

Severe Aortic Stenosis and Moderate Mitral Regurgitation

**ACC, ASE, STS
Heart Valve Summit
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Disclosures

- **Consultant**
 - Edwards Lifesciences
 - Intuitive Surgical
 - Scanlan International
- **Scientific Advisory Board**
 - ATS – arrhythmia management



AS and MR

Austen GW, Kastor JA, Sanders CA. **Resolution of functional mitral regurgitation following surgical correction of aortic valvular disease.**

J Thorac Cardiovasc Surg 1967;53:255-259

Lack of Improvement in Coexisting Mitral Regurgitation After Relief of Valvular Aortic Stenosis

Peter B. Adams, BS, and Catherine M. Otto, MD

Am J Card 1990;66:105-107



Pathophysiology of AS

- LV outflow Obstruction
- ↑ LV systolic pressure
 - Concentric hypertrophy, ↑ LV thickness, Normal LV volume
 - ↑ LV thickness
 - Compensates for ↑ LVSP → normalizes wall stress
 - ↓ LV volume/mass ratio, ↓ compliance, ↑ LVEDP, ↑ O₂ demand
 - ↑ LV ejection time
 - ↓ diastolic time → ↓ O₂ supply
 - ↑ LV diastolic pressure
 - ↓ aortic (systemic) pressure



Pathophysiology of AS & MR

- MR volume dependent on
 - Instantaneous size of regurgitant orifice
 - LV-LA pressure gradient
- AS accentuates MR
 - \uparrow LV-LA gradient by \uparrow LVSP, \uparrow LVEDP, \uparrow LV Ejection Time
- MR - deleterious effect on the AS compensated heart
 - \downarrow LV preload in preload dependent heart
 - \downarrow forward CO, \uparrow LAP and PVP



Aortic Valve Replacement: AS & MR

- AVR
 - Normalize LVSP, LVEDP, LV Ejection Time
 - ↓ LV-LA pressure gradient
 - Reduce MR
- In whom do we need to intervene?
 - Mild – No
 - Severe – Yes
 - Moderate???

AS + Ischemic / Functional MR

Does moderate mitral regurgitation impact early or mid-term clinical outcome in patients undergoing isolated aortic valve replacement for aortic stenosis?[☆]

B. Absil, F. Dagenais*, P. Mathieu, J. Métras, J. Perron, R. Baillet, R. Bauset, D. Doyle

Department of Cardiovascular Surgery, Québec Heart Institute, Laval Hospital, Laval University, 2725 chemin Sainte-Foy, Sainte-Foy, Canada G1V 4G5

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- 43/58 (74%) 2-3MR improved to 0-1MR at 1 year
- No difference in survival and event free survival

AS + Ischemic / Functional MR

Effect of Aortic Valve Replacement for Aortic Stenosis on Severity of Mitral Regurgitation

Frédéric Vanden Eynden, MD, Denis Bouchard, MD, Ismail El-Hamamsy, MD, Ady Butnaru, MD, Philippe Demers, MD, Michel Carrier, MD, Louis P. Perrault, MD, Jean-Claude Tardif, MD, and Michel Pellerin, MD

Department of Cardiac Surgery, Free University of Brussels, Brussels, Belgium; and Departments of Cardiovascular Surgery and Medicine, Montreal Heart Institute, Montreal, Quebec, Canada

- “There was little improvement in the rheumatoid and myxomatous group...”
- “The most important improvement was seen in the ischemic group...” 14/26 (54%)

AS + Ischemic / Functional MR

Natural History and Predictors of Outcome in Patients With Concomitant Functional Mitral Regurgitation at the Time of Aortic Valve Replacement

Marc Ruel, MD, MPH; Varun Kapila, MD; Joel Price, MD; Alexander Kulik, MD;
Ian G. Burwash, MD; Thierry G. Mesana, MD, PhD

- Risk factors for persistent MR and CHF with Functional MR $\geq 2+$
 - LA diameter > 5 cm
 - Pre-op peak aortic gradient < 60 mmHg
 - Atrial fibrillation

AS + Ischemic / Functional MR

Changes in Mitral Regurgitation After Replacement of the Stenotic Aortic Valve

Emily C. Waisbren, BS, Louis-Mathieu Stevens, MD, SM, Edwin G. Avery, MD, Michael H. Picard, MD, Gus J. Vlahakes, MD, and Arvind K. Agnihotri, MD

Division of Cardiac Surgery, Cardiac Anesthesia Division, Department of Anesthesia and Critical Care, and Cardiology Division, Massachusetts General Hospital Heart Center, Boston, Massachusetts

- Predictors for improvement of MR post AVR
 - Smaller LA diameter
 - Presence of preoperative CHF
 - Presence of preoperative AI

AS + Ischemic / Functional MR

Incidence, associated factors and evolution of non-severe functional mitral regurgitation in patients with severe aortic stenosis undergoing aortic valve replacement

Juan Caballero-Borrego^{*}, Juan José Gómez-Doblas, Fernando Cabrera-Bueno, José Manuel García-Pinilla, José María Melero, Carlos Porras, Eduardo Olalla, Eduardo De Teresa Galván

- Predictors for improvement of MR post AVR
 - Coronary lesions ($p = 0.038$)
 - Absence of diabetes ($p = 0.011$)
 - Pulmonary hypertension ($p = 0.046$)

AS + Ischemic / Functional MR

Factors Determining Early Improvement in Mitral Regurgitation after Aortic Valve Replacement for Aortic Valve Stenosis: A Transthoracic and Transesophageal Prospective Study

SOPHIE TASSAN-MANGINA, M.D., DAMIEN METZ, M.D., PIERRE NAZEYROLLAS, M.D., FRÉDÉRIC TOROSSIAN, M.D.,* CAMELIA POP, M.D., BERTRAND JAMET, M.D., BERNARD BAEHREL, M.D.,* JACQUES ELAERTS, M.D.

Departments of Cardiology and *Cardiac Surgery, University Hospital, Reims, France

- Mitral calcifications and/or left atrial dilation seem to be predictive factors of fixed MR.

AS and Moderate MR

In whom do we need to intervene?

Functional/Ischemic MR

1. Treat conservatively < 2+
2. Individual basis
3. Depends on LA size, presence of CHF, concomitant AI, AS gradient, presence of MAC, atrial fibrillation, coronary disease, pulmonary hypertension, diabetes

Structural MR

All require repair/replacement

