



Practical approach in Small Aortic Root

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Ordibehesht 97, april 2018

AVR



Prosthesis type

EOA,

Porcelain Aorta

Root injury

Small Root

Systematic review/ meta-analysis
Papers 1964-2014

VOL. 9, NO. 8, 2016

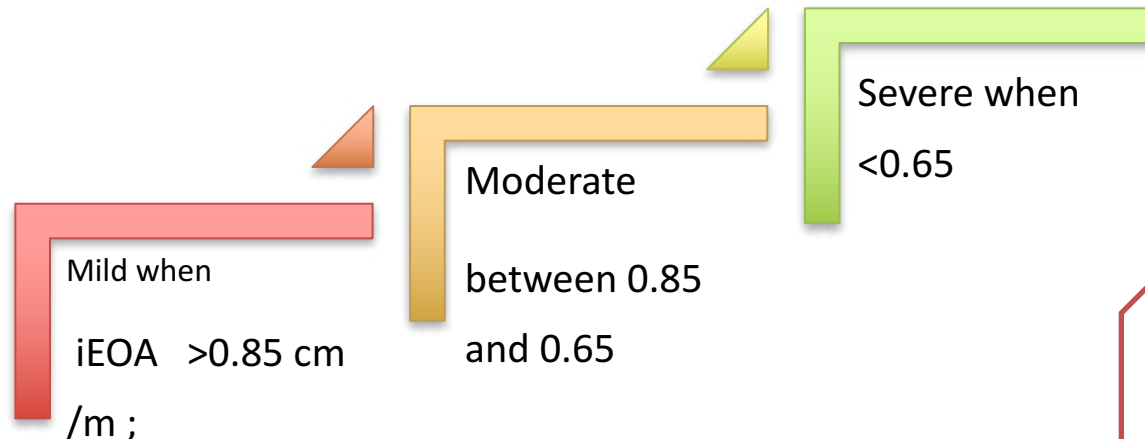
ISSN 1936-878X/\$36.00

<http://dx.doi.org/10.1016/j.jcmg.2015.10.026>



Predictors and Outcomes of Prosthesis-Patient Mismatch After Aortic Valve Replacement

Victor Dayan, MD, PhD,^a Gustavo Vignolo, MD,^a Gerardo Soca, MD,^a Juan Jose Paganini, MD,^a
Daniel Brusich, MD,^a Philippe Pibarot, DVM, PhD^b



Main outcome: Mortality

1) moderate and severe PPM are associated with a 1.5- and 2.5-fold increase in the risk of 30-day mortality following AVR

2) severe PPM is associated with a 1.4-fold increase in overall mortality, whereas moderate PPM is not significantly associated with increased risk of overall mortality

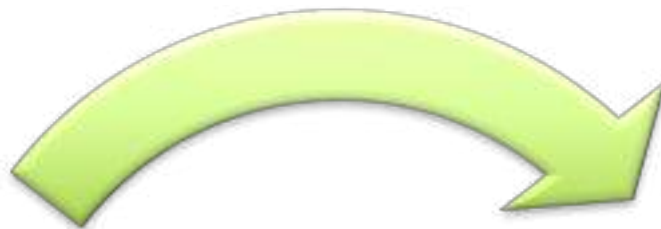
3) The impact of PPM on mortality appears to be more important in patients <70 years of age, and/or undergoing concomitant CABG

4) Moderate and severe PPM are associated with lesser regression of LV hypertrophy

5) The impact of PPM on mortality was less pronounced in patients with higher BMI.



Controversies



The clinical relevance of a small difference in gradient and otherwise asymptomatic patients is unclear.

Lower IEOA is predictor of poorer NYHA early after AVR, but not important during 7-year follow up.





ADULT CARDIAC SURGERY:

To participate in *The Annals of Thoracic Surgery* CME Program, please visit <http://cme.ctsnetjournals.org>.

Prosthesis-Patient Mismatch After Aortic Valve Replacement: Impact of Age and Body Size on Late Survival


Marc R. Moon, MD, Michael K. Pasque, MD, Nabil A. Munfakh, MD, Spencer J. Melby, MD, Jennifer S. Lawton, MD, Nader Moazami, MD, John E. Codd, MD, Traves D. Crabtree, MD, Hendrick B. Barner, MD, and Ralph J. Damiano Jr, MD

Division of Cardiothoracic Surgery, Washington University School of Medicine, St. Louis, Missouri

P-P mismatch defined as IE OA < 0.75 has a negative impact on survival in young patients but this impact is minimal in >60 yr patients (P < 0.005).

