Surgical Treatment of Left Ventricular Outflow Tract Obstruction: How WE Do It

Douglas R Johnston, MD
Vice Chairman, Thoracic and Cardiovascular Surgery
Surgical Director, Aortic Valve Center

Cleveland Clinic
Disclosures

• Edwards Lifesciences - Consultant, Investigator
• Abbot – Consultant
• LivaNova – Consultant, Investigator
• Cryolife – Consultant, Investigator
• WL Gore - Investigator
Objectives

• What are the operative considerations for managing LVOT obstruction

• When is myectomy vs alternative procedures indicated and how do we do it?
16 y.o. with severe LVOTO

2.8 cm Septal thickness
50 yo with numerous episodes of near syncope and exercise induced SAM with gradient of 182 mm Hg. MRI report “no LVH”.
60 yo with long anterior leaflet and a septum of 15 mm.
Patients

January 2005 – December 2015
1,549 patients
1,559 operations
Preoperative LVOT Gradients

LVOT Gradient (mmHg)

- Resting
- Valsalva
- Amyl Nitrate
- Exercise

Graph showing the LVOT gradient at different conditions: Resting, Valsalva, Amyl Nitrate, and Exercise. The LVOT gradient is highest during Exercise and lowest at Resting.
Operations Performed

- **Isolated Septal Myectomy**: 586 (38%)
- **Isolated Mitral Valve Intervention**: 522 (33%)
- **Myectomy with Mitral Valve Intervention**: 422 (27%)
- **Myectomy with Other Procedure**: 2%
Operations Performed

- Isolated Septal Myectomy: 586
- Myectomy with Mitral Valve Intervention: 422
- Myectomy with Other Procedure: 522
- Isolated Mitral Valve Intervention: 29
Mass of Myocardium Removed by Mitral Valve Intervention

P < 0.001

Mass of Myocardium Removed (g)

None

Any Mitral Valve Intervention

P < 0.001
Isolated Myectomy

Myectomy and Mitral Valve Repair
Likelihood of Mitral Valve Intervention by Preoperative Septal Thickness

- ≤15mm (n=257)
- 15-18mm (n=389)
- >18mm (n=898)
Septal Thickness by Mitral Valve Intervention

None
Chordae Resection
Papillary Muscle Resection
Anterior Mitral Valve Shortening

≤15mm
15-18mm
>18mm
Mortality

- All Patients
- Isolated Septal Myectomy
- Myectomy with Mitral Valve Intervention
- Myectomy with Other Procedure
Conclusions

• Increasing recognition and diagnosis of LVOTO.
• Causes are multifactorial.
• Ventricular geometry and morphology are quite variable.
Conclusions

• With experience LVOTO can be safely and quickly treated with very low rates of VSD, pacemaker and mortality.

• Selective use of MV repairs can enhance the safety and efficacy of LVOTO surgery, especially early in the surgeon’s learning curve and avoid MVR in patients with minimal septal hypertrophy.