Surgical Repair of a Regurgitant Aortic Valve: When, How and Why?

Michael A. Borger, MD PhD

Director of University Clinic of Cardiac Surgery

Medical Director

Leipzig Heart Center

UNIVERSITÄT LEIPZIG

Helios

Helios Health Institute

Disclosures

My hospital receives speakers' honoraria / consulting fees on my behalf from:

- Edwards Lifesciences
- Medtronic
- Abbott
- Artivion

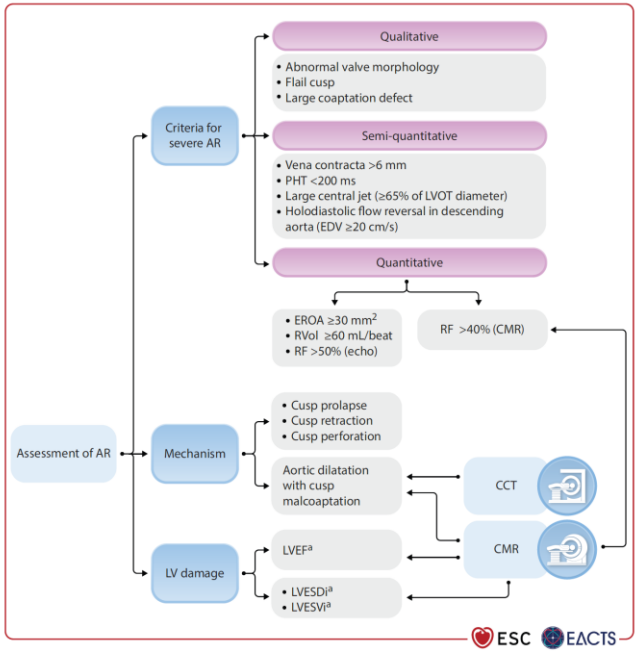
Surgical AV Repair: When?

2025 ESC/EACTS Guidelines for the management of valvular heart disease

Developed by the task force for the management of valvular heart disease of the European Society of Cardiology (ESC) and the European Association for Cardio-Thoracic Surgery (EACTS)

Authors/Task Force Members:

Fabien Praz (ESC Chairperson) (Switzerland), Michael A. Borger (EACTS Chairperson) (Germany), Jonas Lanz (ESC Task Force Co-ordinator) (Switzerland), Mateo Marin-Cuartas (EACTS Task Force Co-ordinator) (Germany), Ana Abreu (Portugal), Marianna Adamo (Italy), Nina Ajmone Marsan (Netherlands); Fabio Barili (Italy), Nikolaos Bonaros (Austria), Bernard Cosyns (Belgium), Ruggero De Paulis (Italy),Habib Gamra (Tunisia), Marjan Jahangiri (United Kingdom), Anders Jeppsson (Sweden),Robert J.M. Klautz (Netherlands), Benoit Mores (Belgium), Esther Pérez-David (Spain), Janine Pöss (Germany), Bernard D. Prendergast (United Kingdom), Bianca Rocca (Italy), Xavier Rossello (Spain), Mikio Suzuki (Serbia), Holger Thiele (Germany), Christophe Michel Tribouilloy (France), Wojtek Wojakowski (Poland).