Prosthesis size and long-term survival after aortic valve replacement

The Journal of Thoracic and Cardiovascular Surgery • Volume 126, Number 3



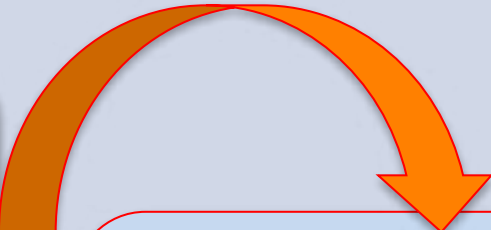
In a meta-analysis of 13258 patients undergoing AVR with small valve size showed that operative mortality increases by less than 1% in 10% of cases with small prosthesis BUT



Does not reduce midterm or long term survival.

Controversies

Valve related mortality & morbidity are higher in P-P mismatch group.

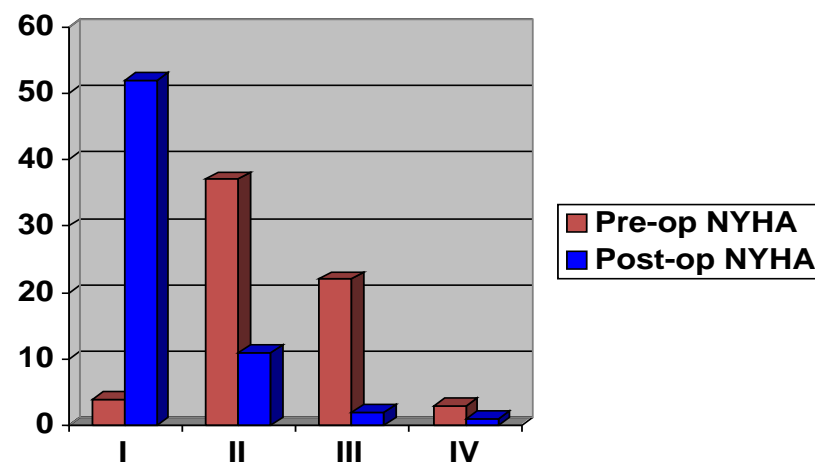


Overall survival is the same between patients with & without P-P mismatch

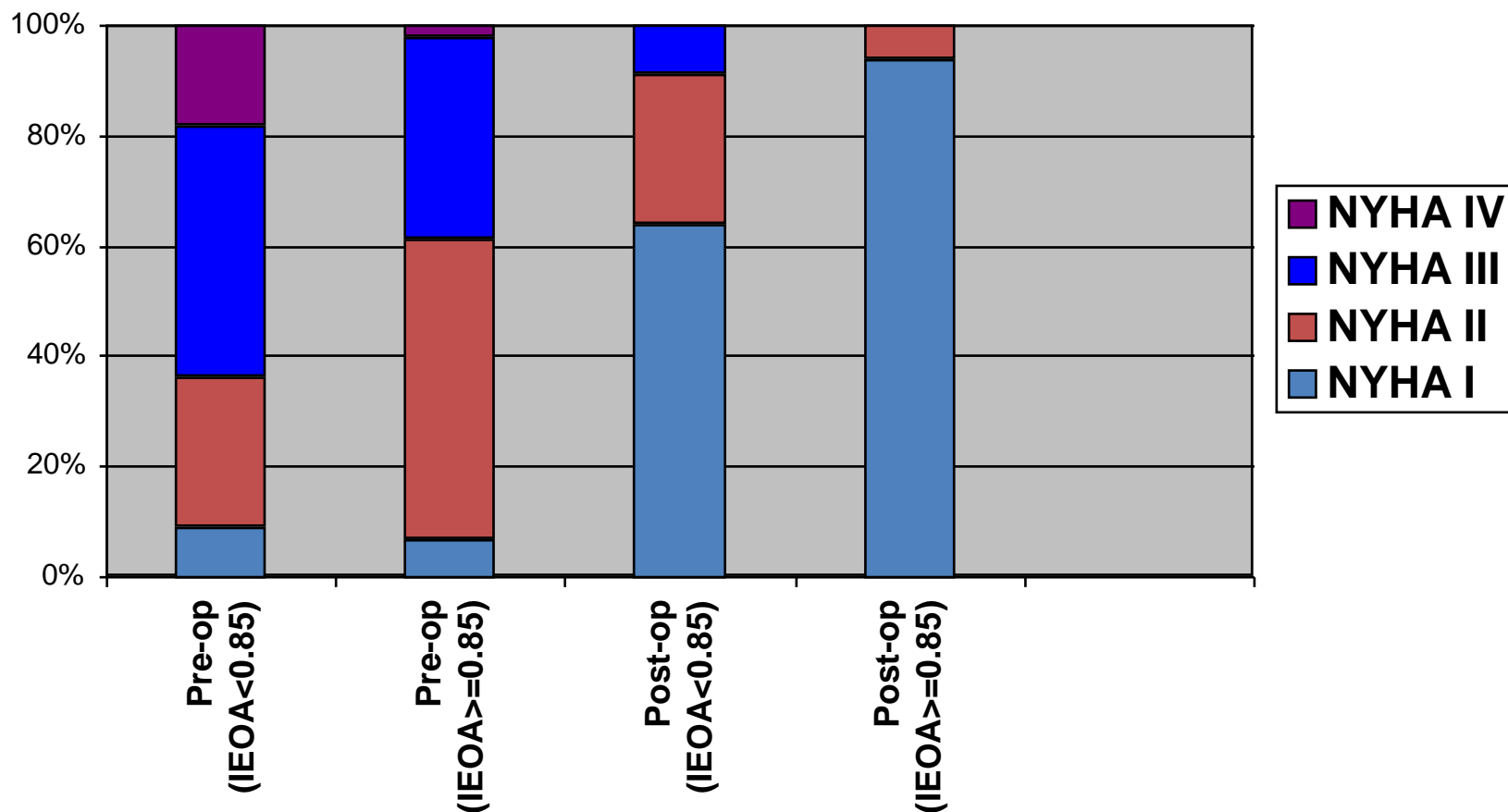
Moderate Patient-Prosthesis Mismatch Has No Negative Effect on Patients' Functional Status After Aortic Valve Replacement With CarboMedics Prosthesis

