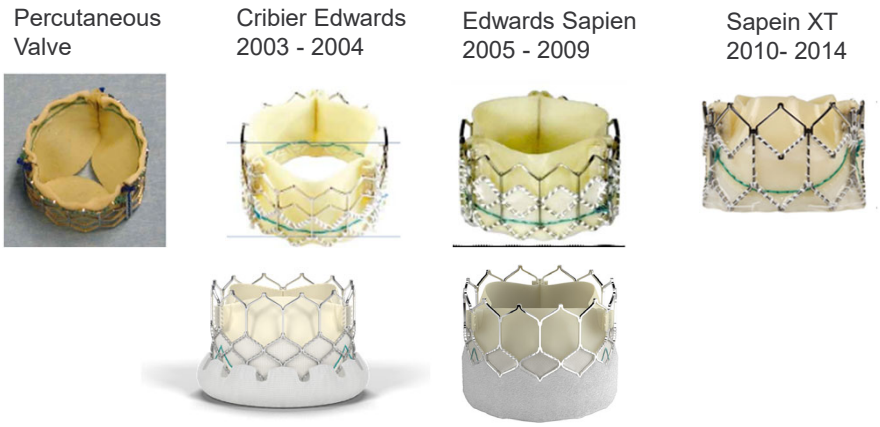
From PVT to S3……..



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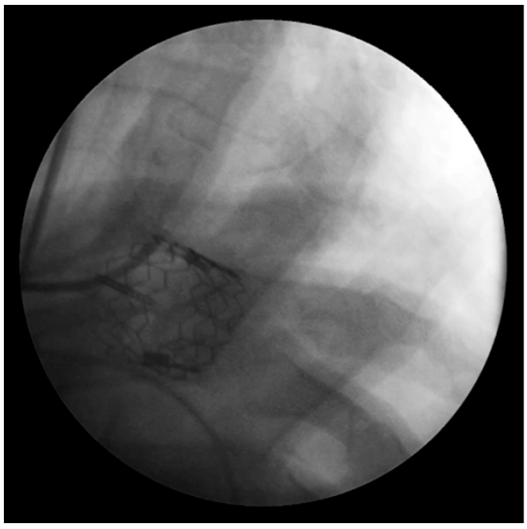

Days of
Embolisations
Leaks
Vascular complications
Apical ruptures
Arrests on table
Mitral valve injuries
Etc……

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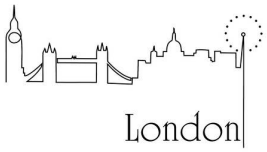
Cardiology Perspective
Very exciting !!

Cardiac Surgery Perspective
Are You Serious!!



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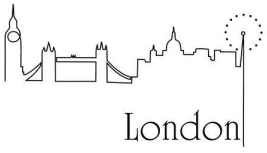
Heart Team Selection in 2007, London

- Experienced Cardiologist
- Experienced Surgeons

Include Vinnie as
1. He is young and has lot of energy
2. We need someone to run around to sort out logistics
3. These patients wont survive anyway



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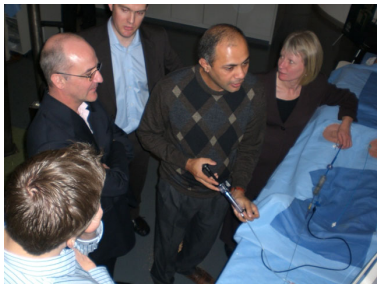
Training 2007 December

1. Team
2. Business plan for 20 cases for 2008
3. Training – Cardioskills lab in Frankfurt
4. Cases



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Cases-timeline

- I slept very well as I was supposed to assist
- In the morning the Senior Surgeon called to say he wont join!
- Proctor had himself done 4 cases only and was more tense than me!
- The case went well !

- Second case two weeks later the Proctor got stuck in traffic and patient became unstable!
- I did the case independently
- I went ahead to teach the other surgeon in our next 2 TA cases

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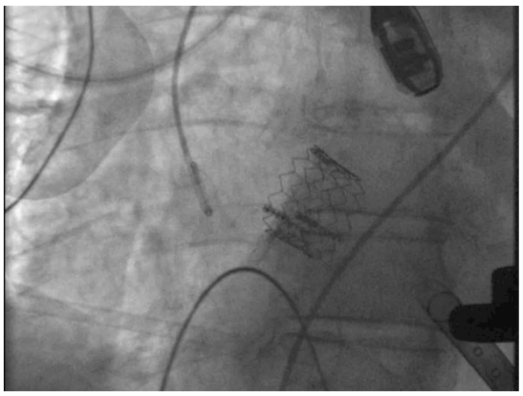
This was the beginning of an incredible journey

- TCT 2008 Live case TA SAPIEN Ascendra 1
- I got introduced to the leaders in TAVR (Physicians and Industry leadership)

23

Humbling experience

- New therapy
- Inexperience
- Think on the go!



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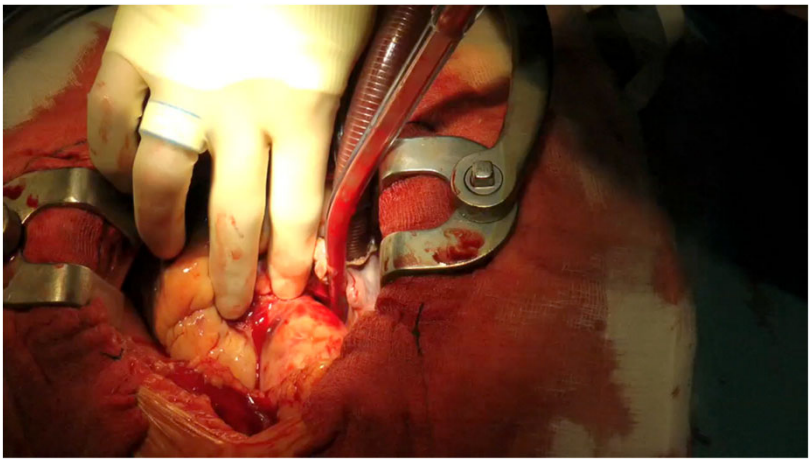


25

But I learnt slowly that…..

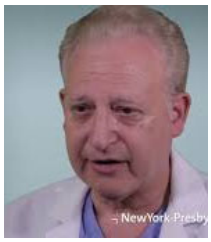
Cardiology Community doesn't mind sharing complications !

26

3M

Martyn Thomas

Mike Mack



Martin Leon

27

Innovation and research followed

- TAo approach
- Valve-in-Valve
- Crossing valve without BAV
- Valve Designs
- TMVR
- LVOT obstruction in TMVR
- TAVR in MAC
- Commissural alignment in TAVR
- TTVR

Concept of TAVR proof surgical procedures

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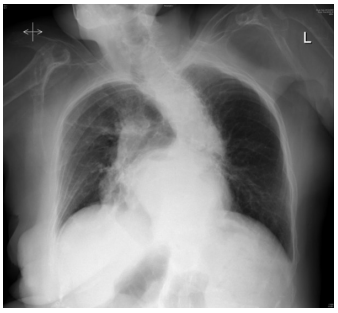
TAo – case 1

- 88 years old woman
- Severe kyphoscoliosis
- Poor lung function
- Severe aortic stenosis, Annulus 20mm
- Tortuous Aorta & small calibre Iliacs



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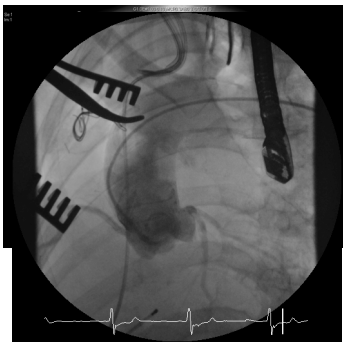
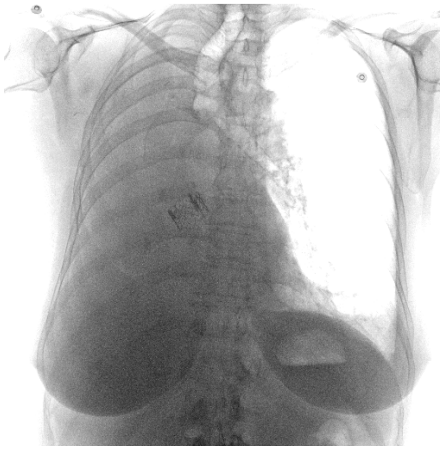
Case 7

- Right Pneumonectomy
- COPD, FEV1 – 1.04
- Severe AS, PG 104mm
- Small caliber femoral
- Surgical turn down





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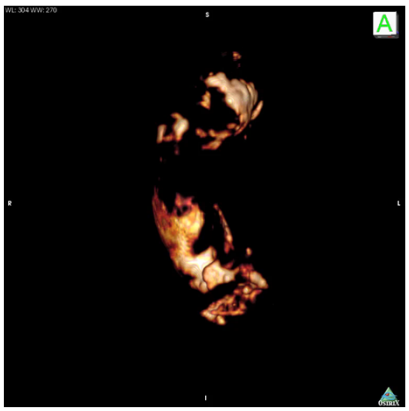
African Safari & Dr. Spencer King

December 2011
South Africa



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TAo Zone and Use of CT

Myth of Porcelain and aorta and TAo-TAVR

› JACC Cardiovasc Interv. 2012 May;5(5):470-476. doi: 10.1016/j.jcin.2012.03.006.