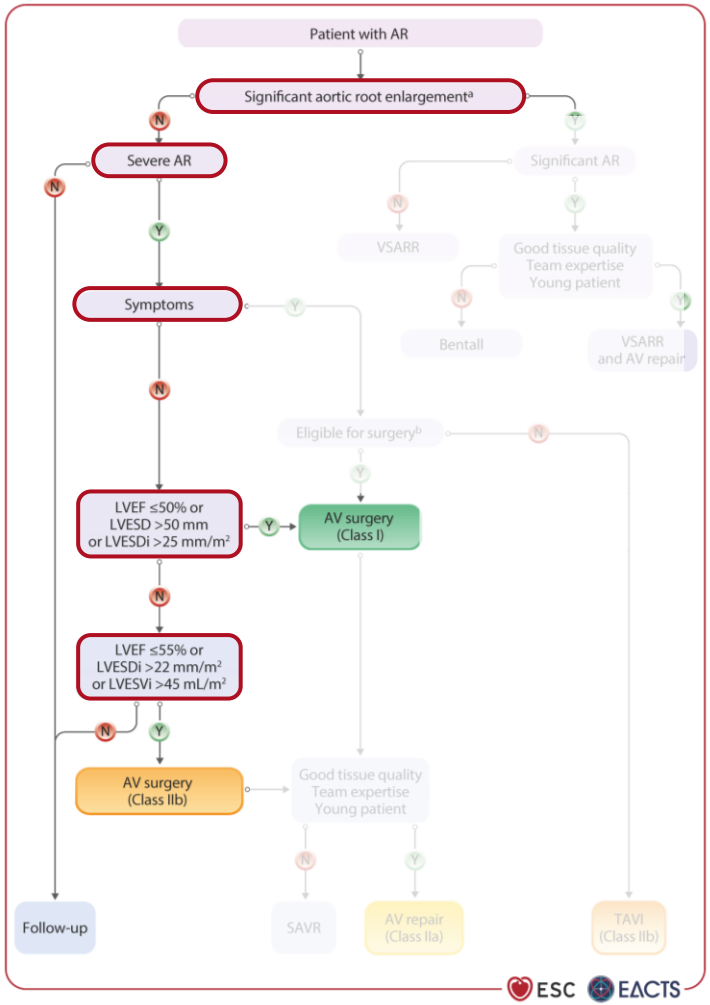
AR: Indications for intervention

Significant aortic root enlargement?

Severity of AR?

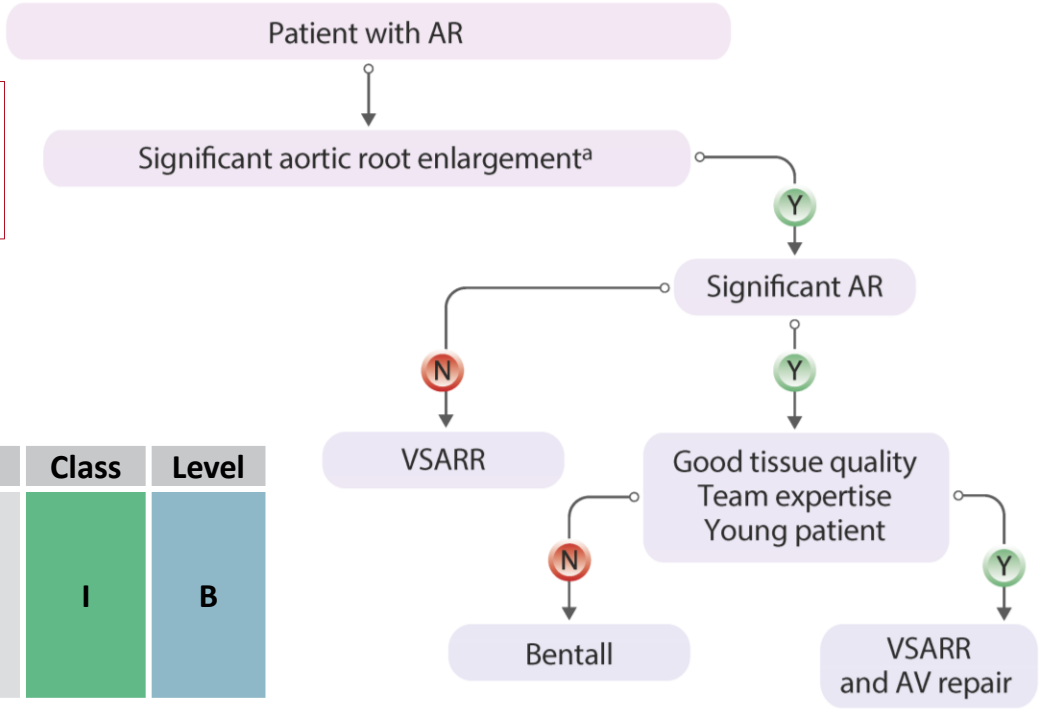
Symptoms?

Left ventricular damage?



