

Surgical Considerations

Surgery is now indicated for valve diseases more than ever due to the advent of reliable mechanical and biosynthetic prostheses, reliable valve repair procedures and low operative morbidity and mortality. The new guidelines specify who should be considered for various kinds of valve replacements/repairs. For example, mechanical aortic valve replacement is indicated for patients who already have a mechanical valve in the mitral or tricuspid positions, but a bioprosthesis is suggested for patients who have contraindications for warfarin therapy.

These long overdue guidelines should facilitate the practice of evidence-based medicine, leading to better survival rates and improved qualities of life.

For a downloadable version of the *AHA/ACC 2006 Guidelines for the Management of Patients with Valvular Heart Disease*, please visit: <http://www.americanheart.org/presenter.jhtml?identifier=3040213>

Percutaneous and Surgical Approaches to Valvular Heart Disease

Percutaneous Approaches to Mitral Regurgitation (MR)

Two trials, EVEREST I and II (Endovascular Valve Edge-to-Edge REpair STudy), examined the efficacy and safety of clip devices in treating patients with moderate to severe MR. EVEREST I, a non-randomized trial which is now complete, can be cautiously compared with data from the Society of Thoracic Surgeons (STS) database. Notably, patients enrolled in EVEREST I were older, had more diabetes, and more heart failure than those in the STS database.

After 30 days, 95% of the 92 patients in EVEREST I had no adverse events, and the one death was unrelated to treatment. These data show that the device decreases MR; 70% of the 82 patients available for follow-up had an MR reduced to $\leq 1+$. Finally, says Peter Block, MD, Professor of Medicine in the Department of Cardiology at Emory University, "the good news is that the surgical options are not taken away." Therefore, if a clip implant is unsuccessful, a patient retains the option of surgery. EVEREST II is a randomized trial that will allow more direct comparisons between surgical and percutaneous edge to edge repair efficacy; investigators are anxiously awaiting these results.

Additional devices in development include the coronary sinus device from Viacor, the Mitralign system, the Edwards self expanding device and the Ample device.

Percutaneous Devices for Aortic Valve Disease

Although patients with aortic stenosis typically benefit from surgical replacement, an increasing number of individuals are poor candidates due to age and other factors. A percutaneous device, the Cribier-Edwards valve, is deployed through a patient's circulatory system and opened in the heart. John Webb, MD, Director of Interventional Cardiology at St. Paul's Hospital in Vancouver, and colleagues conducted a study to determine the efficacy and safety of this procedure. A femoral approach was used on about 60 patients and an apical approach was used on about 20 patients. Data is currently available only on the first 50 femoral patients. At 30 days, the predicted mortality was 28% in these patients with multiple co-morbidities, whereas the actual observed mortality was only 12%. There appears to be a learning curve, says Dr. Webb; the first 25 patients suffered from 16% mortality whereas the last 25 patients had a rate of only 8% (The Vancouver Registry).

The CoreValve self-expanding bioprosthetic valve has also recently had some impressive results. Initial trials show that the implantation of this small 21 French-sized catheter may reduce mortality and morbidity rates in patients with AS. Given the high incidence of peripheral vascular disease in this patient population, the apical approach appears to be an attractive option.

Mitral Regurgitation: State-of-the-Art Management

Optimal treatment of mitral regurgitation (MR) requires the determination of disease etiology, severity and mechanism. Organic MR is caused by inherent mitral disease, such as rheumatic disease. Conversely, in functional MR, the papillary muscles, chordae, and valve leaflets are structurally normal; the disease is caused either by ischemic or idiopathic left ventricular (LV) dilation.

Organic MR

Whether to repair or replace a valve is not based solely on the skills of the surgeon or diagnostician, but also on predicted outcome. “With the advent of repair techniques, the threshold for patients referred for surgery has decreased,” says Michael Argenziano, MD, Director of the Surgical Arrhythmia Program, New York-Presbyterian Hospital’s Columbia Medical Center.

Although it is almost impossible to compare the outcomes of replacement and repair techniques due to lack of clinical trial data, decreased mortality and morbidity is associated with repair. Importantly, however, patients more likely to get repairs are younger and have fewer co-morbidities. Despite patient characteristics, longevity of the repaired valve is clearly superior.

The etiology of organic MR requires unique procedures. For annular dilatation, Dr. Argenziano recommends ring annuloplasty to reduce the circumference of the annulus. More recently, remodeling of the 3-dimensional annular shape is thought to be important. For posterior leaflet prolapse, quadrangular resection is recommended. “For anterior leaflet prolapse there are many more techniques...we are not very good at anterior leaflet pathology,” says Dr. Argenziano. Some of these techniques include chordal transposition, chordal shortening, triangular resection and edge-to-edge repair (Alfieri stitch).

Functional MR

Functional MR is not a disease of the valve per se, but rather a disease of the ventricle involving local or global LV remodeling. Functional MR is also dynamic. For example, some patients have only mild MR at rest which increases during exercise. This dynamic component, defined as $>13\text{mm}^2$ increase in the effective regurgitant orifice (ERO), is associated with a 5-fold increased risk of mortality.

Medical treatment is the mandatory first step in patients with functional MR. These agents can reduce loading conditions and can be useful by inducing progressive inverse LV remodeling. Angioplasty is indicated in selected patients with pure ischemic MR, while cardiac resynchronization therapy is useful in patients with LV dyssynchrony. CABG and surgical MV repair may be performed in selected patients. Finally, edge-to-edge repair (clip) and coronary sinus approaches to annuloplasty are two percutaneous options on the horizon for patients not fit for surgery. In order to determine which therapies are best for which patients, more data from prospective registries and randomized trials are needed.