Distribution of calcium in the ascending aorta in patients undergoing transcatheter aortic valve implantation and its relevance to the transaortic approach

Vinayak N Bapat [1], Rizwan Q Attia [2], Martyn Thomas [1]

Affiliations + expand

PMID: 22625183 DOI: 10.1016/j.jcin.2012.03.006

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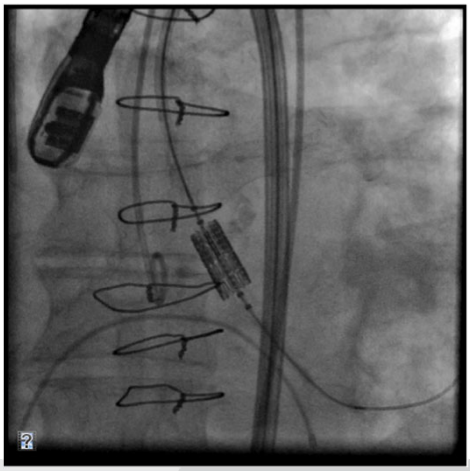
Trans femoral Delivery

- RF1 – No Nosecone

Large sheath 24 Fr



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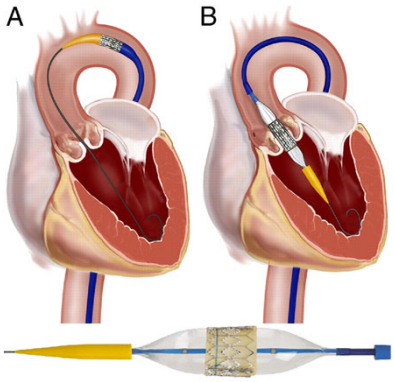
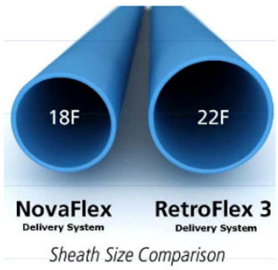
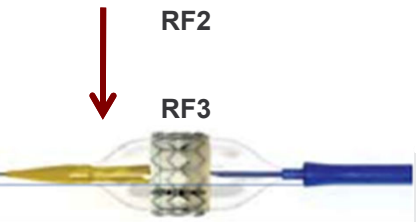


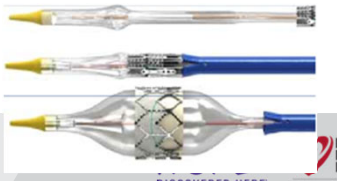
Modifications



Sheath Size Comparison



Novoflex



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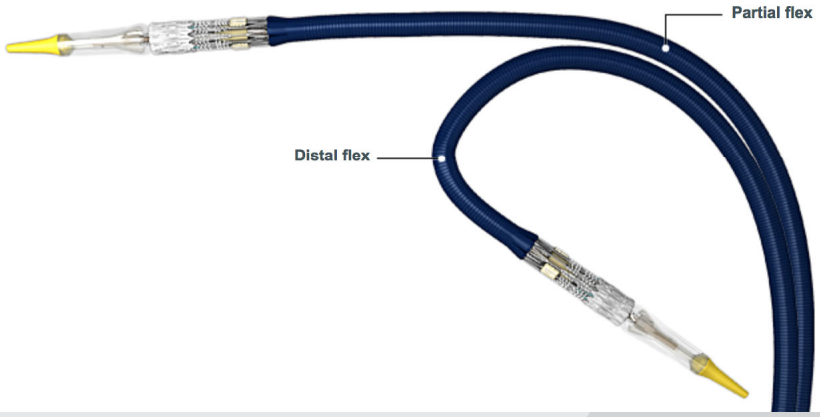
Commander delivery system for S3

Dual articulation for coaxiality even in challenging anatomies



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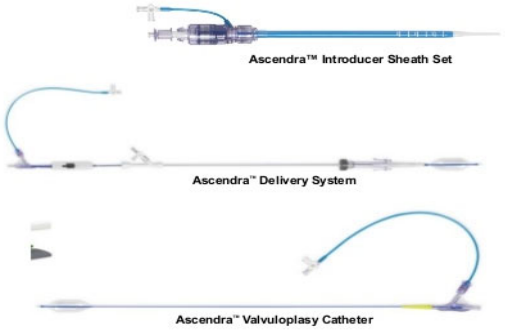
Ikea Method of using Ascendra 1



Started training other centers

Developed better understanding of Echo sizing, Cathlab working

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Surgeon Friendly system !

- **Greater hemostatic control**
- **Single-handed push button operation**

Slider Cap –
Pusher Movement

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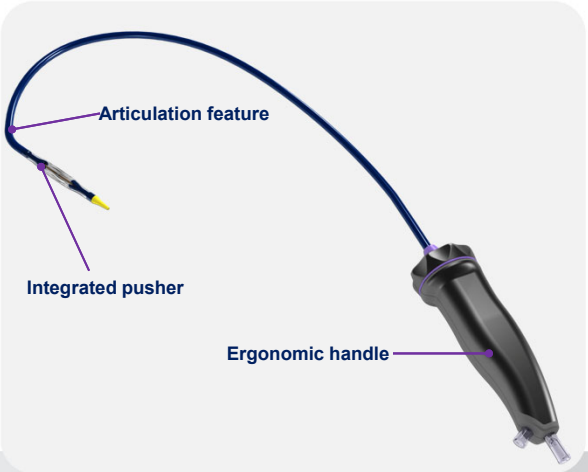
Certitude delivery system: TA and TAo approaches



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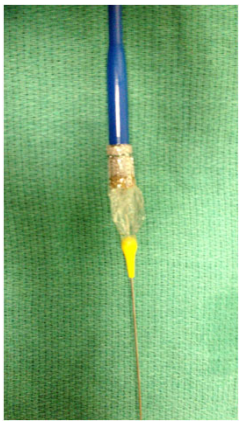
No BAV 2012-2013



First Live case
No BAV retrograde TF
TCT 2013

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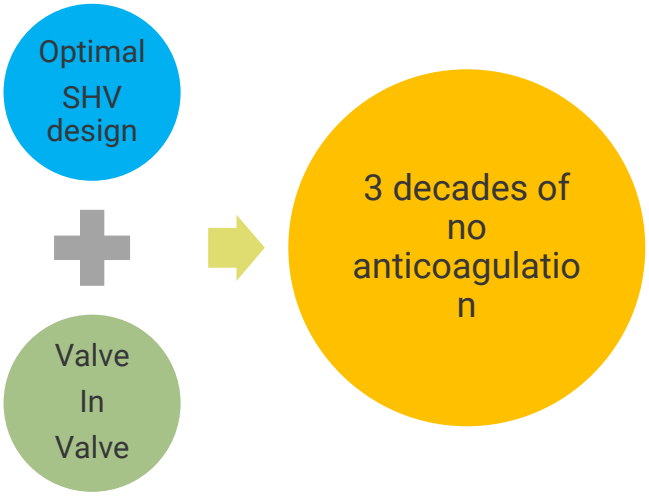
Expanding Indications



40

Why not use it to treat failed surgical valves

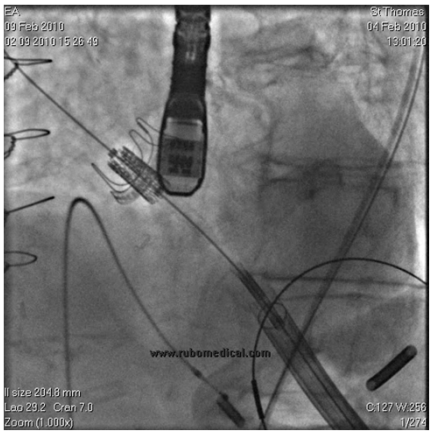
Circular shape
Perfect anchoring
Good visualization under Xray

41

VIV

Avoids redo operation
- Less trauma
- Faster recovery

Easier Procedure
- Less/no contrast
- Near Perfect Implant zone



Early results were hit and miss

42

Reason for that was simple

Lack of knowledge
Lack of information
Rapidly evolving field

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Creating a world without heart and vascular disease

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Valve-in-Valve

- Started as a distraction from TAo
- Wall charts and image bank

Bioprosthetic Aortic Valves Dimensions (Dimensions in mm)

Label Size	Valve Model	Stent Internal Diameter (ID)	Stent Outer Diameter (OD)	External Sewing Ring Diameter (ED)	Profile Height
19	Perimount	18	19	26	14
	Magna	18	19	24	14
	Magna Ease	18	19	24	13
	Mosaic	17.5	19	25	12.3
	Hancock II	NA	NA	NA	NA
	Mosaic Ultra	17.5	19	24	13.5
	Hancock II Ultra	NA	NA	NA	NA
	Epic / Biocor	NA	NA	NA	NA
	Epic Supra / Biocor Supra	19	19	NC	14
	Trifecta	NC	19	24	15
	Mitroflow	15.4	18.6	21	11
	Solo	17.5	21	25	11.5
	Soprano (size 18)	17.5	21	25	13
	Soprano Armonia (size 18)	17.8	21	25	12
21	Perimount	20	21	29	15
	Magna	20	21	26	15
	Magna Ease	20	21	26	14
	Mosaic / Hancock II	18.5	21	27	15
	Mosaic Ultra / Hancock II Ultra	18.5	21	26	15
	Epic / Biocor	19	21	NC	14
	Epic supra / biocor supra	21	21	NC	15
	Trifecta	19	21	26	16
	Mitroflow	19.3	20.7	23	15
	Solo	NA	23	23	13.5
	Soprano (size 20)	19.8	23	28	14
	Soprano Armonia (size 20)	19.8	23	27	14
23	Perimount	22	23	31	16
	Magna	22	23	28	16
	Magna Ease	22	23	28	15
	Mosaic / Hancock II	20.5	23	30	16
	Mosaic Ultra / Hancock II Ultra	20.5	23	28	16
	Epic / Biocor	21	23	NC	15
	Epic Supra / Biocor Supra	23	23	NC	16
	Trifecta	NC	23	28	17
	Mitroflow	19	22.7	26	14
	Solo	21.5	25	29	20.5
	Soprano (size 22)	21.7	25	29	15
	Soprano Armonia (size 22)	21.7	25	29	15
25	Perimount	24	25	33	17
	Magna	24	25	30	17
	Magna Ease	24	25	30	16
	Mosaic / Hancock II	22.5	25	33	17.5
	Mosaic Ultra / Hancock II Ultra	22.5	25	30	17.5
	Epic / Biocor	23	25	NC	16
	Epic Supra	25	25	NC	17
	Trifecta	NC	25	31	18
	Mitroflow	23	25.1	29	15
	Solo	24	27	32	16
	Soprano (size 24)	23.7	27	32	16
	Soprano Armonia (size 24)	23.7	27	31	16
27	Perimount	26	27	35	18
	Magna	26	27	32	18
	Magna Ease	26	27	32	17
	Mosaic / Hancock II	24	27	36	18.5
	Mosaic Ultra / Hancock II Ultra	24	27	32	18.5
	Epic / Biocor	25	27	NC	17
	Epic Supra	27	27	NC	19
	Trifecta	NC	27	33	19
	Mitroflow	22.9	27.3	31	17
	Solo	26.5	29	35	23.5
	Soprano (size 26)	25.6	29	35	18
	Soprano Armonia (size 26)	25.6	29	34	18
29	Perimount	28	29	37	19
	Magna	28	29	34	19
	Magna Ease	28	29	34	18
	Mosaic / Hancock II	26	29	39	20
	Mosaic Ultra / Hancock II Ultra	26	29	34	20
	Epic / Biocor	27	29	NC	19
	Epic Supra	NA	NA	NA	NA
	Trifecta	NC	29	35	20
	Mitroflow	24.7	29.5	33	16
	Solo	NA	NA	NA	NA
	Soprano (size 28)	27.6	31	38	19
	Soprano Armonia (size 28)	27.6	31	36	19

