

Best of the 2001 ACC Annual Snowmass Cardiovascular Conference

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The 2001 American College of Cardiology (ACC) Snowmass meeting covered a wide variety of cardiovascular topics relevant to the clinical cardiologist; this review includes only a few selected presentations.

Dr. Robert Bonow's presentation, "Medical Therapy for Aortic and Mitral Regurgitation: Is it Safe? When to Operate" explored an issue frequently found in clinical practice. The usual balance of risk and benefit determines the decision on valve repair/replacement. Surgical tech-

niques and operative mortality have improved over the years, and there is general agreement that surgery should be timed according to the development of symptoms related to the valve lesion. Subgroups of asymptomatic patients can also be identified who could benefit from surgery.

Aortic Insufficiency

Preoperative left ventricular (LV) systolic function is an important determinant of postoperative prognosis. Left ventricular ejection fraction is the most sensitive factor in identifying symptomatic patients who will have persistent LV dysfunction and congestive heart failure. In some patients,

the onset of symptoms is preceded by the development of LV dysfunction. In asymptomatic patients, the time course between the development of LV dysfunction and symptoms that would direct aortic valve replacement (AVR) is short (2 to 3 years). Postoperative prognosis and improvement in LV function are enhanced in asymptomatic and mildly symptomatic patients compared with those who have severe symptoms.

Asymptomatic patients with normal LV function have an excellent prognosis, with a slow rate of deterioration towards requiring surgery. They have a mortality rate of 0.5%, and fewer than 4% a year will develop serious

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symptoms or LV dysfunction. Patients who will eventually require surgery can be identified by either LV dilation on echocardiogram, progressive increases in LV dimension, or decreases in resting ejection fraction. Patients at risk for sudden death usually have LV diastolic dimension greater than 80 mm or systolic dimension greater than 55 mm.

Indications for AVR include the following:

1. Onset of symptoms (dyspnea, angina, syncope, or presyncope)
2. Onset of LV systolic dysfunction at rest
3. Development of extreme LV dilation.

Medical therapy should be restricted to the asymptomatic patient with normal LV function. Although reductions in regurgitant volumes are obtained with vasodilators such as nifedipine, hydralazine, and nitroprusside, only nifedipine in longer term studies has been shown to reduce the progression to symptoms or LV dysfunction.

Mitral Insufficiency

The development of irreversible LV dysfunction can occur in the absence of symptoms. Survival after mitral valve replacement (MVR) is influenced by age, atrial fibrillation, and preoperative ejection fraction. Because the regurgitant flow in mitral insufficiency is directed into a low-impedance atrium, ejection fractions and other measures of LV function overestimate true LV function. Although patients who undergo AVR will commonly have improved function, MVR is often followed by a deterioration of LV function, which can slowly improve. Persistent LV dysfunction following mitral valve surgery occurs with resting LV ejection fraction < 60% and LV end-sys-

tolic dimension of 45 mm. When they are performed in centers with excellent outcomes, surgical approaches that preserve the mitral annulus (such as mitral valve repair) result in substantially better improvement of LV function compared with MVR.

The indications for mitral valve surgery include the following:

1. Patients with substantial symptoms
2. Asymptomatic or mildly symptomatic patients who develop atrial fibrillation
3. Asymptomatic patients with LV ejection fraction at rest < 60% or LV end-systolic dimension > 45 mm
4. Development of pulmonary hypertension.

Medical therapy. The medical therapy experience with aortic insufficiency does not translate into the same effect in mitral insufficiency. Despite widespread clinical use of vasodilators such as angiotensin-converting enzyme inhibitors (ACE-I) in patients with asymptomatic mitral insufficiency, there are no large long-term studies indicating any benefit. Short-term hemodynamic benefit is seen only in patients with hypertension and congestive heart failure (CHF). In the absence of hypertension in asymptomatic patients with normal LV function, there is no indication for the use of vasodilators.

Congestive Heart Failure

"Update on CHF" was presented by John Schroeder, MD, from Stanford University (Stanford, CA). In the new patient with CHF, it is important to evaluate carefully for reversible causes including symptomatic or silent myocardial ischemia, tachycardia-induced cardiomyopa-

thy, ethanol and sarcoid cardiomyopathies, and myocarditis. The basic tools for this evaluation include echocardiography, cardiac catheterization with coronary angiography, and possibly biopsy and stress perfusion scanning.