Alireza Alizadeh-Ghavidel,¹ Rasoul Azarfarin,^{1*} Azin Alizadehasl,² Ali Sadeghpour-Tabaei,¹ and Ziae Totonchi¹

	<u>Valve Size</u>				
	19	21	23	25	
Standard Carbomedics (No.)	2	16	18	17	53
Top Hat Carbomedics (No.)	1	3	6	3	13
	3	19	24	20	66



Comparison of Functional Status based on IEOA



P=0.08

RESEARCH ARTICLE

Open Access

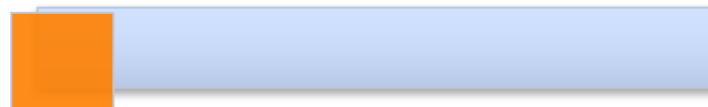


Impact of prosthesis–patient mismatch on short-term outcomes after aortic valve replacement: a retrospective analysis in East China

PPM is associated with high short-term mortality after AVR in China.



Female gender, aortic stenosis, bioprosthesis, and high BMI are risk factors for the incidence of PPM.





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journal homepage: www.e-asianjournalsurgery.com



ORIGINAL ARTICLE

Aortic valve replacement in small patients[☆]

Y. Hisata ^{a,*}, S. Yokose ^b, S. Hazama ^b, I. Matsumaru ^c, K. Eishi ^c

Small patients tended to be older and a higher proportion were women.

Favorable LV mass regression and EOAI in small patients.

Furthermore, no significant differences were found in the proportion of moderate and severe PPM.

Short- and mid-term outcomes were safe and favorable, suggesting that patients with small BSA can safely undergo AVR.



Ignore some degrees of mismatch in
selected or high risk patients

OPEN

Incidence, Predictors and Outcome of Prosthesis-Patient Mismatch after Transcatheter Aortic Valve Replacement: a Systematic Review and Meta-analysis

Received: 9 June 2017

Accepted: 26 October 2017

Published online: 08 November 2017

Yan-biao Liao, Yi-jian Li, Li Jun-Ji, Zhen-gang Zhao, Xin Wei, Jiay-yu Tsao, Tian-yuan Xiong, Yuan-ning Xu, Yuan Feng & Mao Chen

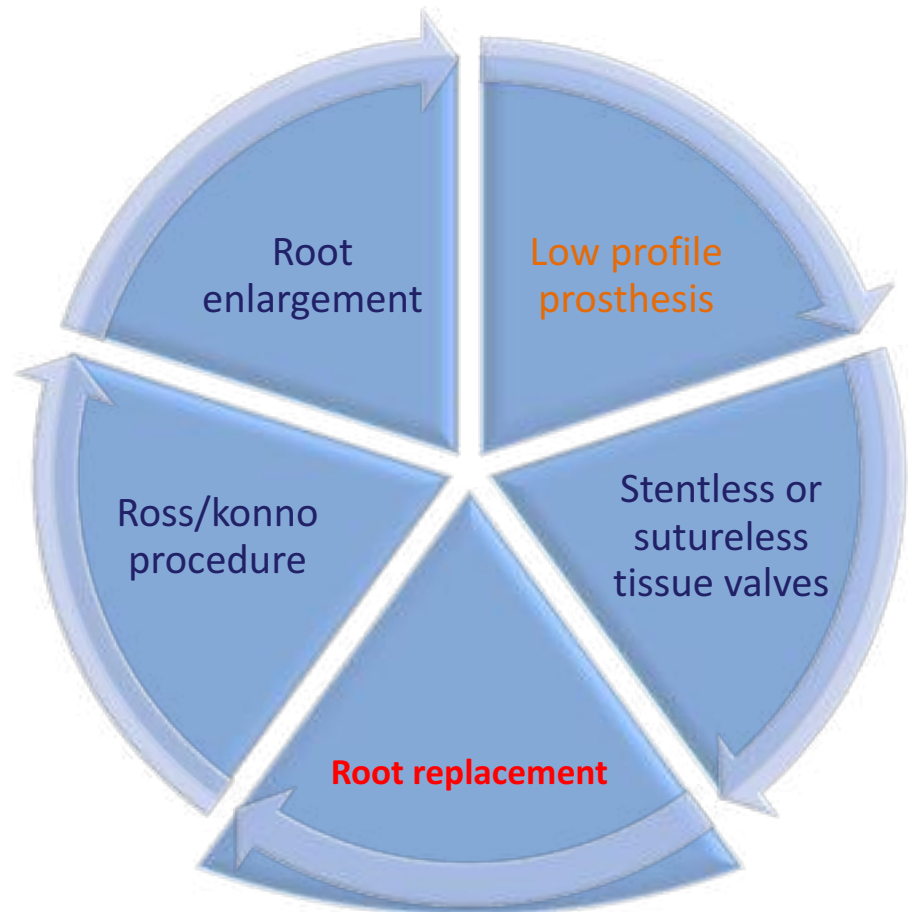
A total of 30 articles
incorporating 4,691 patients