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First publication

Catheterization and Cardiovascular Interventions 00:000–000 (2012)

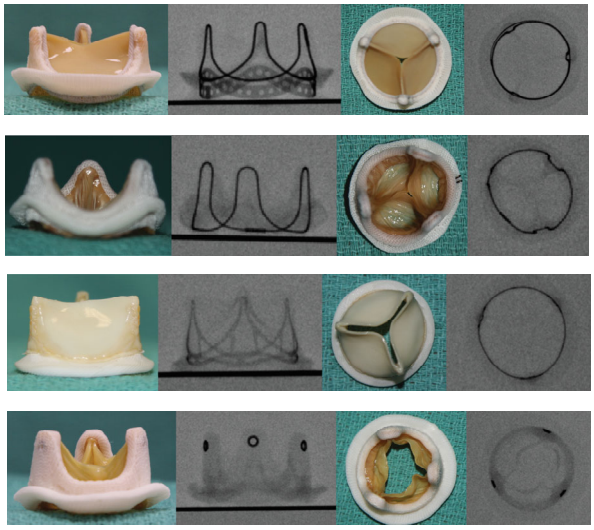
Original Studies

A Guide to Fluoroscopic Identification and Design of Bioprosthetic Valves: A Reference for Valve-in-Valve Procedure

Vinayak Bapat,* Izanne Mydin, Sucharitha Chadalavada, Hassan Tehrani, Rizwan Attia, and Martyn Thomas

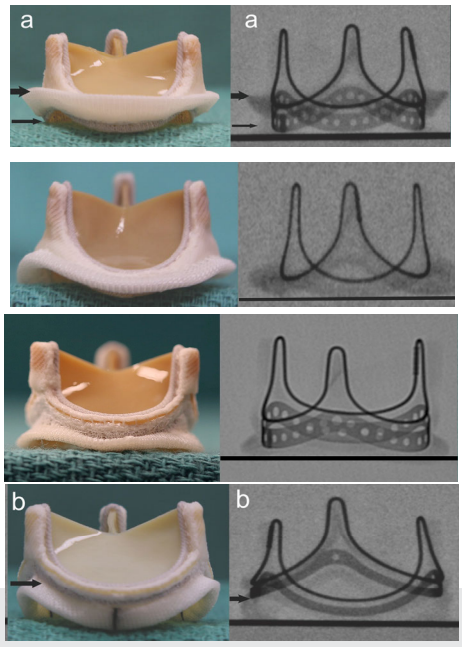
45

Each Surgical valve is unique



Appearance
Sizes
Dimensions
Compatibility
Risk of complications

46



Perimount

Perimount 2700

Magna

Magna Ease

47

Second publication

MINI-FOCUS: STRUCTURAL
State-of-the-Art Paper

Effect of Valve Design on the Stent Internal Diameter of a Bioprosthetic Valve

A Concept of True Internal Diameter and Its Implications for the Valve-in-Valve Procedure

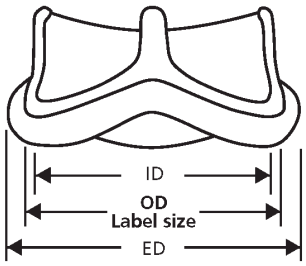
Vinayak N. Bapat, MD, Rizwan Attia, MD, Martyn Thomas, MD

London, United Kingdom

48

Surgical valve dimensions – confusion!

- To choose the right size of TAVI device



49

Surgical Valve size

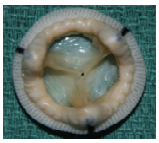
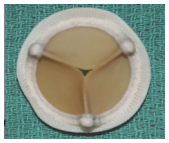
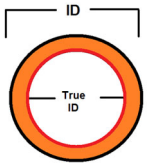
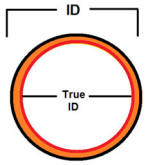
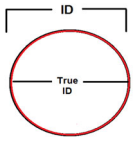
Label size does not mean same ID

Valve	Nominal size	Stent ID	True ID
Aspire	25	23	21
CE Standard	25	23	21
Mitroflow	25	21	21
Perimount	25	24	23
Trifecta	25	23	22

True ID = Stent ID- reduction due to leaflet tissue

50

3 Types of Valves – different dimensions, **True ID**

Porcine Leaflets Mounted inside	Pericardial Leaflets Mounted inside	Pericardial Leaflets Mounted outside
		
		
True ID = Stent ID – 2mm	**True ID = Stent ID – 1mm**	**Stent ID = True ID**

Term now Used in ISO standards

51

Issues with non ideal placement

- Too high: embolise
- Too low: higher gradients and sub optimal function

52

Third publication

JACC: CARDIOVASCULAR INTERVENTIONS
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PUBLISHED BY ELSEVIER INC.

VOL. ■, NO. ■, 2013
ISSN 1936-8798/$36.00
http://dx.doi.org/10.1016/j.jcin.2013.05.020

Fluoroscopic Guide to an Ideal Implant Position for Sapien XT and CoreValve During a Valve-in-Valve Procedure

Vinnie N. Bapat, FRCS, Rizwan Q. Attia, MRCS, Fortunata Condemi, MD, Ravi Visagan, MBBS, Maya Guthrie, BSc, Shelina Sunni, BSc, Martyn Thomas, FRCP

London, United Kingdom

53

Ideal Implant definition

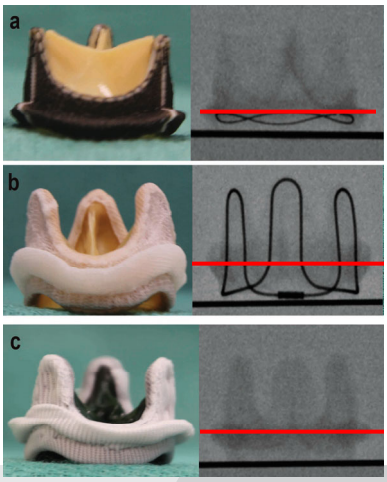
Position where we get the

1. Best hemodynamics, and
2. Secure position

54

Where is the sewing ring?

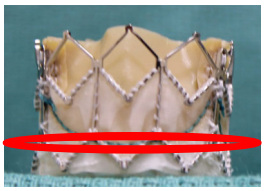
- Fluoroscopy
  - Sewing ring marker
  - Stent frame marker
  - No marker



55

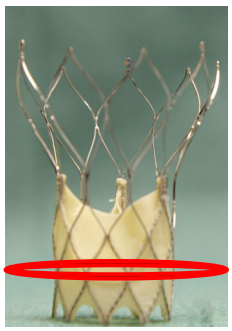
Ideal Position

- With Reference to the Neo-annulus = **Sewing ring**



Sapien
15%

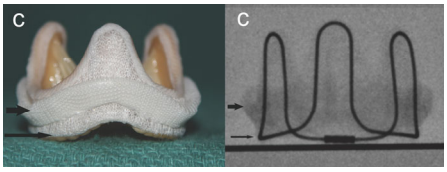
CoreValve
4mm

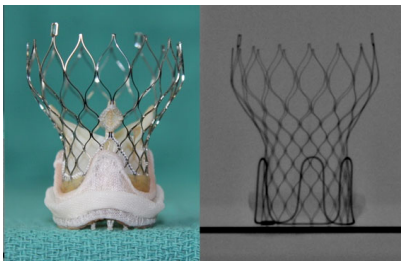


Portico
4mm

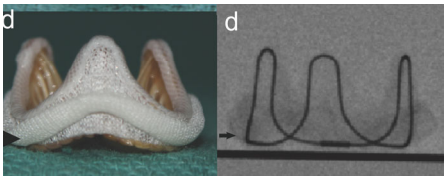
56

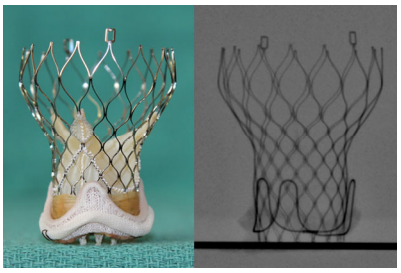
CE Porcine valve





CE SAV





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Is sewing ring is the narrowest diameter?

> Catheter Cardiovasc Interv. 2015 Mar;85(4):685-91. doi: 10.1002/ccd.25586. Epub 2014 Jul 25.

Neo-annulus: a reference plane in a surgical heart valve to facilitate a valve-in-valve procedure

Vinayak Bapat [1], Benjamin Adams, Rizwan Attia, Alia Noorani, Martyn Thomas

Affiliations + expand

PMID: 24975664 DOI: 10.1002/ccd.25586

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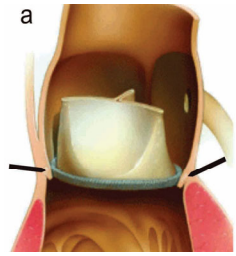
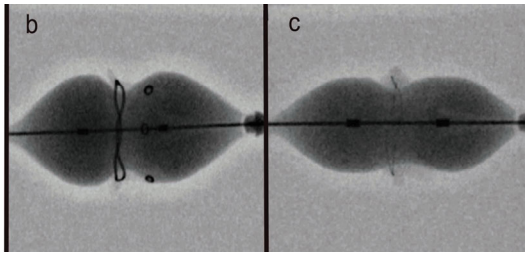
Defining the Neo-annulus to optimize 'Ideal position'

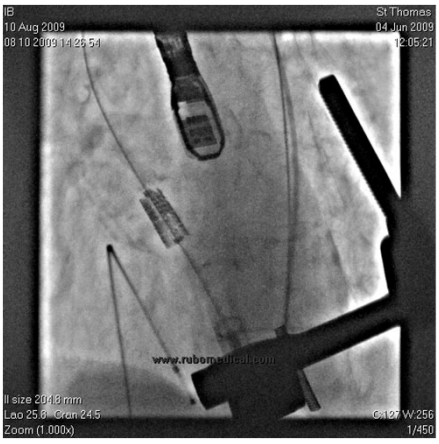




Hancock 2 Biocor/Epic

59

VIV stentless – first publication



> J Thorac Cardiovasc Surg. 2014 Sep;148(3):917-22; discussion 922-4.
doi: 10.1016/j.jtcvs.2014.05.029. Epub 2014 May 16.

