PLACE

PLATFORM OF LABORATORIES FOR ADVANCES IN CARDIAC EXPERIENCE

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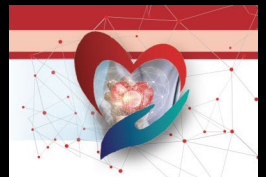
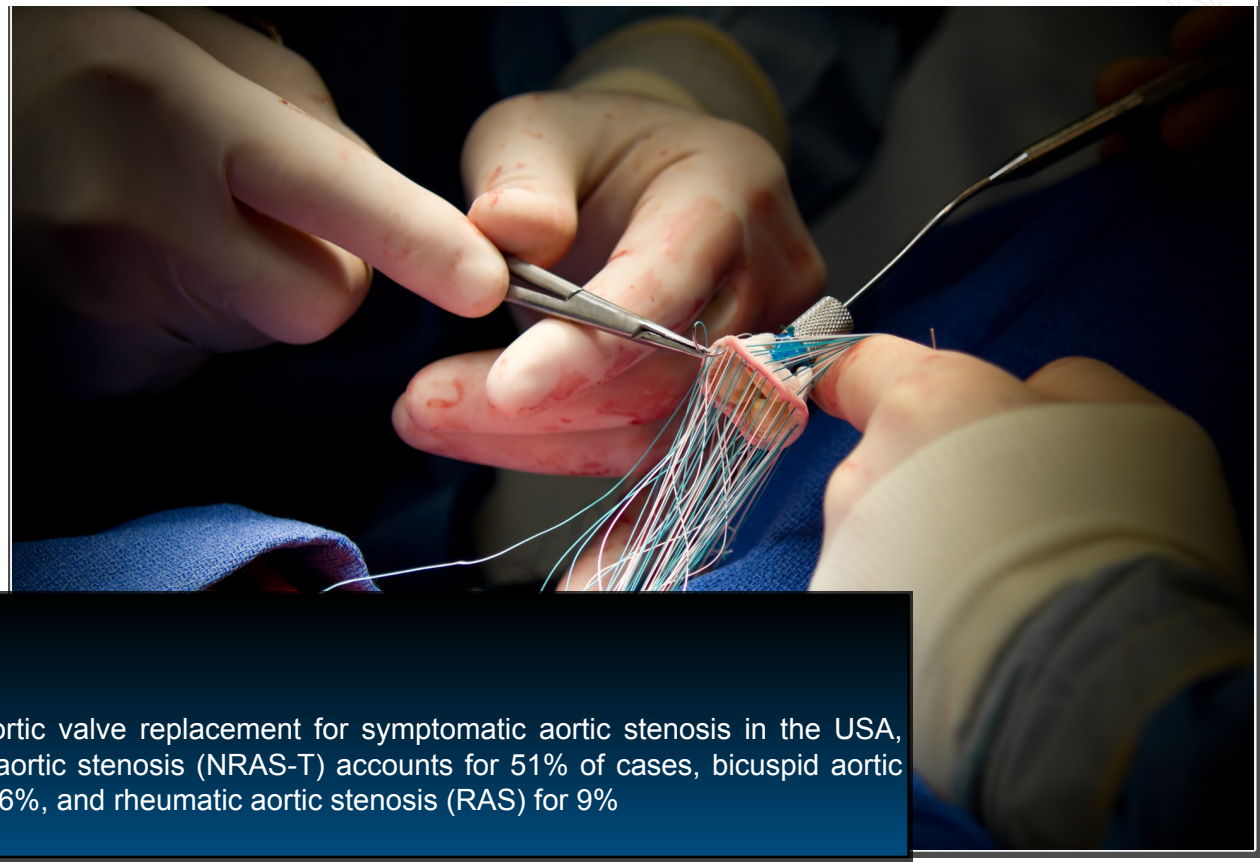
TAVI E STENOSI VALVOLARE AORTICA REUMATICA: ABBIAMO SUFFICIENTI INFORMAZIONI PER CAPIRE COSA E CHI?