pooled incidences of overall, moderate and severe PPM following TAVR were 33.0%, 25.0% and 11.0% respectively.

Medtronic CoreValve (MCV) had lower incidence of PPM than ESV

PPM was not seen to impact on short- and mid-term survival, regardless of its magnitude.

Surgical options



Mortality and Morbidity After Aortic Root Replacement: 10-Year Experience

Alireza A Ghavidel, MD, Mohammad B Tabatabaei, MD,
 Mohammad A Yousefnia, MD, Gholam-Reza Omrani, MD,
 Nader Givtaj, MD, Kamal Raesi, MD



ASCVTs The Asian Society
for Cardiovascular
and Thoracic Surgery

(Asian Cardiovasc Thorac Ann 2006;14:462-6)

Table 4. Causes of Early and Late Mortality

Deaths	No. of Patients	%
Early (hospital) death	11	13.3
Cardiac failure	5	6.0
Multiorgan failure	3	3.6
Bleeding	2	2.4
Arrhythmia	1	1.2
Late death	2	2.4
Myocardial infarction	1	1.2
Unknown	1	1.2

Table 5. Postoperative Complications

Complication	No. of Patients	%
Bleeding	20	24.1
Bleeding requiring reexploration	16	19.3
Neurocognitive problems	17	20.5
Cerebrovascular accident	4	4.8
Tachyarrhythmia	14	16.9
Acute renal failure	10	12.0
Wound infection	2	2.4
Respiratory complication	9	10.8
Perioperative myocardial infarction	4	4.8
Paravalvular leak	6	7.2
Mediastinitis	0	0
Endocarditis	0	0
Prosthetic valve malfunction	0	0
Thromboembolism	0	0

Classic Konno-Rastan Procedure: Indications and Results in the Current Era

Mohammad B Tabatabaie, MD, Alireza A Ghavidel, MD,
Mohammad A Yousefnia, MD, Saeed Hoseini, MD,
Seyed H Javadpour, FETCS, Kamal Raesi, MD



Dramatic reduction of the systolic TVG

91.3 ± 39.3 to 28.1 ± 17.7 mm Hg ($p < 0.001$)

Residual VSD 8.6%

CHB incidence 15.1%

Mortality rate 11.5%

Aortic root enlargement: What are the operative risks?

Jayesh Dhareshwar, MD,^a Thoralf M. Sundt III, MD,^a Joseph A. Dearani, MD,^a Hartzell V. Schaff, MD,^a
David J. Cook, MD,^b and Thomas A. Orszulak, MD^a



Post root
enlargement

Aortic root enlargement itself does not increase operative risk, although it is most often required among high-risk patients.

Surgeons should not be reluctant to enlarge the aortic root to permit implantation of adequately sized valve prostheses.

Routine Enlargement of the Small Aortic Root: A Preventive Strategy to Minimize Mismatch

Luis J. Castro, MD, Joseph M. Arcidi, Jr, MD, Audrey L. Fisher, BS, and
Vincent A. Gaudiani, MD