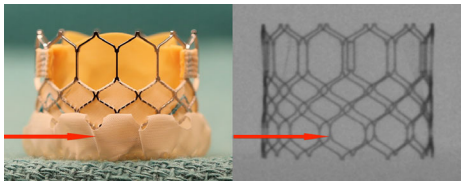
Use of balloon expandable transcatheter valves for valve-in-valve implantation in patients with degenerative stentless aortic bioprostheses: Technical considerations and results

Vinayak Bapat [1], William Davies [2], Rizwan Attia [2], Jane Hancock [2], Kirsty Bolter [2], Christopher Young [2], Simon Redwood [2], Martyn Thomas [2]

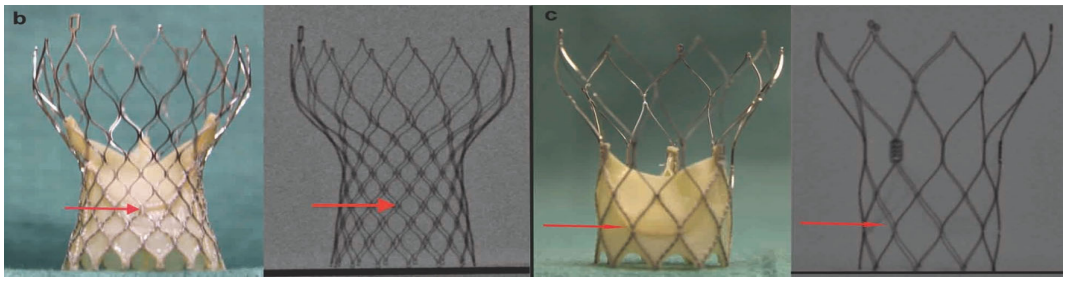
Affiliations + expand

PMID: 25037622 DOI: 10.1016/j.jtcvs.2014.05.029

60



Each Transcatheter Valve is also unique



61

Dissemination of information …

- Lacking
- Information was available but not readily

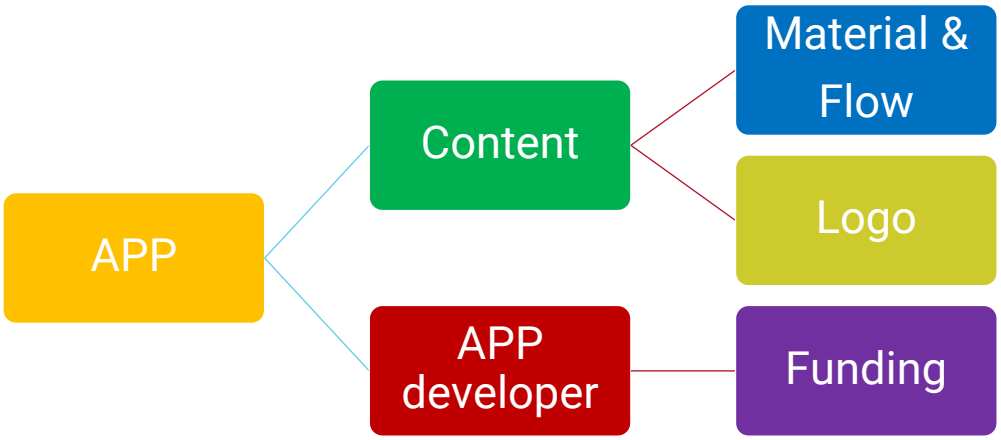
- Charts
- Publications
- Emails

62

Birth of the Valve in Valve App

63

App build



64

Funding and challenges

Development cost

Photography

Artwork

Logo and color schemes

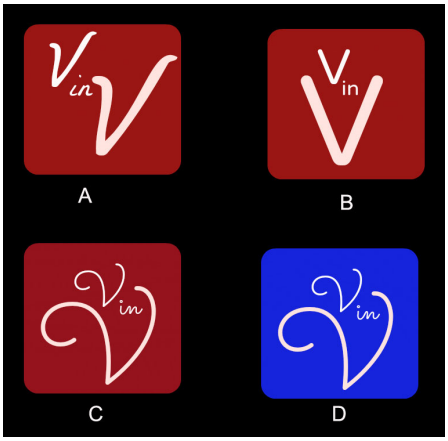
Heart Valves**

Time !

APP is free and with unbiased content

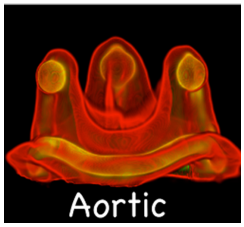
65

Logo !



66

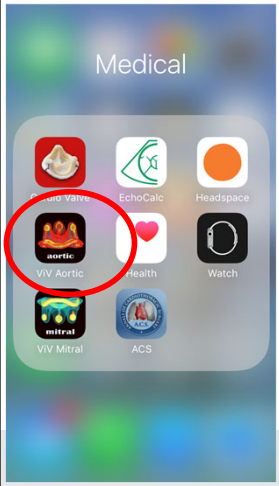
Current Logo – VIV aortic

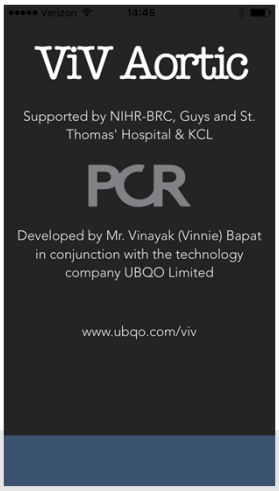


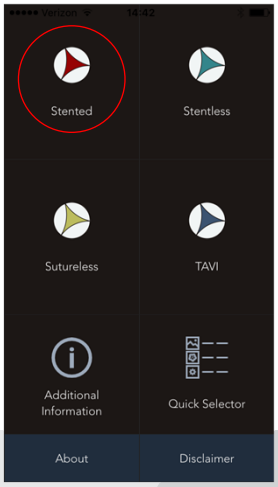
3D reconstruction of a CT scan of the Hancock 2
On Osirix