Prof. Carlo Bassano

Rheumatic heart disease (RHD) is the cardiac sequela of acute rheumatic fever, an immune-mediated, multisystem inflammatory disease that follows group A Streptococcal infection



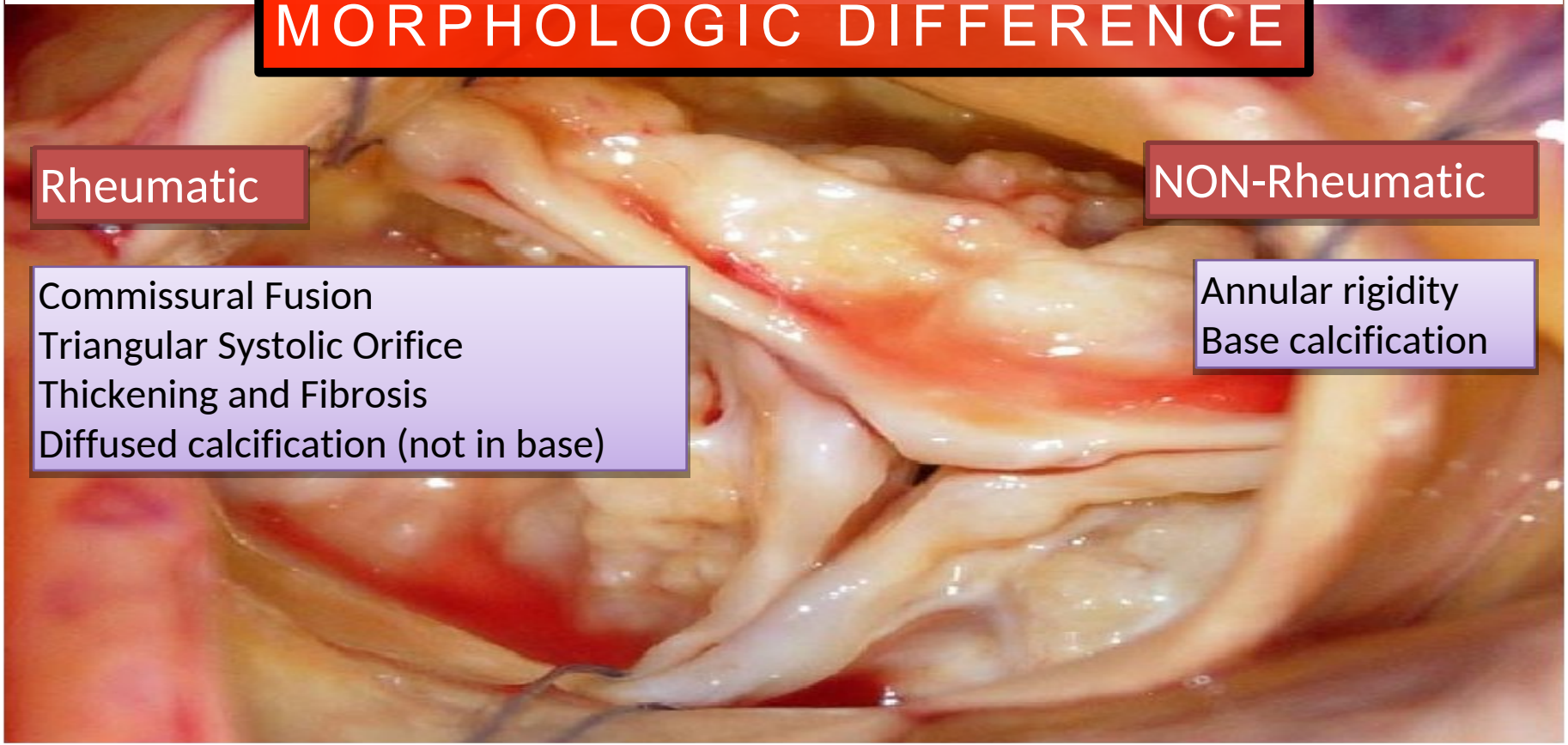


In adults undergoing aortic valve replacement for symptomatic aortic stenosis in the USA, nonrheumatic tricuspid aortic stenosis (NRAS-T) accounts for 51% of cases, bicuspid aortic stenosis (NRAS-B) for 36%, and rheumatic aortic stenosis (RAS) for 9%

Transcatheter aortic valve implantation (TAVI) has become an established treatment for patients with severe aortic valve stenosis (AS) who are inoperable or at high surgical risk, and an attractive alternative in intermediate surgical-risk patients

TAVI has been increasingly applied to off-label indications such as bicuspid AS, degenerated surgical bioprosthesis (valve-in-valve TAVI), non-calcific AS, and pure aortic regurgitation.