Management of patients with significant root enlargement +/- AR

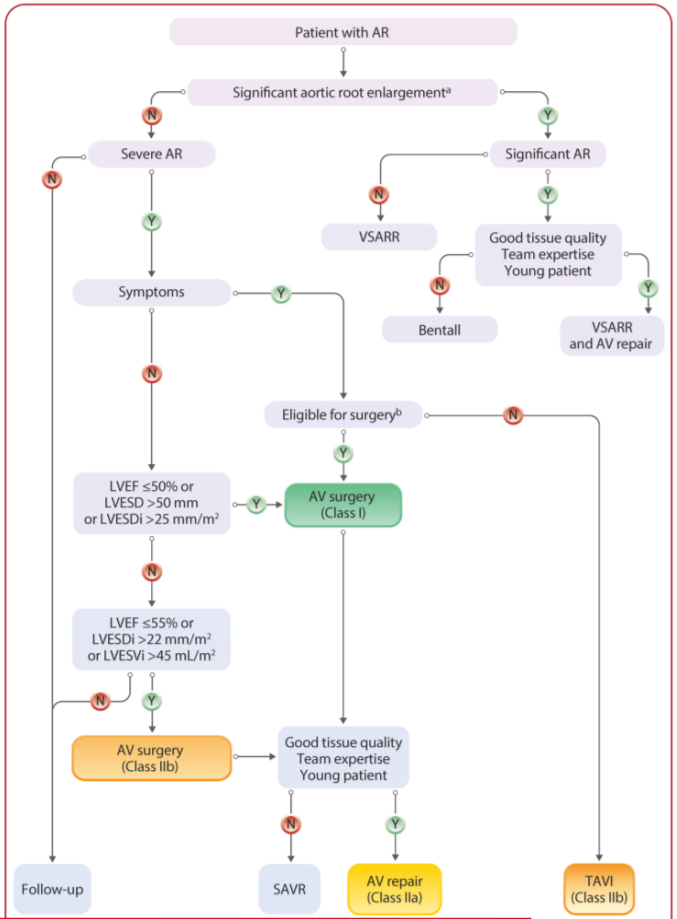
2024 ESC Guidelines for the management of peripheral arterial and aortic diseases



Recommendation	Class	Level
Valve-sparing aortic root replacement is recommended in young patients with aortic root dilatation at experienced centres, when durable results are expected.	I	B

Management of isolated AR

Recommendations	Class	Level
AV surgery is recommended in symptomatic patients with severe AR regardless of LV function.	I	B
AV surgery is recommended in asymptomatic patients with severe AR and LVESD >50 mm or LVESDi >25 mm/m^2 [especially in patients with small body size (BSA <1.68 m^2)] or resting LVEF ≤50%.	I	B
AV surgery may be considered in asymptomatic patients with severe AR and LVESDi >22 mm/m^2, LVESVi >45 mL/m^2 [especially in patients with small body size (BSA <1.68 m^2)], or resting LVEF ≤55%, if the surgical risk is low.	IIb	REV. B

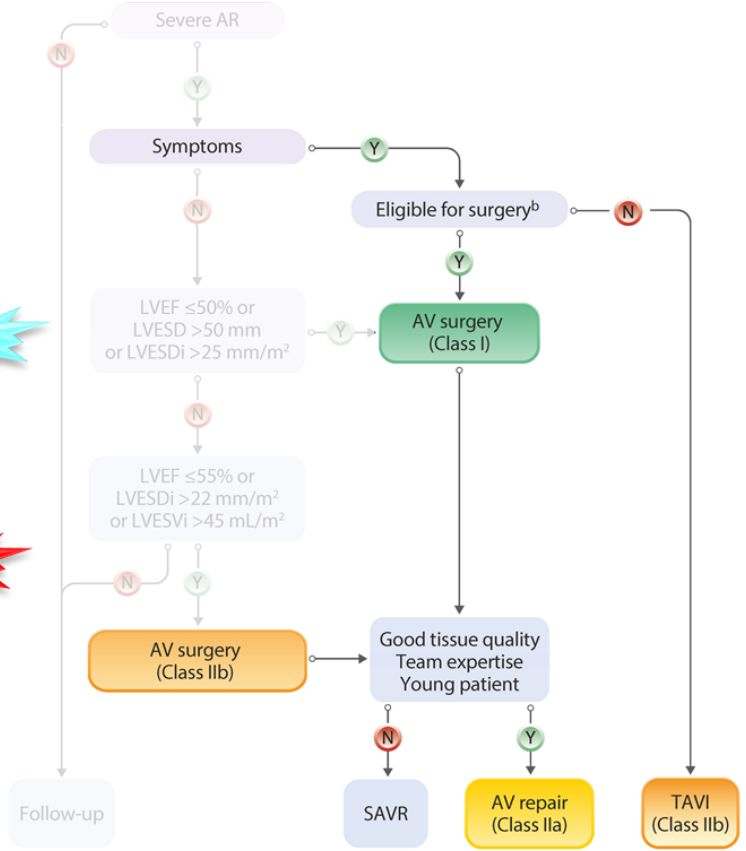


Implementation of a volume cuf-off based echocardiography or cardiac MRI

EACTS

Mode of intervention for severe aortic regurgitation

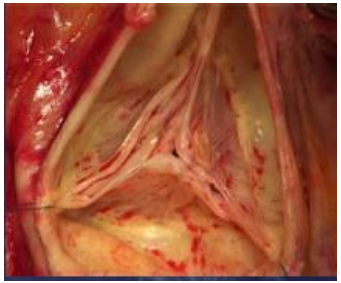
Recommendations	Class	Level
AV repair should be considered in selected patients with severe AR at experienced centres, when durable results are expected.	IIa	B REV.
TAVI may be considered for the treatment of severe AR in symptomatic patients ineligible for surgery according to the Heart Team, if the anatomy is suitable.	IIb	B NEW