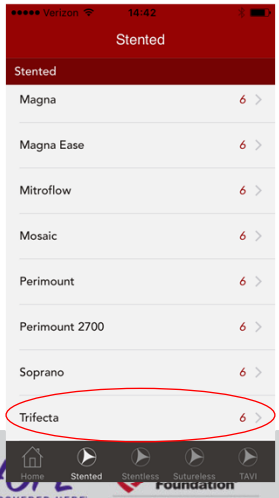
67

How to use the App to plan the procedure

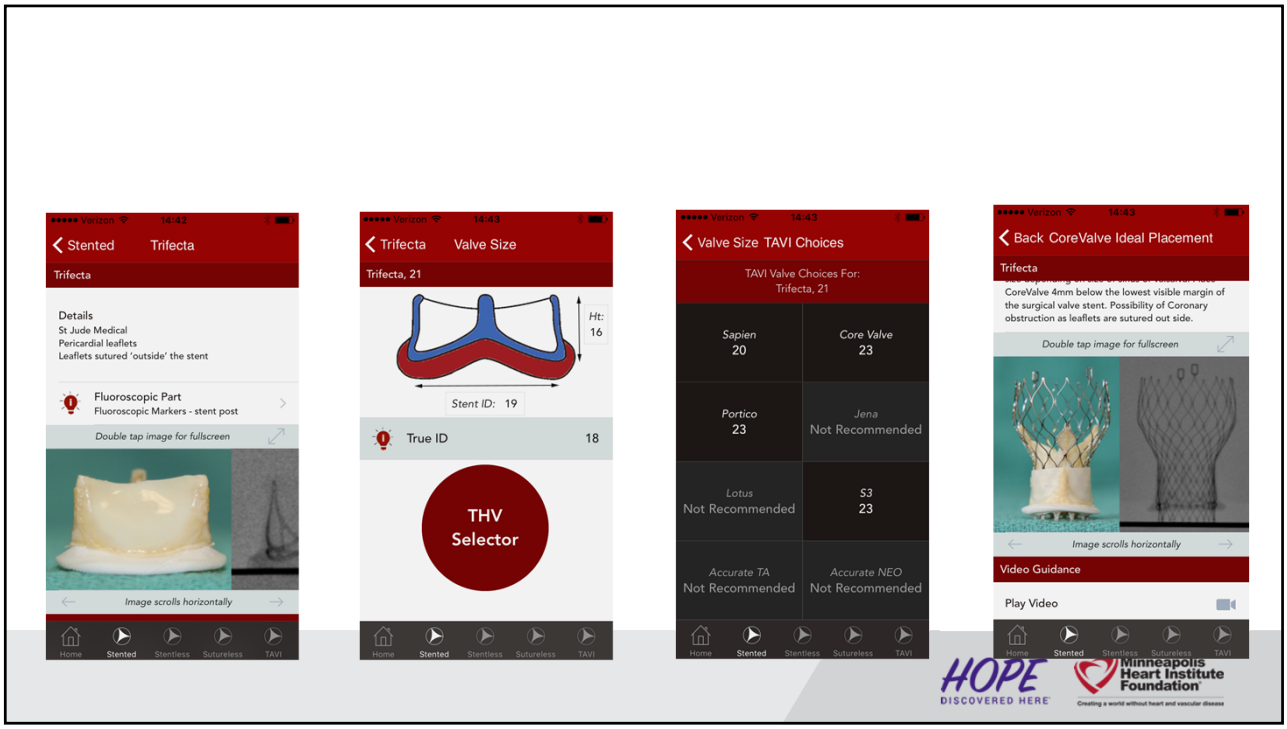








68


Stented
Trifecta
Details
St Jude Medical
Pericardial leaflets
Leaflets sutured 'outside' the stent
Fluoroscopic Part
Fluoroscopic Markers - stent post
Double tap image for fullscreen
Image scrolls horizontally
Trifecta
Valve Size
Trifecta, 21
Ht: 16
Stent ID: 19
True ID 18
THV Selector
Valve Size TAVI Choices
TAVI Valve Choices For: Trifecta, 21
Sapien 20
Core Valve 23
Portico 23
Jena Not Recommended
Lotus Not Recommended
S3 23
Accurate TA Not Recommended
Accurate NEO Not Recommended
Back CoreValve Ideal Placement
Trifecta
CoreValve 4mm below the lowest visible margin of the surgical valve stent. Possibility of Coronary obstruction as leaflets are sutured out side.
Double tap image for fullscreen
Image scrolls horizontally
Video Guidance
Play Video
Home
Stented
Stentless
Sutureless
TAVI
HOPE
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Back Sapien Ideal Placement
Trifecta
Sapien Ideal Placement
Sapien 15% below the lowest visible margin of the surgical valve stent. Possibility of Coronary obstruction as leaflets are sutured out side.
Double tap image for fullscreen
Image scrolls horizontally
Video Guidance
Video Not Available
Back Quick Selector
Choose a valve
Toronto SPV Root
Trifecta
19
21
23
Details
True ID 18
Stent ID 19
Height 16
THV Selector
Back Additional Information
Unknown valve type
Identify valves using X-ray images
Similar Looking Valves
Differentiate valves using X-ray images
Fluoroscopic Classification
Classification for understanding ViV
True ID
Explanation of the True ID measurement
Stentless Valves Tricks
Challenges in stentless valves
Additional Information
How to use the app
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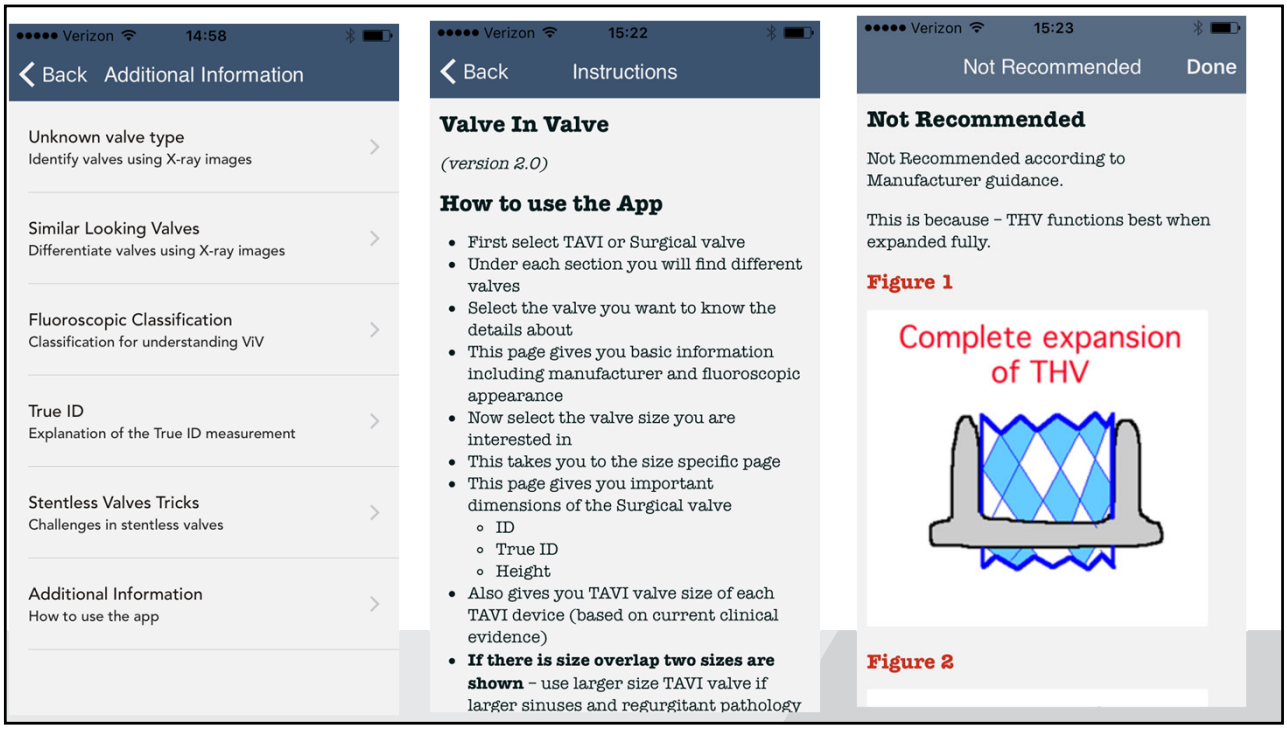

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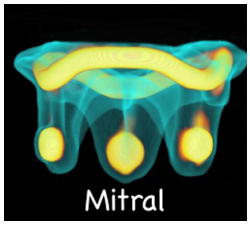
VIV Mitral APP

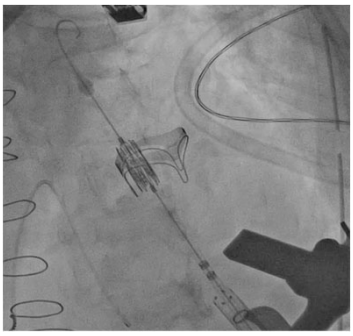


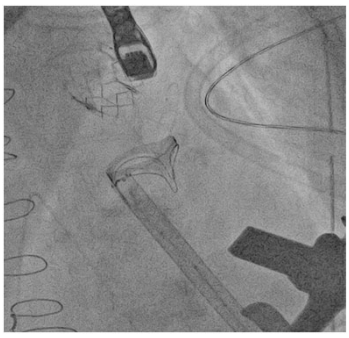
Developed in 14 days

72

Mitral therapy has different challenges

Sizing ?





73

Deployment and Sizing in Mitral

Delayed **migration** of Sapien valve following a transcatheter mitral valve-in-valve implantation.

Bapat VV, Khaliel F, Ihleberg L.

Catheter Cardiovasc Interv. 2014 Jan 1;83(1):E150-4. doi: 10.1002/ccd.25076. Epub 2013 Aug 12. PMID: 23784983

We report two cases of delayed **migration** of the Sapien XT device after a successful mitral valve-in-valve (VIV) implantation. ...We discuss possible mechanisms, which could have resulted in the delayed **migration** and highlight the difference between VIV procedures in ...

Oversizing is crucial

Parallel vs Conical deployment

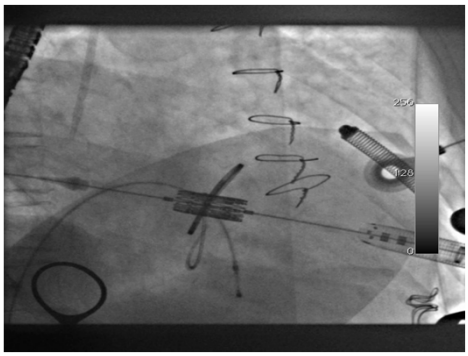
74

Mitral VIR

- Shape - Complete/Incomplete/Bands
- Rigidity - Rigid/Semirigid/Flexible
- Radio opacity- good/Intermediate/ none

- Edwards – 5 rings
- Medtronic – 6 rings
- St Jude – 4 rings
- Sorin – 6 rings

- Sizes – 24 to 40



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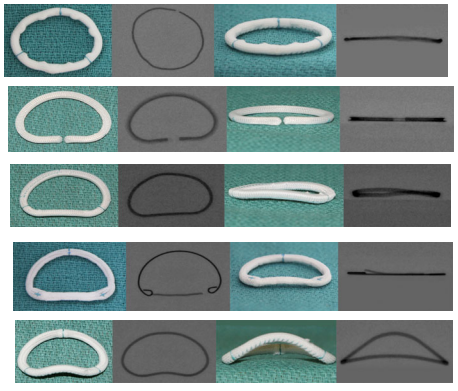
Mitral Valve in Ring

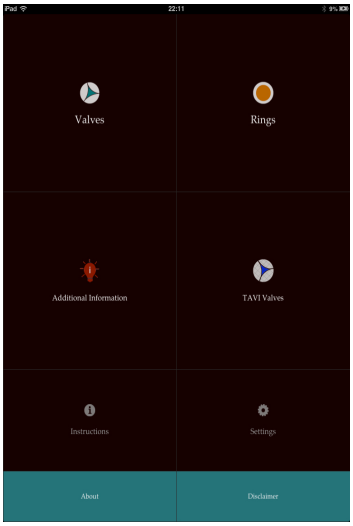
- Shape - Complete/Incomplete/Bands
- Rigidity - Rigid/Semirigid/Flexible
- Radio opacity- good/Intermediate/ none

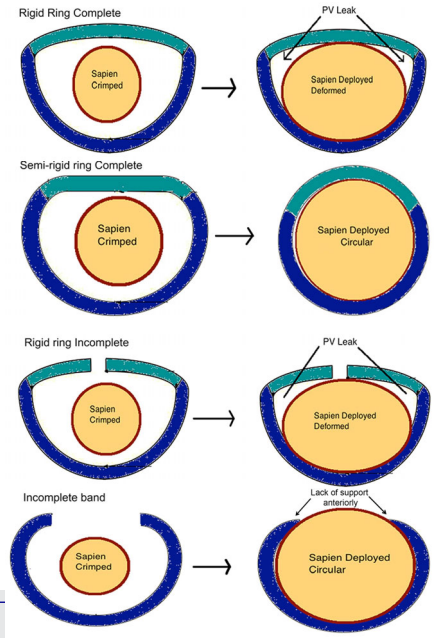
- Edwards – 5 rings
- Medtronic – 6 rings
- St Jude – 4 rings
- Sorin – 6 rings

- Sizes – 24 to 40



76





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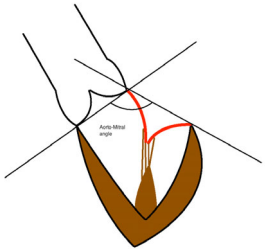
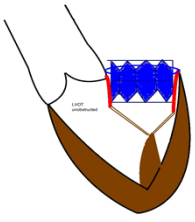
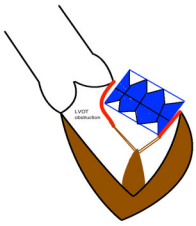
Risk of LVOTO



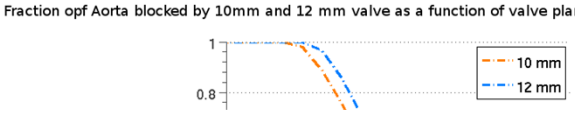




Less Chance if
AMA angle is obtuse

Greater Chance if
AMA angle is less obtuse

78



Review > Catheter Cardiovasc Interv. 2015 Oct;86(4):747-60. doi: 10.1002/ccd.25928.