MORPHOLOGIC DIFFERENCE



Rheumatic

Commissural Fusion
Triangular Systolic Orifice
Thickening and Fibrosis
Diffused calcification (not in base)

NON-Rheumatic

Annular rigidity
Base calcification

The anatomical differences compared with degenerative AS may have a technical impact on the transcatheter heart valve deployment and anchoring.

TAVI has not been aggressively performed because of potential improper anchorage of the transcatheter heart valve due to lack of calcium in the aortic valve

These anatomical differences could result in transcatheter heart valve migration or paravalvular regurgitation.

Patients with a rheumatic etiology for their AS were excluded from the pivotal randomized controlled trials like

1. Leon MB, Smith CR, Mack MJ et al. Transcatheter or Surgical Aortic-Valve Replacement in Intermediate-Risk Patients. N Engl J Med 2016;374:1609–20. [PubMed: 27040324]
2. Reardon MJ, Van Mieghem NM, Popma JJ et al. Surgical or Transcatheter Aortic-Valve Replacement in Intermediate-Risk Patients. N Engl J Med 2017;376:1321–1331. [PubMed: 28304219]

due to the low prevalence of rheumatic AS in developed countries,

our knowledge about the role of TAVR in those patients is limited to case reports or series.

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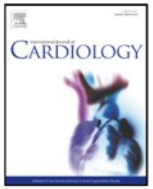
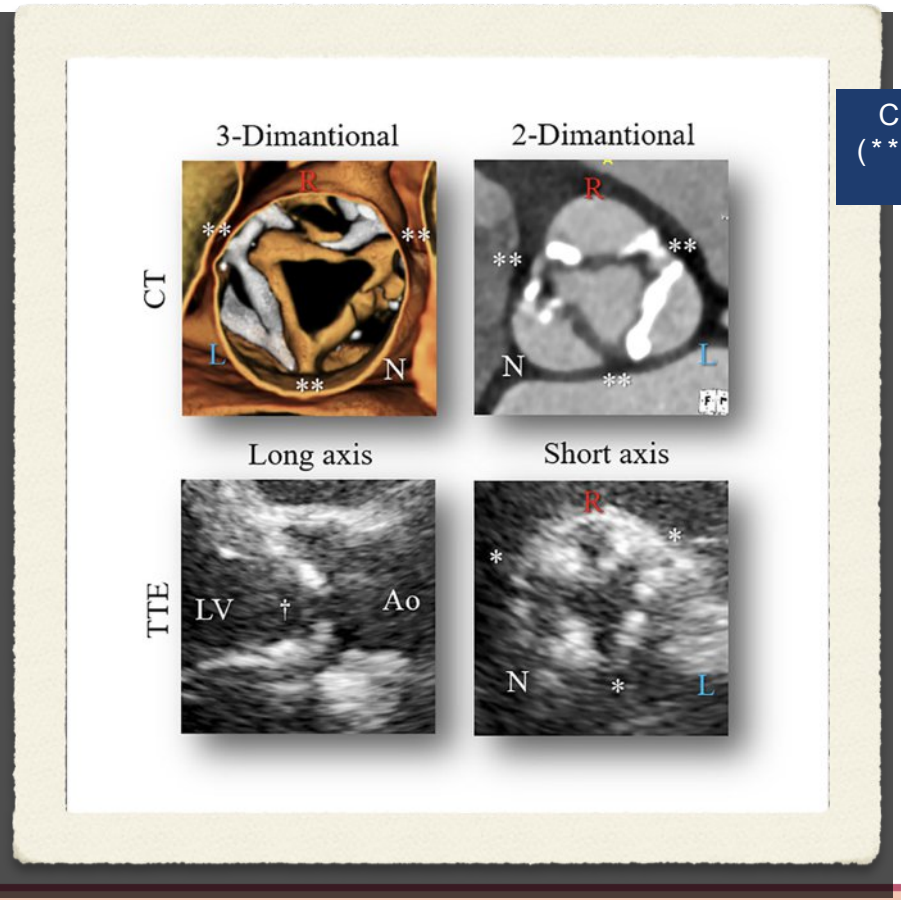