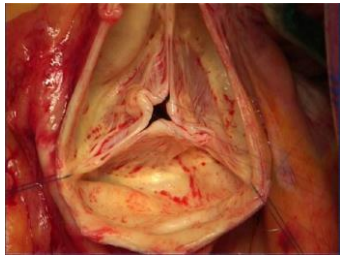


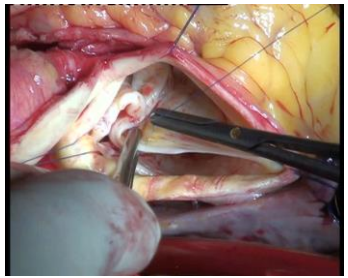
Surgical (isolated) AV Repair: How?

Surgical (isolated) AV Repair: How?

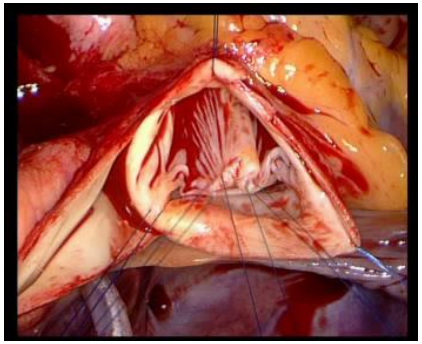
Cusp Plication

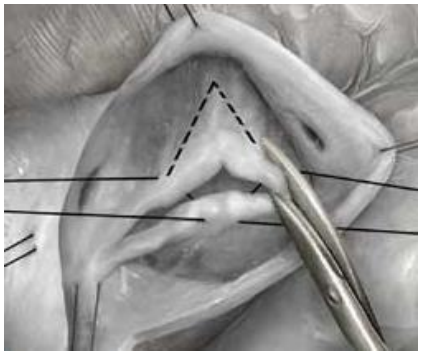




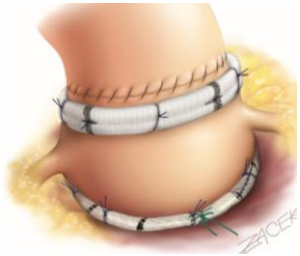


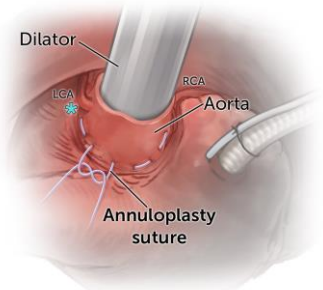
Cusp Resection



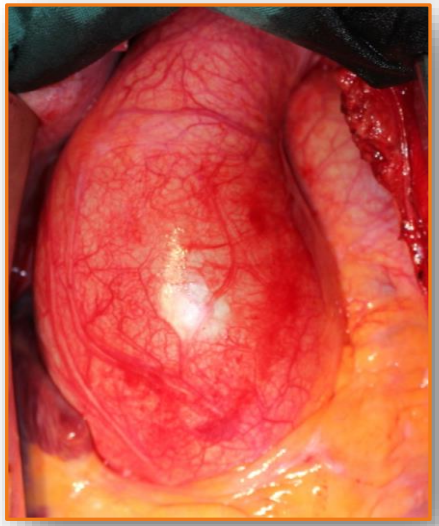


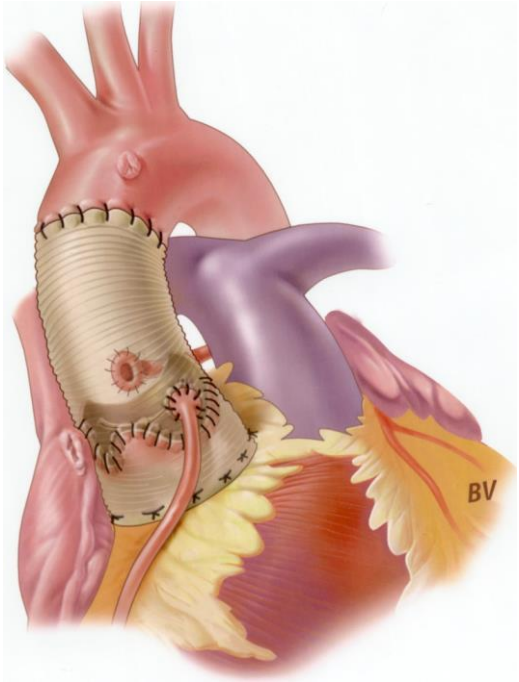
AV Annuloplasty

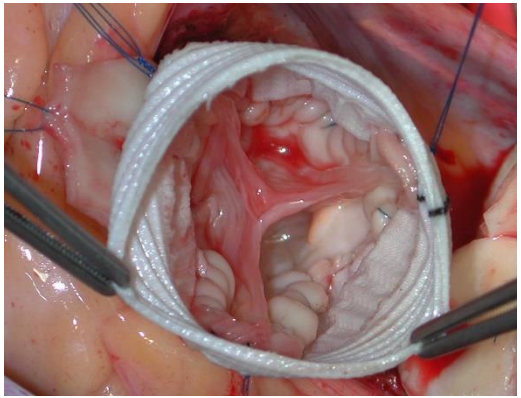




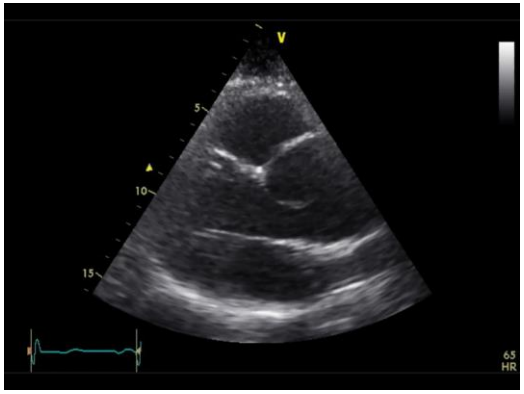
Surgical (ascending aorta +) AV Repair: How?