Factors influencing left ventricular outflow tract obstruction following a mitral valve-in-valve or valve-in-ring procedure, part 1

Vinnie Bapat [1], Francesco Pirone [1], Stam Kapetanakis [1], Ronak Rajani [1], Steven Niederer [2]

Affiliations + expand

PMID: 26386239 DOI: 10.1002/ccd.25928

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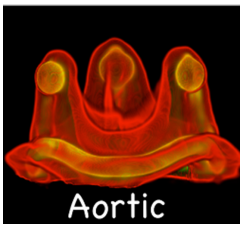
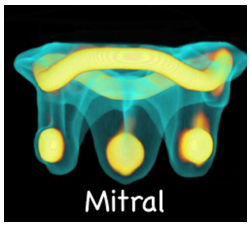
Valve In Valve Apps





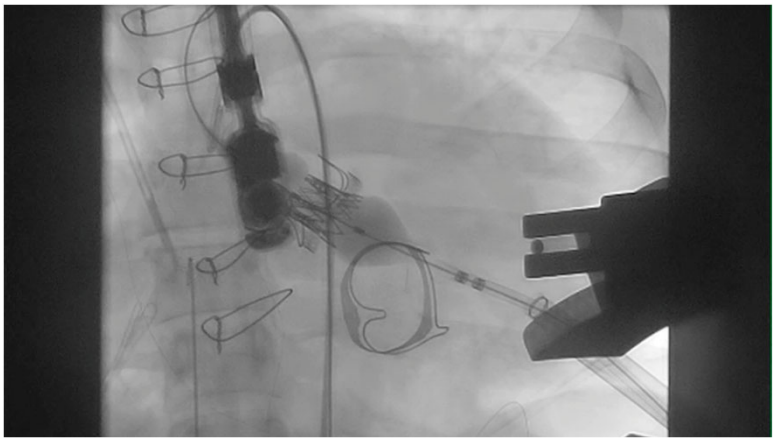
- Correct Patient
- Correct VIV combination
- Correct position

Downloaded in 130 countries
Free Educational guide
Used by everyone in TAVR field

- Publications: > 40
- Presentations: >100
- Trainees, Medical students and Highschool students have published and presented in national and international meetings

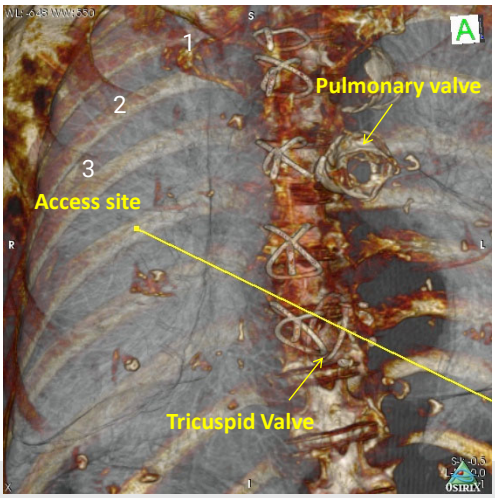
80

Case in Oman – Pregnant patient with 2 failed valves



81

Double VIV in Oslo



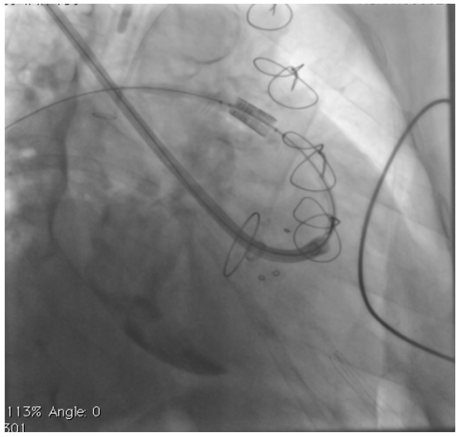
Pulmonary: Freestyle valve

Tricuspid: Hancock 2

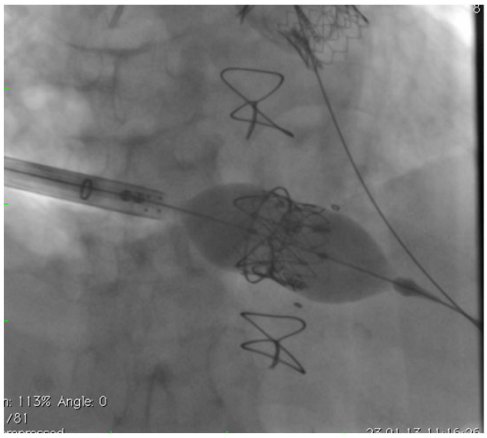
Access

82

Pulmonary VIV – TF system



RF3 – Sapien XT 26



Ascendra plus Sapien XT 29

83

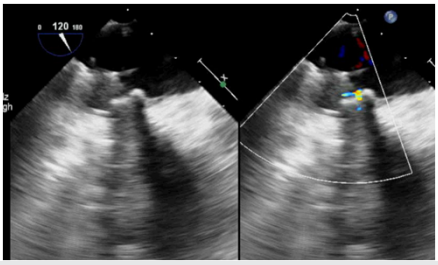
Taking TAVR to OR

84

Hybrid Surgery

11 year old patient
1. DORV repair
2. MV Repair
3. MVR – 21 St Jude Mechanical valve

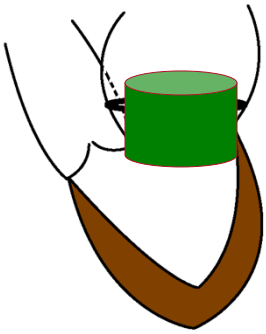
Presented in Pulmonary oedema
within one month with thrombosed valve
(INR 4)



Plan
Implant a surgical valve but it would be too small

85

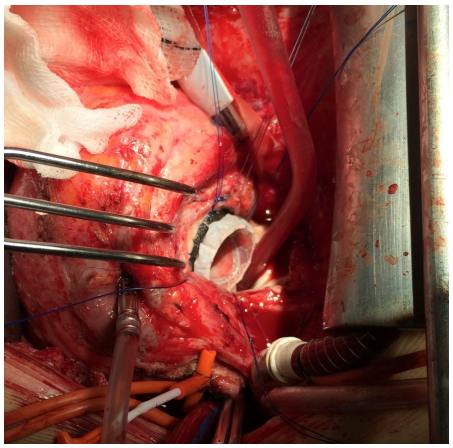
Use 3D memo ring
Implant Supra-annular (in the atrium)
Implant Sapien 3

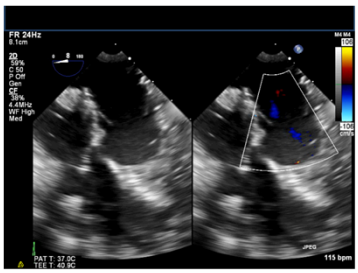


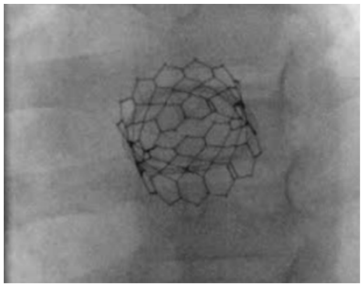
Size 28 Ring
Sapien 23

86

Exploited knowledge of Valve-in-Ring Concept



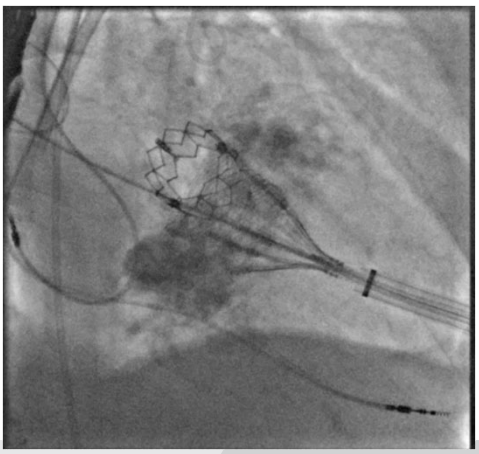




87

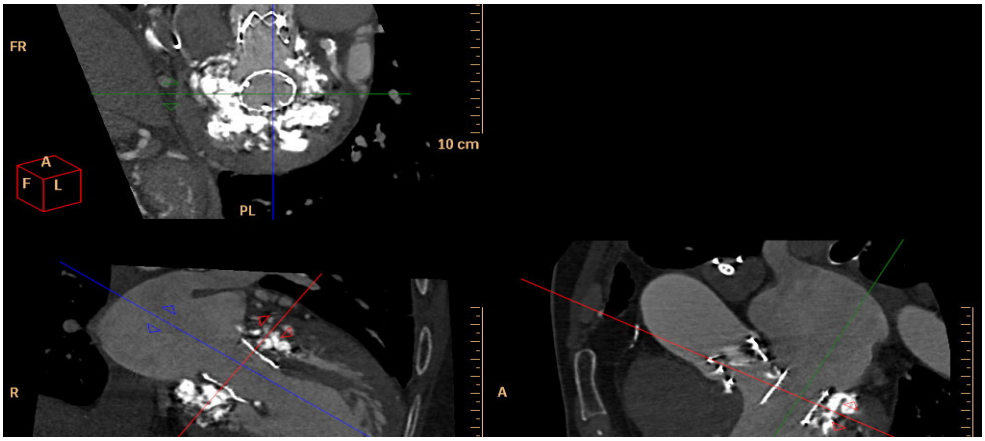
TAVR in MAC beating heart

78 year old
TAVR and TAVR in MAC
Presented with persistent MR
Heavy MAC



88

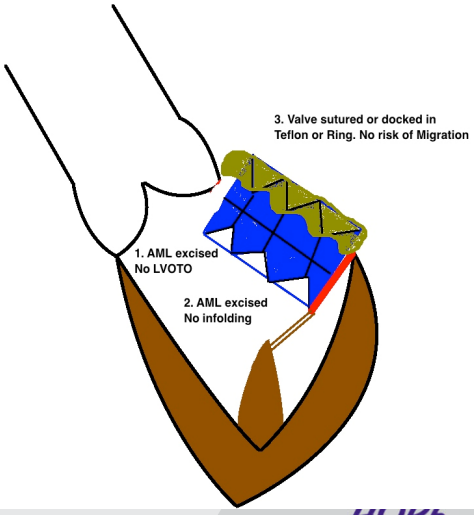
Follow up CT at 3 years



89

THV in Open surgery

Reported results
have been excellent compared
to TAVI option



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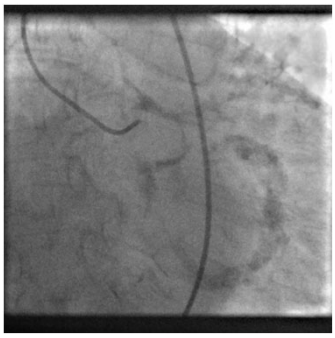
Case Example