Transcatheter aortic valve replacement in patients with degenerative calcified rheumatic aortic stenosis: A 10-patient case series☆

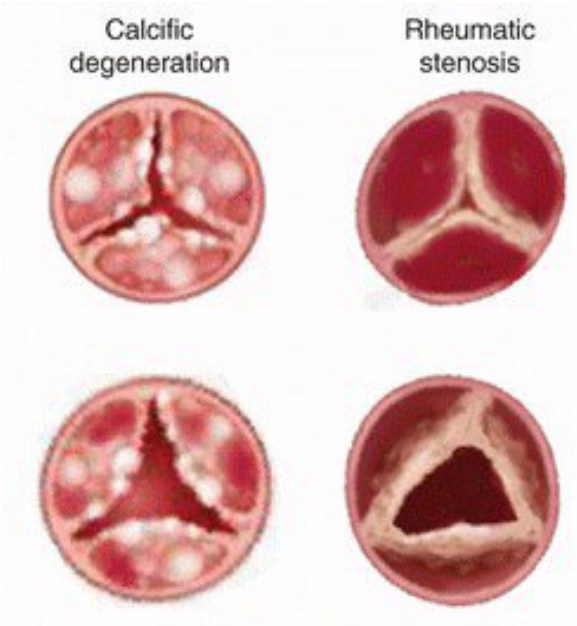
Mike Saji [a,*], Ryosuke Highchi [a], Nobuo Iguchi [a], Jun Shimuzu [b], Tetsuya Tobaru [a], Shuichiro Takanashi [c], Morimasa Takayama [a], Mitsuaki Isobe [a]

[a] Department of Cardiology, Sakakibara Heart Institute, Tokyo, Japan
[b] Department of Anesthesia, Sakakibara Heart Institute, Tokyo, Japan
[c] Department of Cardiovascular Surgery, Sakakibara Heart Institute, Tokyo, Japan

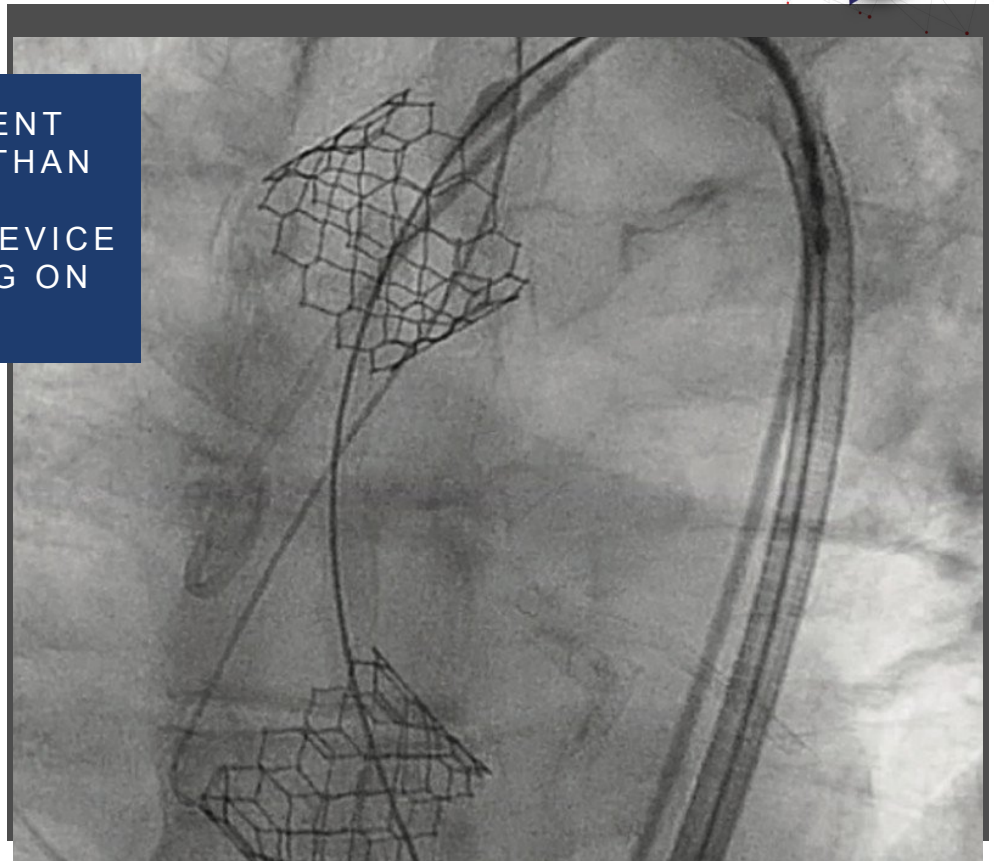
Of 352 consecutive patients with severe aortic stenosis (AS) who underwent TAVI at the Sakakibara Heart Institute between 2013 and 2016, 10 patients (2.8%) were considered to have degenerative calcified rheumatic AS by transthoracic echocardiography.