Department of Cardiovascular Surgery, Sequoia Hospital, Redwood City, California

**ARE can be performed readily and with
minimal added risk
relative to standard AVR.**

Long-term results of aortic valve replacement with posterior root enlargement

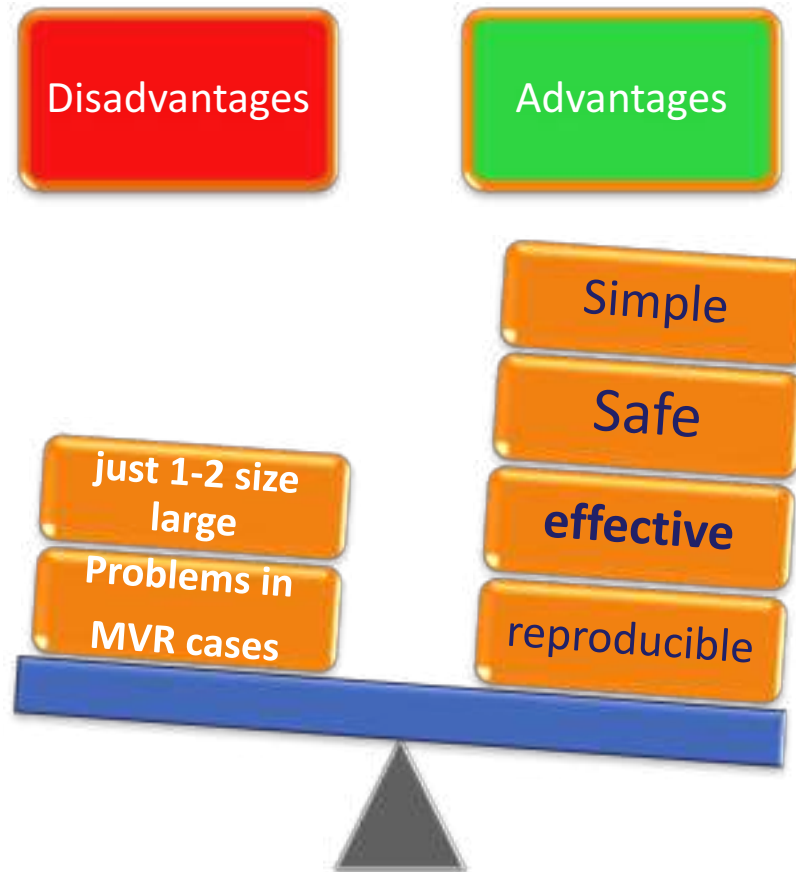
Alireza Alizadeh Ghavidel¹, Gholamreza Omrani²,
Mitra Chitsazan³, Ziae Totonchi⁴ and Nader Givtaj²

Redo
42%

Concomitant procedure
55%

Ealy mortality 6.9%

Late mortality 1.7%



Predictors of early mortality:
Female gender, Redo surgery, AOX>100 min and
concomitant procedures

Aortic valve replacement in geriatric patients with small aortic roots: are sutureless valves the future?[†]

Malakh Shrestha*, Ilona Maeding, Klaus Höffler, Nurbol Koigeldiyev, Georg Marsch, Thierry Siemeni, Felix Fleissner and Axel Haverich

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Abstract

OBJECTIVES: Aortic valve replacement (AVR) in geriatric patients (>75 years) with small aortic roots is a challenge. Patient-prosthesis mismatch and the long cross-clamp time necessary for stentless valves or root enlargement are matters of concern. We compared the results of AVR with sutureless valves (Sorin Perceval), against those with conventional biological valves.

METHODS: Between April 2007 and December 2012, 120 isolated AVRs were performed in patients with a small annulus (<22 mm) at our centre. In 70 patients (68 females, age 77.4 ± 5.5 years), conventional valves (C group) and in 50 patients (47 females, age 79.8 ± 4.5 years), sutureless valves (P group) were implanted. The Logistic EuroSCORE of the C group was 26.7 ± 10.4 and that of the P group 20.4 ± 10.7 , ($P = 0.054$). Minimal-access surgery

RESULTS: The cardiopulmonary bypass time was 30.1 ± 9 min in the P group, ($P < 0.001$) in the C group and 0 in the P group. P group, (n.s.).

Shorter AOX, CPB time
Greater EOA,
No need for root enlargement
Simplify Mini-AVR

14.2 min vs 58.7 ± 20.9 and
mortality was 4.3% ($n = 3$)
group and 14% ($n = 7$) in the