Considered for
TAVI and Sapien in Mitral

↓

High risk of LVOTO

Open AVR-MVR and CABG

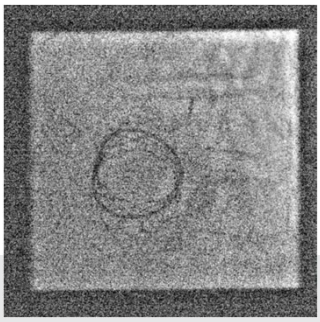
91

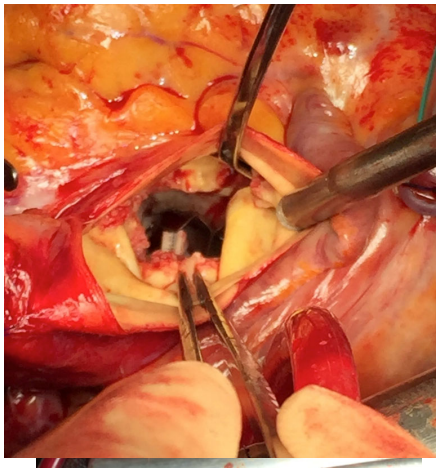
AML Excised
Size now was 33

Mitral sutures cutting through

↓

Physio 32 ring sutured
Sapien3 29 implanted





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TCT 2020 live case

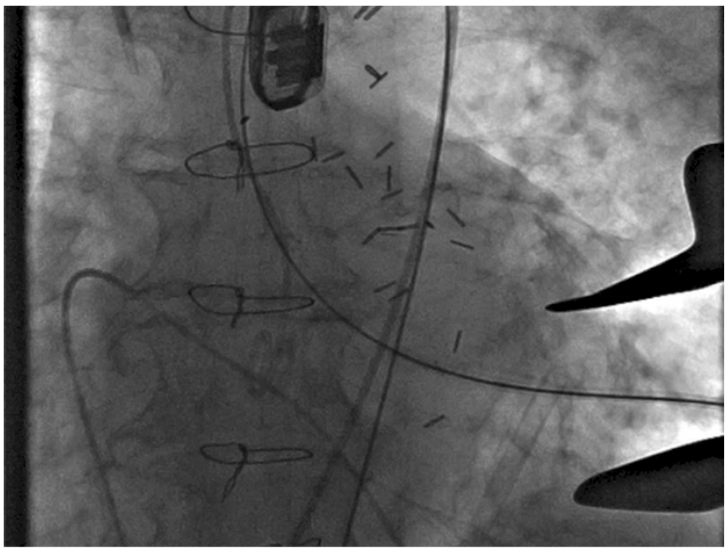
- Hybrid Mitral VIV case

93

CSI TAVR and Difficult cases

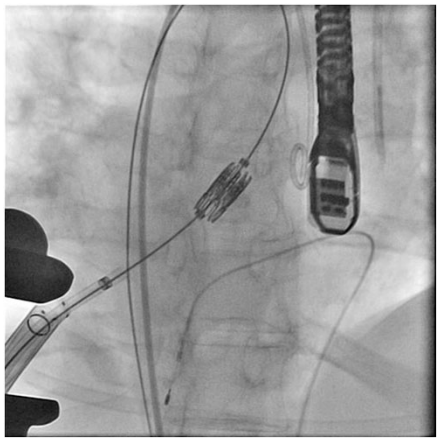
- This has been the best reward
- Friendships all over the world
- Learning to solve difficult valve issues and find innovative solutions and also find out what went wrong

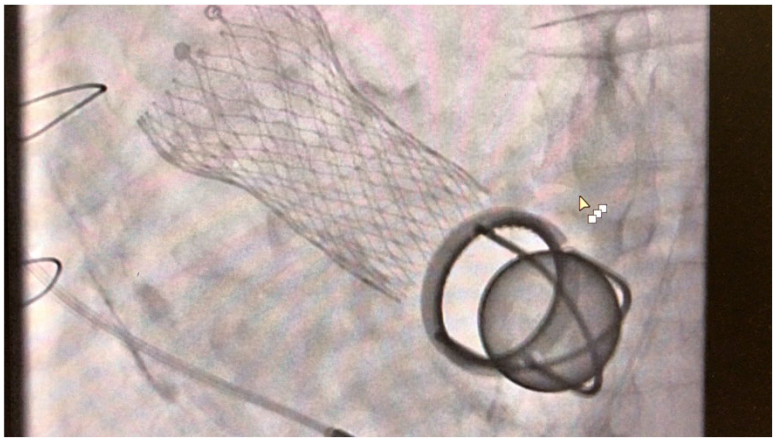
94



95

Cool cases

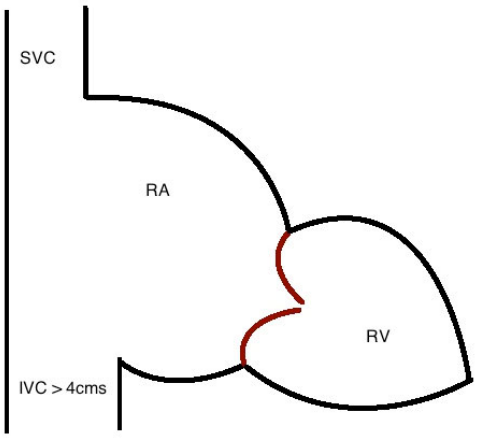




96

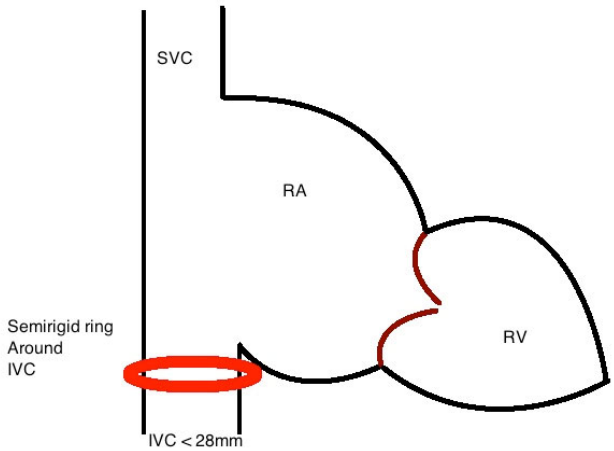
TR with no options

68 year old
Two prior surgeries
AVR- Mechanical
MVR- Mechanical
Severe TR
Hepatic pre-coma



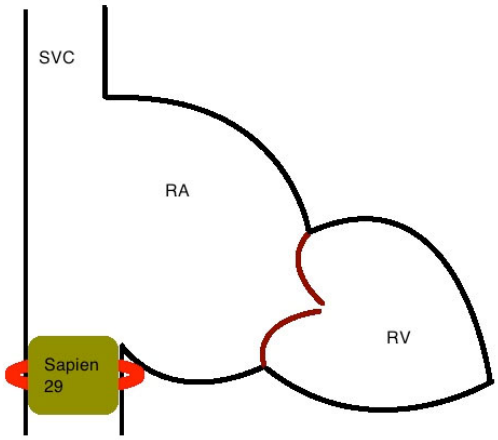
97

Sapien in IVC



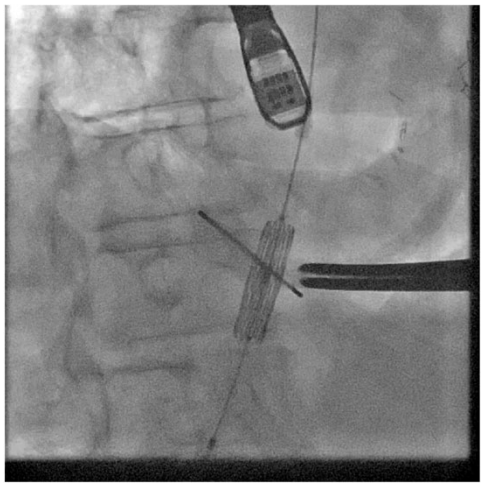
98

Sapien in IVC



99

Sapien in IVC



100

New Technology

Transcatheter Mitral Valve replacement

Abbott Tendyne

Edwards CardiAQ

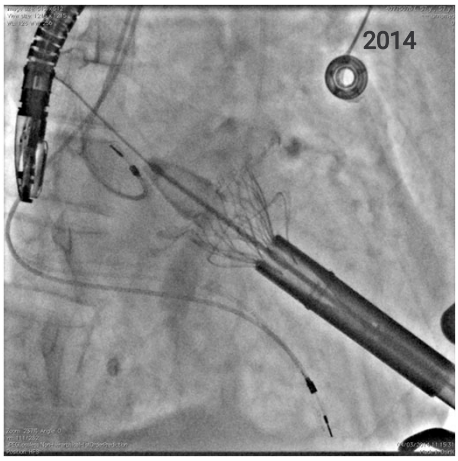
Edwards Fortis

Medtronic Twelve

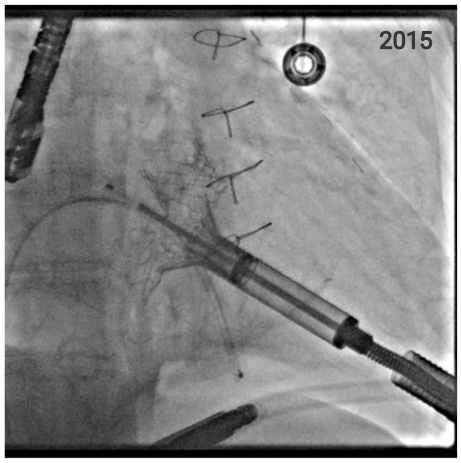
Neovasc

101

Fortis



Intrepid



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Navigate Tricuspid Valve

103

What about surgery!

Surgeons feel I am a cardiologist

Cardiologist feel I am a surgeon!