CT NICELY DEMONSTRATES FUSED COMMISSURES (**), CALCIFICATION AND AN IRREGULAR THICKENED VALVE



SLIGHTLY MORE OVERSIZED DEPLOYMENT USING A BALLOON-EXPANDABLE VALVE THAN USUAL DEPLOYMENT TO THE PURE DEGENERATIVE VALVE MIGHT PREVENT DEVICE DISLOCATION/EMBOLIZATION DEPENDING ON THE OVERSIZE OF THE VALVE.



Device success was 90%

1 case subsequently had 29 mm SAPIEN 3 valve after 29 mm Evolut R deployment failure due to difficulty anchoring for calcification

1 case required cardiopulmonary bypass during TAVI due to cardiogenic shock,

2 case required 20% oversizing for anchoring due to a small amount of calcification

1 case 29-mm SAPIEN 3 valve was initially considered the best option by CT annular area measurement. However, bulky calcification on the left ventricular outflow tract and angiogram during balloon valvuloplasty suggested a smaller valve, and a 26-mm SAPIEN 3 valve was finally deployed with an additional 1 cc, resulting in acceptable paravalvular leak without annular rupture.

1 case with a SAPIEN 3 valve, although underexpansion was appreciated at the right coronary cusp due to heavy calcification

Transcatheter vs. Surgical Aortic Valve Replacement in Patients with Rheumatic Aortic Stenosis

Amgad Mentias, MD MSc[1], Marwan Saad, MD PhD[2], Milind Y. Desai, MD[1], Amar Krishnaswamy, MD[1], Venu Menon, MD[1], Phillip A. Horwitz, MD[3], Samir Kapadia, MD[1], Mary Vaughan Sarrazin, PhD[3,4]

[1]:Heart and Vascular Institute, Cleveland Clinic Foundation, Cleveland, OH

[2]:Cardiovascular Institute, The Warren Alpert Medical School at Brown University, Providence, RI

[3]:Department of Internal Medicine, University of Iowa Carver College of Medicine, Iowa City, IA

[4]:Comprehensive Access and Delivery Research and Evaluation Center (CADRE), Iowa City VA Medical Center, IA

COMPARED WITH TAVR IN NON-RHEUMATIC AS, TAVR FOR RHEUMATIC AS WAS ASSOCIATED
NONE OF THE RHEUMATIC TAVR PATIENTS UNDERWEN

J Am Coll Cardiol. 2021 April 13; 77(14): 1703–1713. doi:10.1016/j.jacc.2021.02.032.