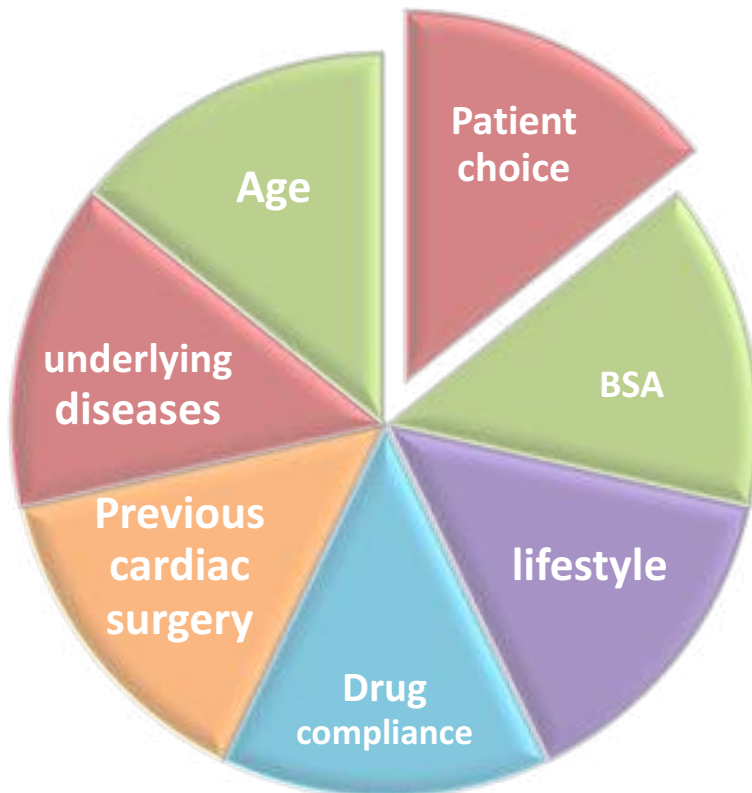
CONCLUSIONS: This study highlights the advantages of sutureless valves for geriatric patients with small aortic roots reflected by shorter cross-clamp and CPB times, even though most of these patients were operated on via a minimally invasive access. Moreover, due to the absence of a sewing ring, these valves are also almost stentless, with greater effective orifice area (EOA) for any given size. This may potentially result in better haemodynamics even without the root enlargement. This is of advantage, as several studies have shown that aortic root enlargement can significantly increase the risks of AVR. Moreover, as seen in this series, these valves may also enable a broader application of minimally invasive AVR.

Keywords: Small aortic root • Elderly patients • Aortic valve stenosis • Sutureless aortic valve

(Surgical plan)

Patient factors

Surgeon's judgment

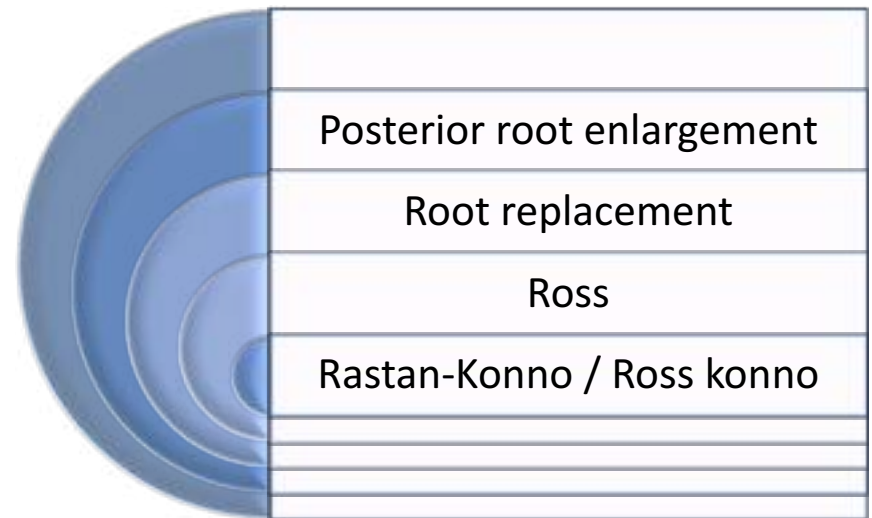
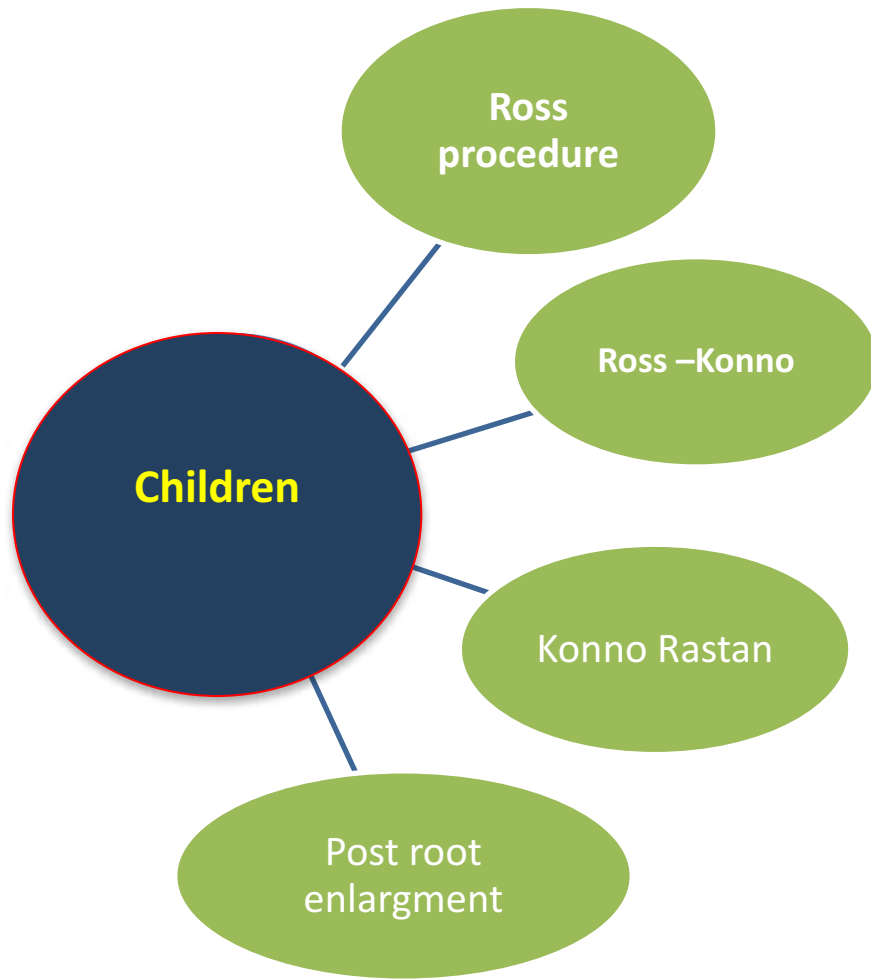