104

IMPACT ON SURGICAL PRACTICE

105

Use of CT and advance imaging

- TAVI
- Transcatheter Mitral
- Valve in Valve Aortic
- Valve in valve Mitral
- MAC
- LVOTO
- Aortic Valve replacement
- Aortic surgery
- Unusual pathologies
- Peripheral access
- Redo surgery
- Mitral Surgery?

106

Team building

- Not to work in isolation
- Work with other stake holders
  - Perfusionist
  - Nursing staff
  - Anaesthetist
  - Cardiologist

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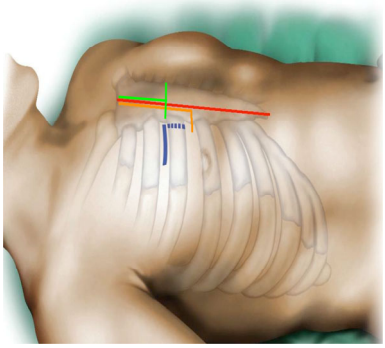
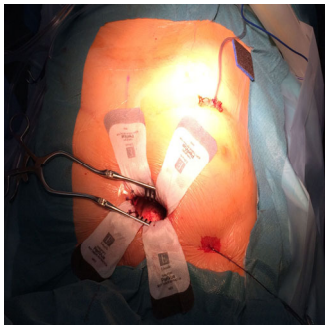
ART- AVR

- (Anterior Right thoracotomy)





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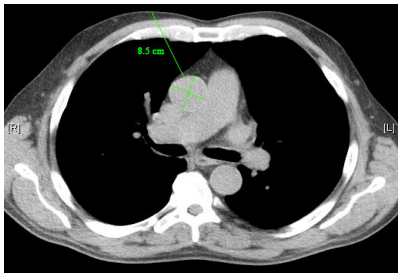
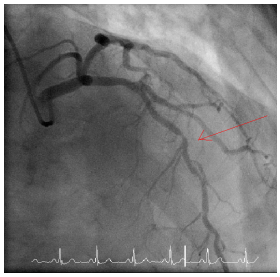
Hybrid approach: miniAVR + PCI





Pre-ART

Post-ART

First Stage

AVR via ART
23 mm Perimount Magna

Second Stage

PCI + Stenting of the LAD

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Developing multiple Strategies for Aortic valve disease

2000 — AVR full sternotomy

2002 — AVR – full and Hemi sternotomy

2008 — TAVI

2013

- AVR: full sternotomy
- AVR: MIS
- AVR + PCI
- AVR +CABG
- TAVI
- TAVI + PCI

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Concept of Lifetime management

Single or no Surgery
No anticoagulation
Minimum morbidity

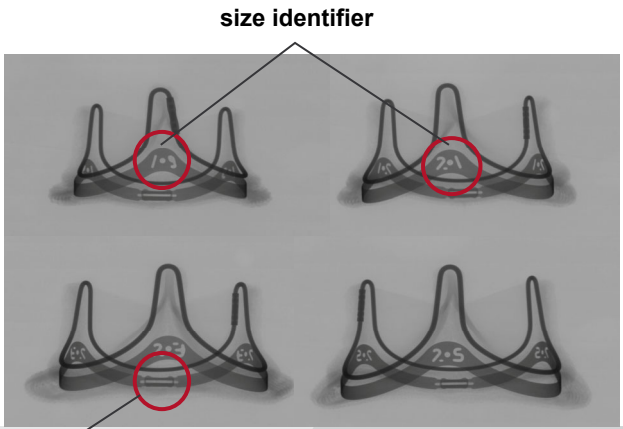
Age of the patient
Life expectancy
Other issues – Coronary, valves etc

One product fits another ***

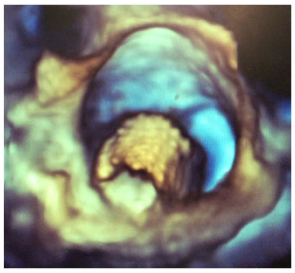
111

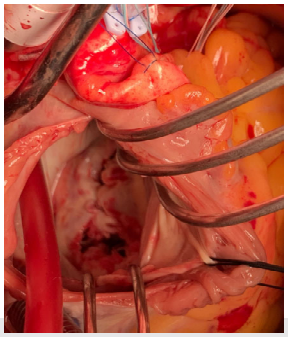
A novel surgical bioprosthesis - INSPIRIS

Designed to enable optimal valve-in-valve, if needed.



112





Technology has limitations
Technology doesn't always work
New Technology may not work as expected

1. International TAVR-Explant Registry
2. International Cutting-Edge registry
3. Educational videos for explant

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Current and future challenges

Sequencing

SAVR	VIV	Surgery
TAVR	SAVR	VIV
TAVR	TAVR in TAVR	Surgery

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Fun facts

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Travelled – all continents except Antartica
Round the world trips 7 times
Snow and dessert storms
Trained the Northern most and probably Southernmost TAVR center in world

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Friendship and fun

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Some things change but most don't !

Toronto 1999

Toronto 2014

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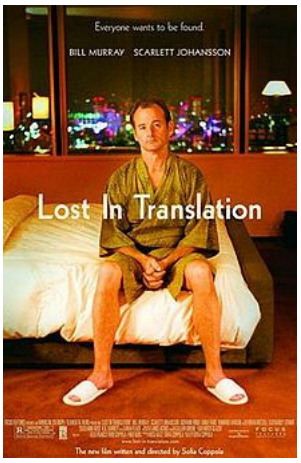
Lost in translation



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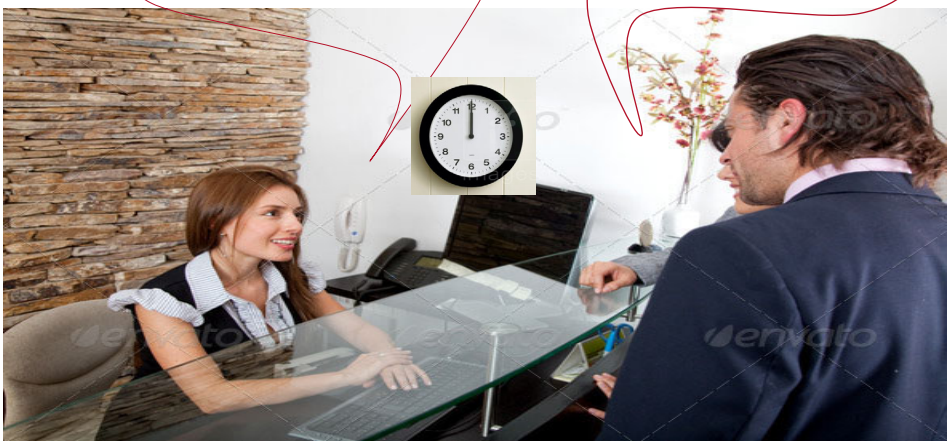

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Tale of Two cities

122

‘Chance only favours the prepared mind’

- Louis Pasteur

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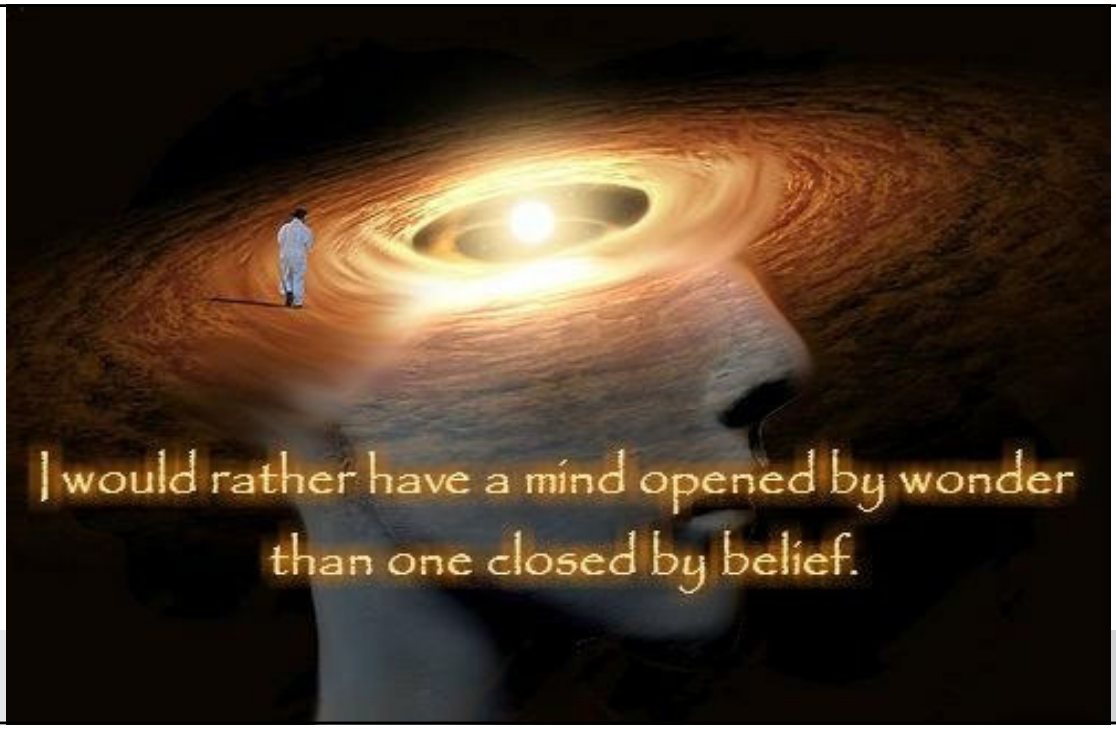

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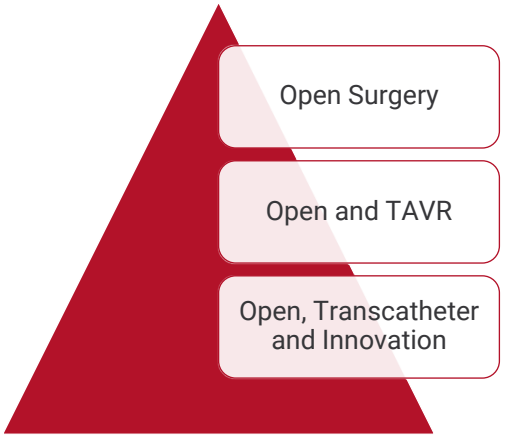
My role has evolved since 2007



TAVR compatible SAVR designs
TAVR compatible Ring designs
Valve fracture advance projects
AI and commissure alignment

125

It feels like *STAR TREK*

TAVR Travels
Lecture
2009

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