Patients in the SAVR group were younger and had lower prevalence of most comorbidities including hypertension, diabetes, heart failure, lung disease, kidney disease, peripheral arterial disease, stroke, coronary artery disease, atrial fibrillation, anemia, and pulmonary hypertension, compared to TAVR group

In-hospital and short-term outcomes with TAVR in non-rheumatic versus rheumatic AS, before and after PS weighting adjustment

	Before adjustment			After adjustment		
Outcome	**Non-rheumatic AS (N=88,554)**	**Rheumatic AS (N=605)**	**P value**	**Non-rheumatic AS (N=88,554)**	**Rheumatic As (N=605)**	**P value**
AKI, %	11.3	14.4	0.02	13.7	14.4	0.7
Cardiac arrest, %	2.0	<1.7	0.3	2.3	1.3	0.2
Conversion to surgery, %	3.5	2.2	0.07	4.0	2.1	0.07
Blood transfusion, %	7.4	9.1	0.1	9.5	9.0	0.8
Cardiogenic shock, %	1.9	2.0	0.9	2.4	2.0	0.6
Aortic annulus rupture, %	1.1	1.7	0.2	0.9	1.7	0.3
New onset AF, %	2.9	2.2	0.3	2.4	2.2	0.8
New PPM, %	11.6	12.2	0.6	11.4	12.2	0.7
In-hospital mortality, %	1.9	2.2	0.7	2.6	2.2	0.6
30-day stroke, %	2.5	2.0	0.4	3.3	2.0	0.1
30-day mortality, %	2.9	3.6	0.3	3.7	3.6	0.95
1-year mortality, %	13.6	16.0	0.09	17.1	16.0	0.6

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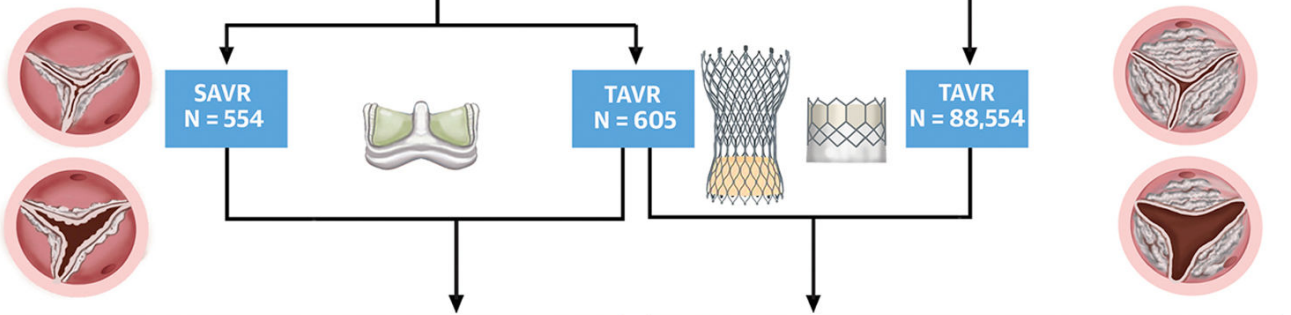
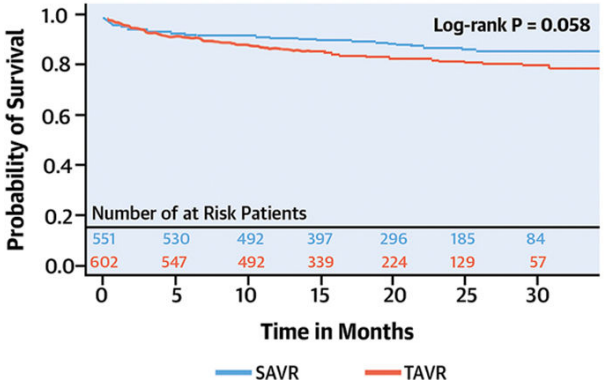
Rheumatic Aortic Stenosis
N = 1,159

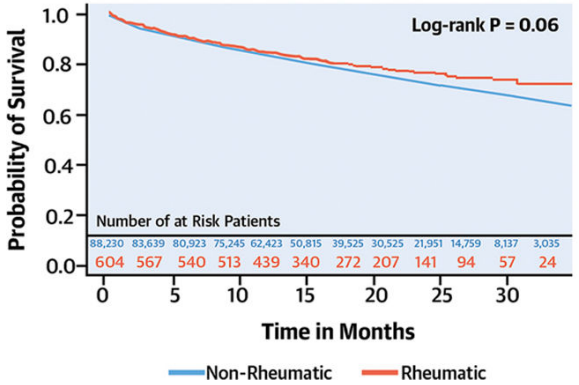
Non-Rheumatic Aortic Stenosis



Adjusted Survival with TAVR versus SAVR in Patients with Rheumatic AS



Adjusted Survival with TAVR in Rheumatic versus Non-Rheumatic AS



CLOSING REMARKS

Successful deployment of TAVI valve depends on annular and leaflet calcifications to act as an anchor.