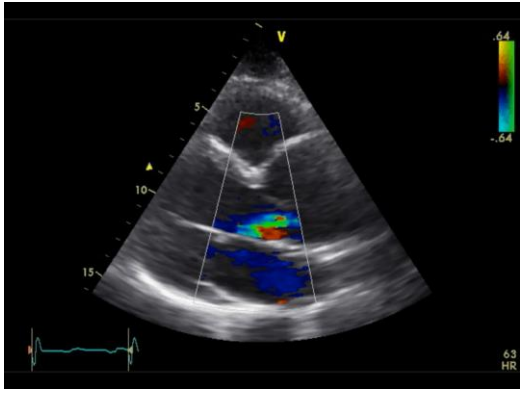




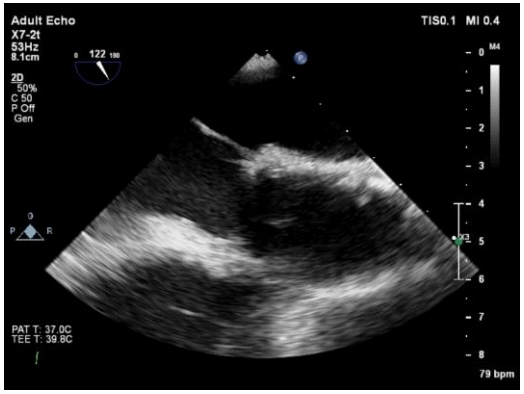


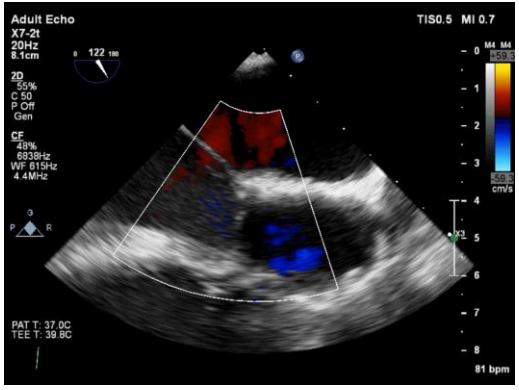
Pre- and Post-David Operation Echos





preop





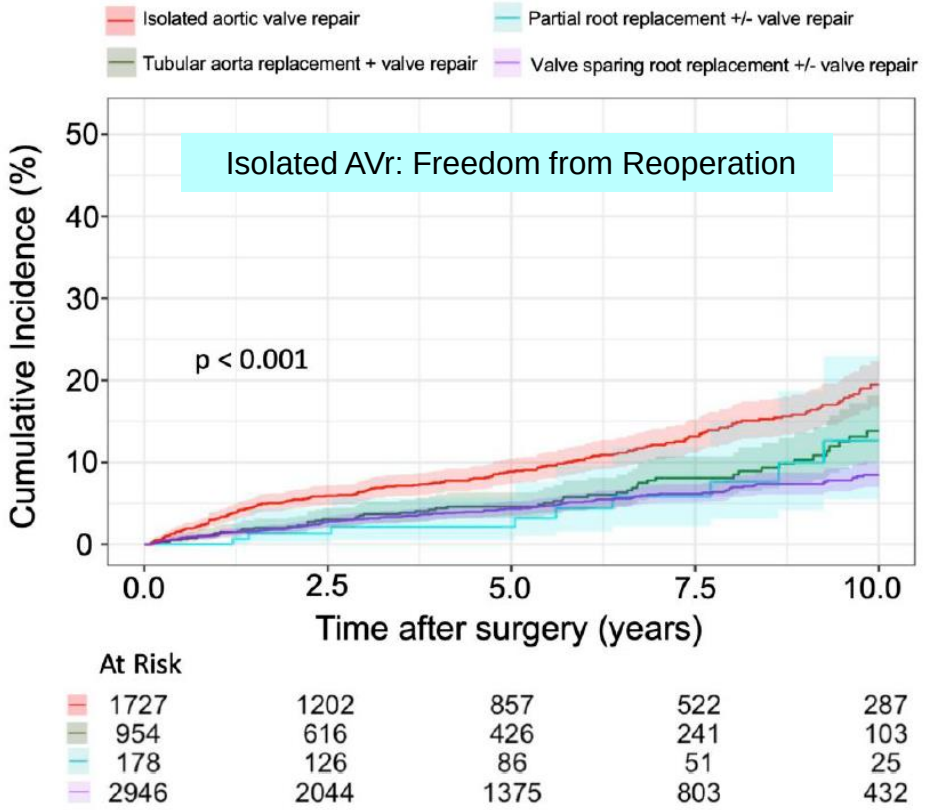
postop

Surgical (isolated) AV Repair: Why?

Aortic valve repair in adults: long-term clinical outcomes and echocardiographic evolution in different valve repair techniques

Francesco Zito[a,b], Kevin M. Veen[a], Giovanni Melina[b], Emmanuel Lansac[c], Hans-Joachim Schäfers[d], Laurent de Kerchove[e], Johanna J.M. Takkenberg[a], Jolanda Kluin[a] and M. Mostafa Mokhles[f,*]

EJCTS 2025;67:ezaf020



Surgical (ascending aorta +) AV Repair: Why?