Essential therapy. Therapy should be targeted at blocking adverse effects of angiotensin II (renin-angiotensin system) and catecholamines (sympathetic nervous system), both of which contribute to progressive pathologic remodeling of the left ventricle.

Essential therapy for CHF:

1. Initiate therapy with an ACE-I, up to at least 20 mg lisinopril (Zestril®, Prinivil®), 40 mg quinapril (Accupril®).
2. Monitor serum creatinine with continuation of ACE-I up to a creatinine dose of 2.5 mg/dL.
3. Avoid intravascular depletion with overdiuresis.
4. Switch to an angiotensin receptor blocker if cough develops in response to ACE-I treatment, eg, losartan (Cozaar) 25 to 100 mg/day; valsartan (Diovan) 40 to 160 mg/day; irbesartan (Avapro) 150 to 300 mg/day; candesartan (Atacand) 16 to 32 mg/day; telmesartan (Micardis) 20 to 80 mg/day.
5. Once the patient is stable and ambulatory, initiate β -blocker therapy:
 - a. First choice would be carvedilol (Coreg™) starting at 3.125 mg at night b.i.d. to 6.25 mg b.i.d., titrating up to 25 mg b.i.d. to achieve a resting heart rate between 55 and 60 and maintaining systolic blood pressure greater than 90 mm Hg.
 - b. Second choice would be metoprolol (Toprol XL™) to achieve a maximum dose of 150 to 200 mg/day.

6. Diuretic therapy can be started with triamterene/HCTZ or lasix. Lasix dose can be based on patient's morning weight. Use KCl to maintain serum K > 4.5 < 5. Consider aldactone for class III or IV CHF starting at 12.5 mg/day and titrating to 25 mg/day. Monitor serum potassium closely to avoid hyperkalemia.
7. All patients should be on aspirin therapy unless contraindicated. If there is evidence for atrial fibrillation or left ventricular thrombus, warfarin (Coumadin) therapy is indicated.
8. Mandate regular walking program.
9. Treat comorbid conditions aggressively, including diabetes, hyperlipidemia, hypertension, and obesity.

In making a comparison between carvedilol and metoprolol, certain differences were noted (Table 1), which may be partly related to the different sympathetic receptors blocked by the two agents. (Carvedilol blocks the β_1 - and β_2 -receptors as well as the α_1 -receptor, whereas metoprolol blocks the β_1 -receptor only.) ■

Table 1
Important Differences Between
Carvedilol and Metoprolol

	Carvedilol	Metoprolol
Antioxidant	Present	Absent
Cardiac output	Increase	Decrease
Peripheral resistance	Decrease	Increase
Renal blood flow	+/-	Decrease
Insulin sensitivity	Increase	Decrease
Triglycerides	No effect	Increase
High-density lipoproteins	No effect	Reduces
Low-density lipoproteins	+/-	+/-
Proven efficacy in congestive heart failure (diabetes)	Greater efficacy	No
Proven efficacy in women with congestive heart failure	Yes	No
Proven efficacy in ischemic and nonischemic heart failure	Yes	No

Main Points

- Risk-benefit considerations determine operative decisions for aortic and mitral regurgitation. Mitral valve repair leads to superior results compared to mitral valve replacement in centers with extensive experience.
- In aortic insufficiency, the most important factor for determining the postoperative course is the left ventricular (LV) ejection fraction.
- Surgical candidates for aortic valve replacement may be identified by the development of symptoms, echocardiographic LV dilation, progressive increases in LV dimension, or decreases in resting ejection fraction.
- In mitral insufficiency, age, atrial fibrillation, and preoperative ejection fraction influence the postoperative course after mitral valve surgery.
- Indications for mitral valve surgery include the development of symptoms, atrial fibrillation, pulmonary hypertension and left ventricular dysfunction/enlargement.
- CHF therapy should aim at blocking detrimental effects of angiotension II and catecholamines with the use of angiotensin-converting enzyme inhibitors and β -blockers.