Marginal calcification on the aortic valve potentially embolizes or dislocates TAVR valves

CT was able to clearly visualize the calcified aortic valve old in patients with RHD, which can be called “degenerative calcified rheumatic AS”, TAVI in this population was safe and efficient.

CLOSING REMARKS

As rheumatic AS involves a similar pathology to that of leaflet thickening and fibrosis, it is likely that a transcatheter valve could be successfully anchored.

What remains uncertain is if the commissural fusion would be “split”, as with mitral valvuloplasty, or if the annulus would merely be stretched to accommodate the new valve.

The lack of extensive annular and leaflet calcification in rheumatic AS may offer a benefit toward a safer deployment with appropriate oversizing to reduce the risk of residual paravalvular leakage without increased risk of annular injury/rupture as compared with calcific AS especially in patients with concomitant/pure aortic regurgitation and dilated aortic root.

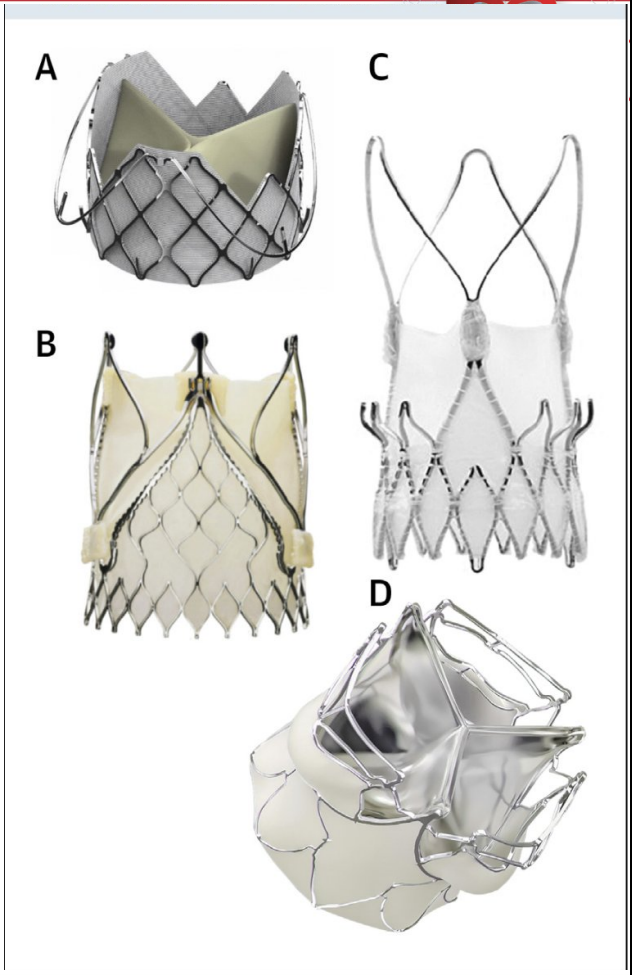
I WILL TRY TO ANSWER YOUR QUESTION

TAVI e stenosi valvolare aortica reumatica: abbiamo sufficienti informazioni per capire cosa e a chi?
C. Bassano, Roma

It is not uncommon for patients with rheumatic AS to have had several episodes of heart valve surgery for mitral and tricuspid valve pathologies. Due to the previous sternotomies, longstanding cardiac disease and advancing age, many of these patients will be at elevated risk for aortic valve replacement.

Thus, TAVI may have a unique role in such patients.