Valve-Sparing Root Replacement Compared With Composite Valve Graft Procedures in Patients With Aortic Root Dilation

Maral Ouzounian, MD, PhD, Vivek Rao, MD, PhD, Cedric Manlhiot, PhD, Nachum Abraham, MSc, Carolyn David, RN, Christopher M. Feindel, MD, MSc, Tirone E. David, MD

ABSTRACT

BACKGROUND Although aortic valve-sparing (AVS) operations are established alternatives to composite valve graft (CVG) procedures for patients with aortic root aneurysms, comparative long-term outcomes are lacking.

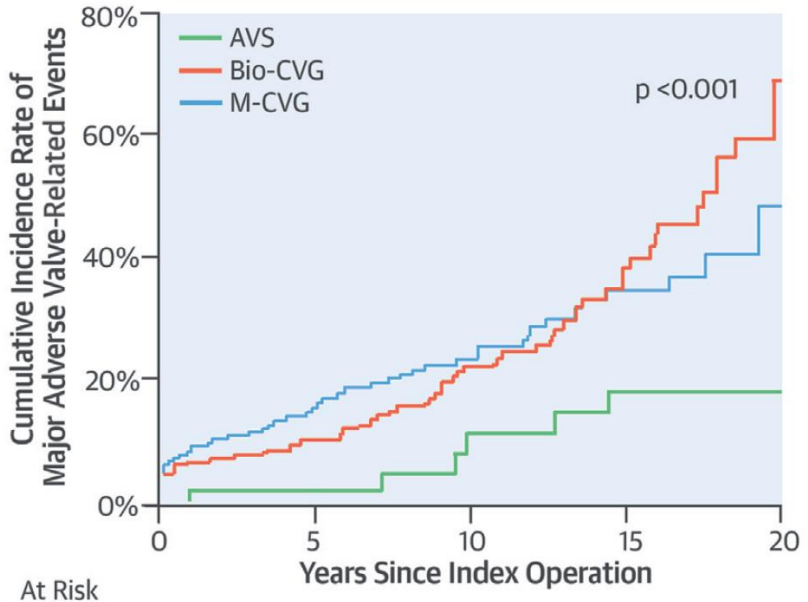
OBJECTIVES This study sought to compare the results of patients undergoing AVS procedures with those undergoing CVG operations.