Availability of devices

Surgeon's experience

GEOA of prosthesis

Surgical options



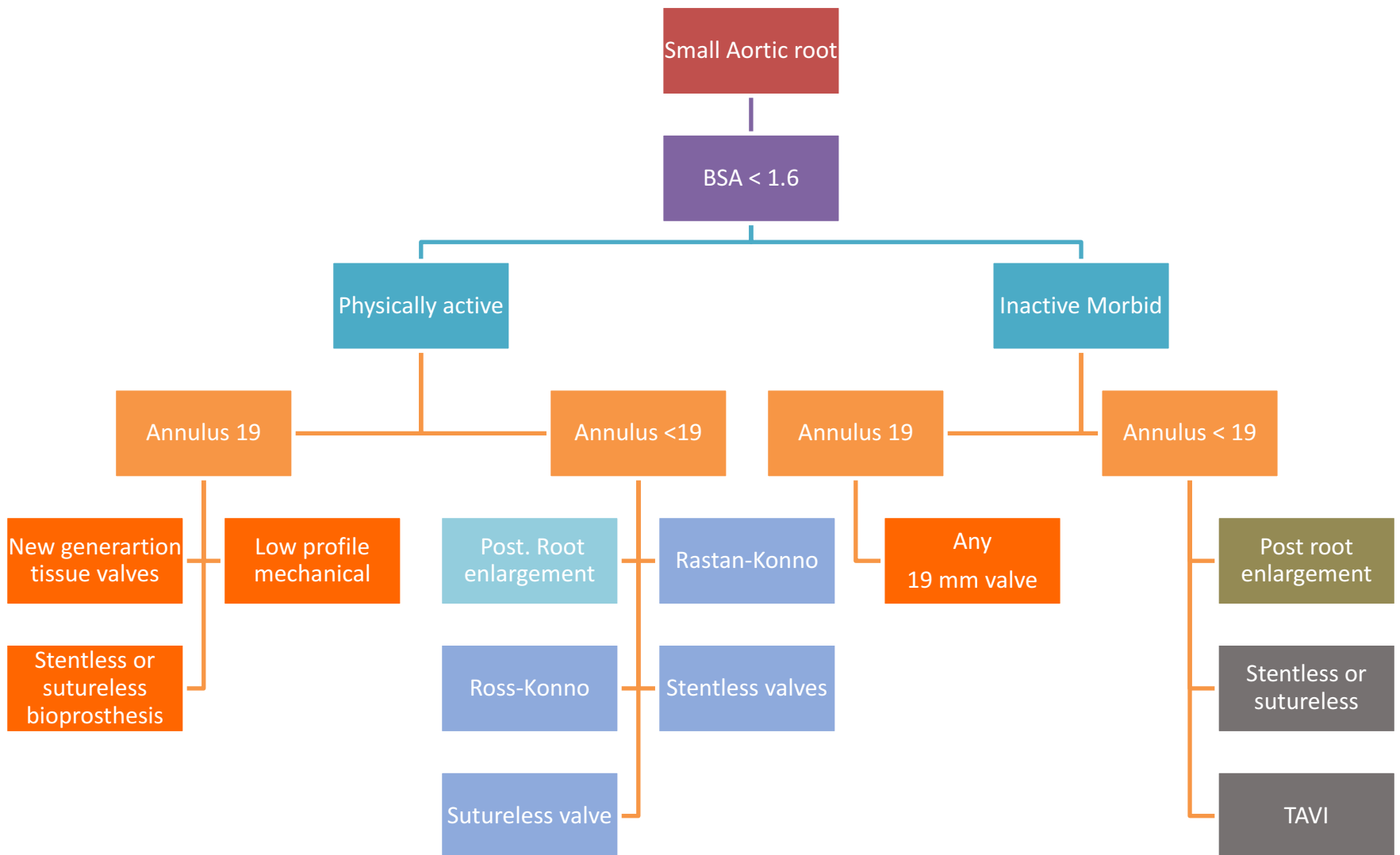
Old Ages

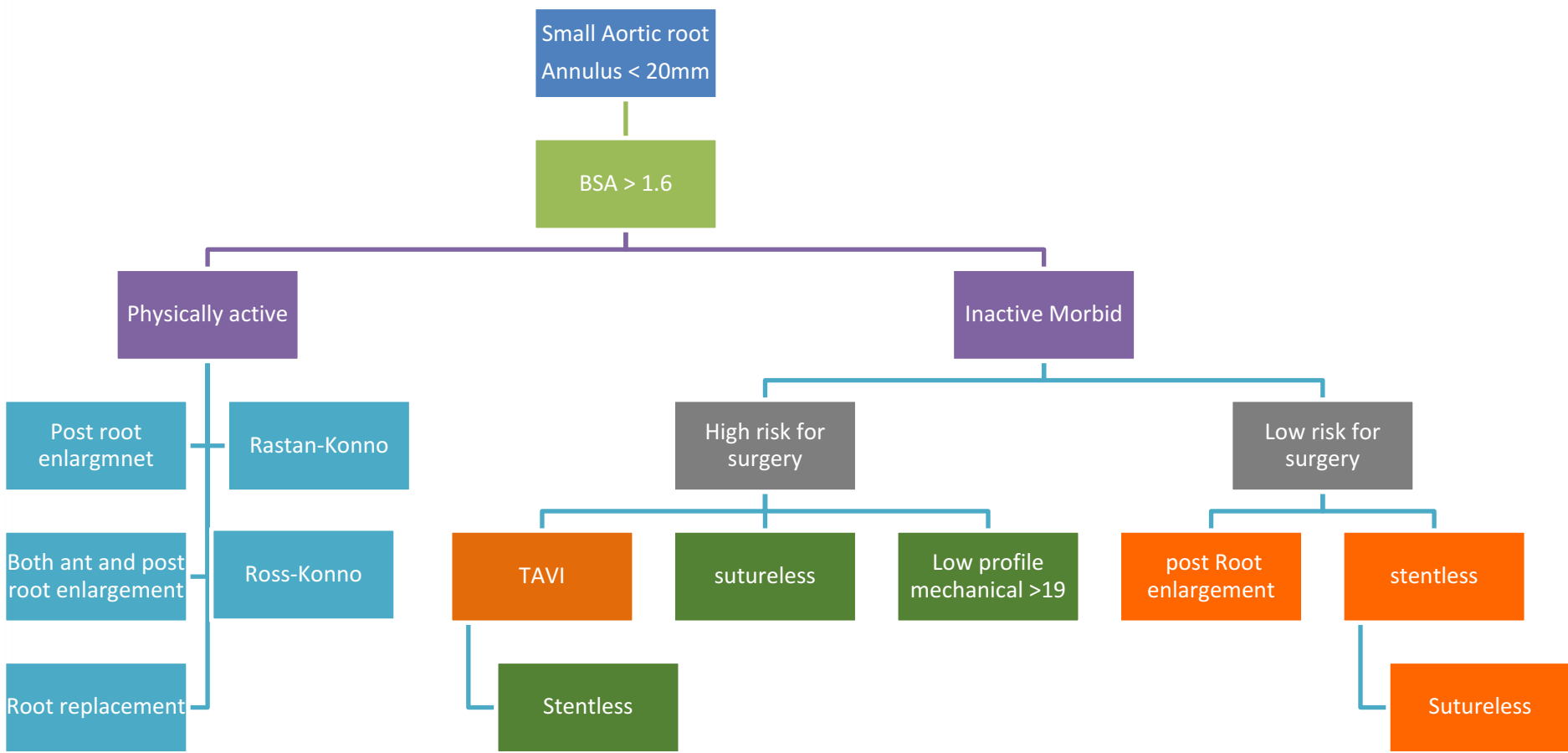
**New generation
bioprosthesis**

Stentless tissue valves

Sutureless bioprosthesis

Manouagian







Take home message

An IE OA less than $0.65 \text{ cm}^2/\text{m}^2$ should be avoided in all cases

An IE OA between 0.65 and $0.85 \text{ cm}^2/\text{m}^2$ should be determined by

considering multiple factors

It should be addressed by a suitable root enlarging technique in young active and old low risk patients

Low profile prosthesis, stentless or sutureless tissue valves and TAVI are good alternative in high risk patients and could be ignored.

Moderate degrees of p-p mismatch can be ignored in most cases of high risk or low life expectancy



