

## **Valvular Repair and Heart Failure**

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### **Story from the Front Lines:**

A man in his 60s with mixed ischemic and non-ischemic cardiomyopathy presented from an outside-facility for ongoing management of heart failure. Historically, the patient had a stable ejection fraction (EF) of 30-35% with mild mitral regurgitation, was largely asymptomatic (New York Heart Association class I), and was in sinus rhythm since successful atrial fibrillation ablation several years prior. Recently, however, the patient's heart failure had become more symptomatic, EF had worsened to 20-25%, mitral regurgitation had become moderate-to-severe, and atrial fibrillation had recurred. He was electively admitted to the outside hospital for cardiac surgery and underwent mitral valve annuloplasty, tricuspid valve annuloplasty, left atrial appendage ligation, left atrial cryoablation (MAZE procedure), and placement of a left ventricular pacer lead. The post-operative course was complicated by severe cardiogenic shock (EF <10%) requiring multiple inotropes and vasopressors. After several weeks of management, the patient was transferred for continued management of cardiogenic shock and consideration for advanced therapies.

Upon arrival, he was mildly hypotensive (99/56 mm Hg) and tachycardic (105 per minute, underlying atrial fibrillation). He appeared grossly volume overloaded. Labs were notable for hyponatremia (sodium 122 mmol/L), acute kidney injury (creatinine 1.6 mg/dL), and liver injury (total bilirubin 9.1 mg/dL with mildly elevated transaminases). The patient required two inotropes and high dose diuretic infusion to achieve urine output. On hospital day two the patient underwent right heart catheterization that revealed severely decreased cardiac output and elevated filling pressures despite substantial inotropic support. The patient failed to clinically improve despite maximum medical therapy and on hospital day fifteen the patient and family decided to pursue palliative measures. The patient passed away shortly after this decision.

### **Teachable Moment:**

Mitral regurgitation is classified as either acute or chronic, and primary (caused by structural disease such as chordae rupture) or secondary (caused by cardiomyopathy leading to papillary muscle displacement, annular dilation, and resultant poor coaptation of mitral leaflets). In this case, the underlying process was chronic, progressive mitral regurgitation secondary to worsening cardiomyopathy. Current guidelines recommend considering mitral valve surgery in the setting of severe mitral regurgitation only after all other treatment options have been exhausted (class of recommendation, IIb). [1] Given that this patient did not have a cardiac resynchronization device implanted, nor was he on optimal medical therapy, mitral valve surgery may have been avoidable.

This case highlights an important pitfall of modern medicine, namely harms from treatment that, though well intended, may have been unnecessary. With the advanced medical and surgical interventions available to patients and providers nowadays, it is often tempting to treat fixable abnormalities aggressively and promptly. However, in the

case of this unfortunate gentleman, the non-emergent cardiac surgery likely caused his acute decompensation and eventual death. It is helpful for us as clinicians and patients to remind ourselves that “doing everything possible” may not always be the best option and more conservative therapies may be the preferable option.

#### REFERENCES:

- 1 Nishimura RA, Otto CM, Bonow RO, et al. 2014 AHA/ACC guideline for the management of patients with valvular heart disease: a report of the American College of Cardiology/American Heart Association Task Force on Practice Guidelines. *J Thorac Cardiovasc Surg* 2014;**148**:e1-e132.