METHODS From 1990 to 2010, a total of 616 patients age <70 years and without aortic stenosis underwent elective aortic root surgery (AVS, n = 253; CVG with a bioprosthesis [bio-CVG], n = 180; CVG with a mechanical prosthesis [m-CVG], n = 183). A propensity score was used as a covariate to adjust for unbalanced variables in group comparisons. Mean age was 46 ± 14 years, 83.3% were male, and mean follow-up was 9.8 ± 5.3 years.

RESULTS Patients undergoing AVS had higher rates of Marfan syndrome and lower rates of bicuspid aortic valve than those undergoing bio-CVG or m-CVG procedures. In-hospital mortality (0.3%) and stroke rate (1.3%) were similar among groups. After adjusting for clinical covariates, both bio-CVG and m-CVG procedures were associated with increased long-term major adverse valve-related events compared with patients undergoing AVS (hazard ratio [HR]: 3.4, p = 0.005; and HR: 5.2, p < 0.001, respectively). They were also associated with increased cardiac mortality (HR: 7.0, p = 0.001; and HR: 6.4, p = 0.003). Furthermore, bio-CVG procedures were associated with increased risk of reoperations (HR: 6.9; p = 0.003), and m-CVG procedures were associated with increased risk of anticoagulant-related hemorrhage (HR: 5.6; p = 0.008) compared with AVS procedures.

CONCLUSIONS This comparative study showed that AVS procedures were associated with reduced cardiac mortality and valve-related complications when compared with bio-CVG and m-CVG. AVS is the treatment of choice for young patients with aortic root aneurysm and normal or near-normal aortic cusps. (J Am Coll Cardiol 2016;68:1838–47)