WITH NEWER-GENERATION TAVI DEVICES WHICH HAVE AN OUTER SKIRT (TO REDUCE PARAVALVULAR LEAK) OR RECAPTURABILITY (TO ENHANCE ACCURATE DEPLOYMENT), THE OUTCOMES OF TAVI IN RHEUMATIC AS CAN BE EXPECTED TO IMPROVE

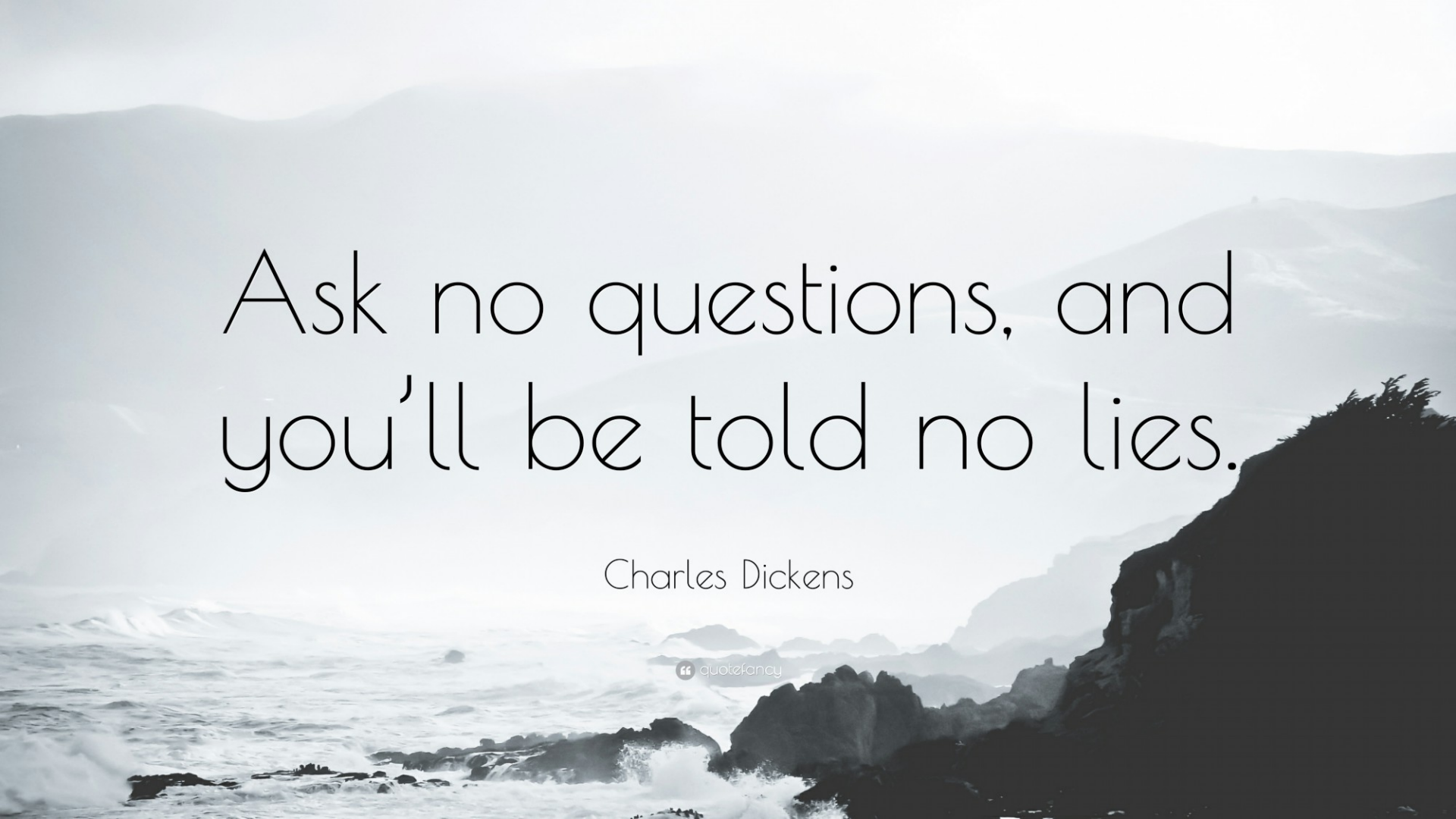


There are, however, questions that remain unanswered

Which type of TAVI device (balloon-expandable or self-expandable) has a more stable anchorage in a less calcified aortic valve?

What is the exact mechanism of the transcatheter valve expansion when deployed within a rheumatic AS?

What is the durability of TAVI in these rheumatic patients who are generally younger and may still have an ongoing low grade inflammatory response?


Ask no questions, and you'll be told no lies.
Charles Dickens
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