LVOT OBSTRUCTION AFTER TRANS Catheter MITRAL VALVE REPLACEMENT INSIDE A RING

NYU WINTHROP HOSPITAL
Dr. Richard Schwartz
Dr. Khaled Salhab
Dr. John Shenouda
Dr. Hafiz Hussain

Case Objectives

◊ To understand possible hemodynamic changes that occur after Trans-catheter Mitral Valve in Ring procedure
◊ To assess the need for therapies to improve LVOT obstruction in the acute setting including ETOH Septal ablation
◊ To use a heart team approach in order to assess the need for surgery or additional peripheral procedures
Presentation

67 year old female with a Past Medical History of:

- HTN
- HLD
- Paroxysmal Atrial Fibrillation on Coumadin
- CAD s/p one vessel CABG (LIMA to the mid-LAD) February 2016
- Mitral valve repair with a ring, MAZE procedure and ligation of left atrial appendage with clip in February 2016.
- Pacemaker for symptomatic bradycardia.

Presentation

- She cannot climb one flight of stairs without experiencing breathlessness and overall discomfort. Worsened over the last couple of months
- TEE (9/2017) reported normal LV systolic function, moderate-severe mitral regurgitation with tethering of the posterior leaflet of the mitral valve, and mild to moderate tricuspid regurgitation
- Cardiac catheterization (12/2017) demonstrated 3+ mitral regurgitation, EF equals 55%, intact previous LIMA-LAD coronary artery bypass graft, and pulmonary hypertension
Procedure

- Due to her symptoms, Mitral Replacement was the therapy of choice.
- STS Score was calculated at 7.9%; given that this would be a re-operation.
- Decision was made to proceed with a Transcatheter mitral valve replacement in order to help with her symptoms.
Procedure

◊ Venous access was obtained from the right femoral approach and a transeptal puncture was performed using a BRK-1 transeptal needle; Antegrade crossing of the Mitral Valve was obtained using a 5F diagnostic multipurpose catheter over a j-wire.

◊ A confida wire was placed through the multipurpose and across the septum. This was followed by a 12 * 60 non-complaint ATLAS balloon to expand the septostomy

◊ Lastly, A 26 mm Edwards Sapien 3 valve was used and successfully placed in the mitral position after a short pacing run at a rate of 180 BPM.

Post Procedure

◊ A routine TEE was performed after the deployment of the valve. There was trace paravalvular mitral regurgitation visualized

◊ The mean gradient across the Sapien valve in the mitral position was 5 mm Hg.
Post procedure

- Turbulent flow was noted in the LVOT; In the trans-gastric apical 5 view, a peak velocity of 4.98 m/sec was noted, corresponding to a peak gradient of 99 mm Hg, and a mean gradient of 56 mm Hg
- The basal septum was measured at 1.5 cm, and it was noted that a narrowing of the LVOT was visible, approx. 1.6 cm from the aortic valve. This narrowing was produced by the sapien valve, and the basal septum
Post Procedure

◊ Patient then underwent an invasive hemodynamic Assessment. There was a resting peak to peak LVOT Gradient of 73 mmHg (LV 205 to AO 132).
◊ A brockenbrough maneuver was performed and there was a provocable gradient of 134 mmHg.
◊ Patient’s HR was 60 BPM and LVEDP was 21 mmHg.
Post Procedure

◊ Given severe LVOTO; a heart team approach was taken between the surgeon in the room, another mitral valve surgeon who specializes in mitral valves, the interventionist and consultation with a HCM expert

◊ The decision was made to pursue an alcohol septal ablation in order to decrease the LVOTO

◊ The Left Coronary artery was engaged with a JL4 catheter. The first septal was wired with an Allstar wire and an OTW balloon was placed there and inflated. 1 cc of contrast was injected and the basal septum subsequently became bright on TEE. This was followed by 1 cc of dehydrated Alcohol.
Echo
Post-Procedure

Results

❖ After the ETOH ablation the patients Peak to peak resting gradient came down to 49 mmHG and the provicable gradient with the Brockenbrough maneuver was 81 mmHG.
❖ Patient had an impella placed in case there was any edema that develops around the LVOT overnight
Take Home Points

◊ Consider All Hemodynamics after performing A TMVR including the LVOT gradients
◊ Current TMVR valves are circular in shape and are therefore not optimal for the mitral position and can cause LVOTO
◊ Consider an alcohol septal ablation as a means to decrease severe LVOTO if the septum is enlarged
◊ Have a heart team discussion when unexpected events occur