David Operation vs Bio Bentall: Major Adverse Valve-Related Events



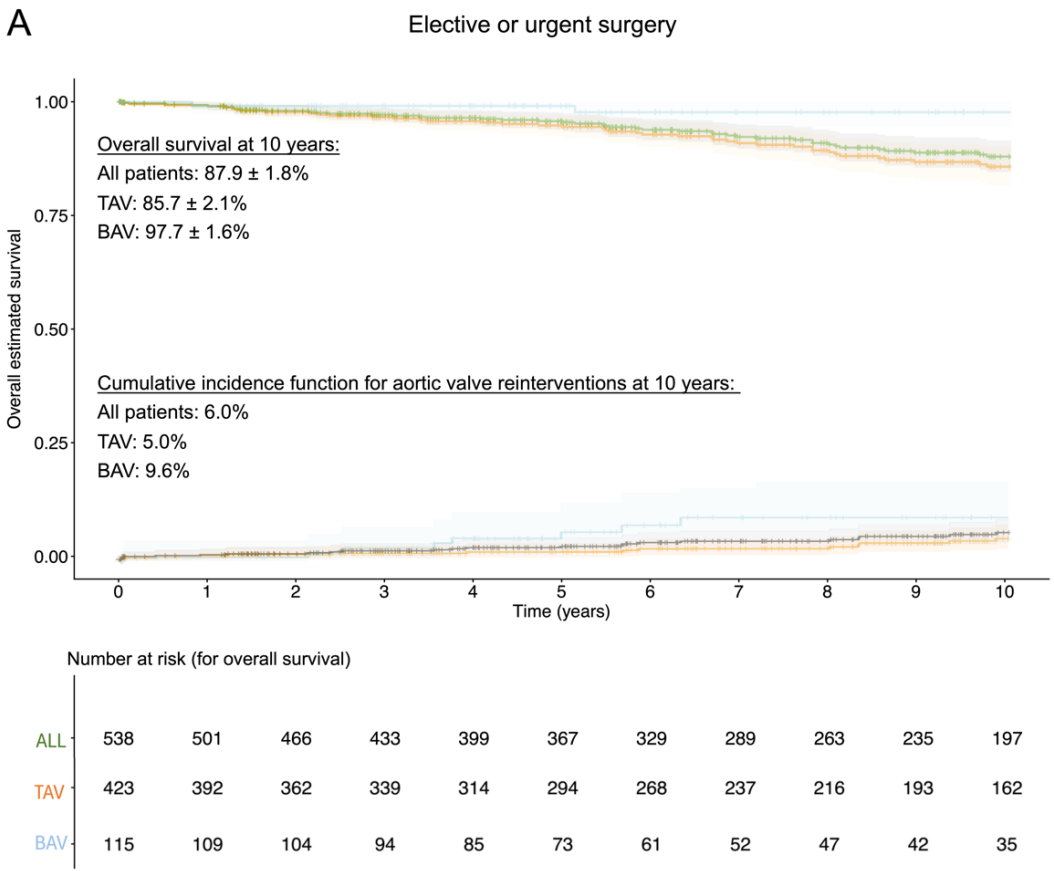
Red = biologic Bentall

Blue = mechanical Bentall

Green = David OP

Ouzounian et al, JACC 2016;68:1838-47

Surgical (ascending aorta +) AV Repair: Why?



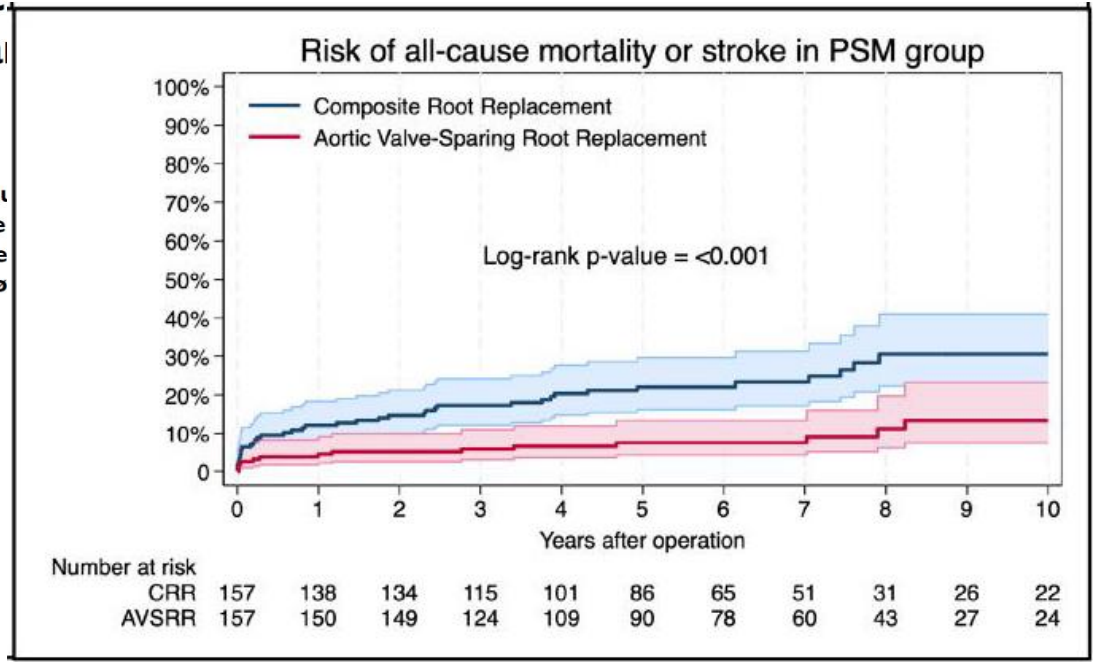
Surgical (ascending aorta +) AV Repair: Why?

ESC European Society of Cardiology
European Heart Journal Open (2025) **5**, oeaf112
https://doi.org/10.1093/ehjopen/oeaf112

ORIGINAL ARTICLE
Interventional cardiology and cardiac surgery

Aortic valve-sparing root replacement, and composite root replacement: a Da multicentre nationwide study

Emil Johannes Ravn [1,2,*,†], Lytfi Krasniqi [1,3,†], Viktor Poulsen[1], Poul Erik Mortensen[1], Bo Juel Kjeldsen[1], Jens Lund[1], Kristian Øvreh Oke Gerke [3,4], Rasmus Carter-Storch [2], Morten Holdgaard Sme Ivy Susanne Modrau[6,7], Torsten Bloch Rasmussen[8], Katrine M. Mülle Marie-Annick Clavel [2], Jordi Sanchez Dahl[2,10], and Lars Peter Schø




Thank you !
•michael.borger@helios-gesundheit.de