

1542 >5.5 cm) with or without spontaneous echo contrast is more controversial. The novel oral anticoagulants are not approved for use in patients with significant valvular heart disease.

If AF is of relatively recent onset in a patient whose MS is not severe enough to warrant PMBV or surgical commissurotomy, reversion to sinus rhythm pharmacologically or by means of electrical countershock is indicated. Usually, cardioversion should be undertaken after the patient has had at least 3 consecutive weeks of anticoagulant treatment to a therapeutic INR. If cardioversion is indicated more urgently, then intravenous heparin should be provided and TEE performed to exclude the presence of LA thrombus before the procedure. Conversion to sinus rhythm is rarely successful or sustained in patients with severe MS, particularly those in whom the LA is especially enlarged or in whom AF has been present for more than 1 year.

MITRAL VALVOTOMY

Unless there is a contraindication, mitral valvotomy is indicated in symptomatic (New York Heart Association [NYHA] Functional Class II–IV) patients with isolated severe MS, whose effective orifice (valve area) is $< 1 \text{ cm}^2/\text{m}^2$ body surface area, or $< 1.5 \text{ cm}^2$ in normal-sized adults. Mitral valvotomy can be carried out by two techniques: PMBV and surgical valvotomy. In PMBV (Figs. 284-2 and 284-3), a catheter is directed into the LA after transseptal puncture, and a single balloon is directed across the valve and inflated in the valvular orifice. Ideal patients have relatively pliable leaflets with little or no commissural calcium. In addition, the subvalvular structures should not be significantly scarred or thickened, and there should be no LA thrombus. The short- and long-term results of this procedure in appropriate patients are similar to those of surgical valvotomy, but with less morbidity and a lower periprocedural mortality rate. Event-free

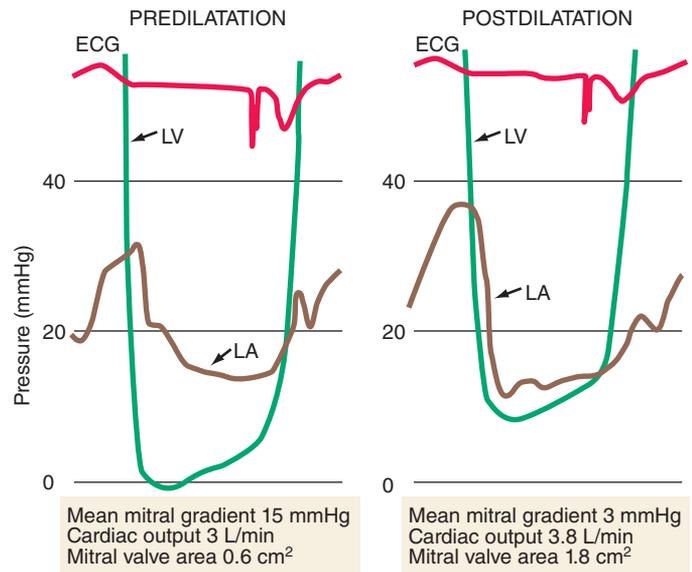


FIGURE 284-3 Simultaneous left atrial (LA) and left ventricular (LV) pressure before and after percutaneous mitral balloon valvuloplasty (PMBV) in a patient with severe mitral stenosis. ECG, electrocardiogram. (Courtesy of Raymond G. McKay, MD; with permission.)

survival in younger (<45 years) patients with pliable valves is excellent, with rates as high as 80–90% over 3–7 years. Therefore, PMBV has become the procedure of choice for such patients when it can be performed by a skilled operator in a high-volume center.

TTE is helpful in identifying patients for the percutaneous procedure, and TEE is performed routinely to exclude LA thrombus and to assess the degree of MR at the time of the scheduled procedure. An “echo score” has been developed to help guide decision-making. The score accounts for the degree of leaflet thickening, calcification, and mobility, and for the extent of subvalvular thickening. A lower score predicts a higher likelihood of successful PMBV.

In patients in whom PMBV is not possible or unsuccessful, or in many patients with restenosis after previous surgery, an “open” valvotomy using cardiopulmonary bypass is necessary. In addition to opening the valve commissures, it is important to loosen any subvalvular fusion of papillary muscles and chordae tendineae; to remove large deposits of calcium, thereby improving valvular function; and to remove atrial thrombi. The perioperative mortality rate is ~2%.

Successful valvotomy is defined by a 50% reduction in the mean mitral valve gradient and a doubling of the mitral valve area. Successful valvotomy, whether balloon or surgical, usually results in striking symptomatic and hemodynamic improvement and prolongs survival. However, there is no evidence that the procedure improves the prognosis of patients with slight or no functional impairment. Therefore, unless recurrent systemic embolization or severe pulmonary hypertension has occurred (PA systolic pressures $> 50 \text{ mmHg}$ at rest or $> 60 \text{ mmHg}$ with exercise), valvotomy is *not* recommended for patients who are entirely asymptomatic and/or who have mild or moderate stenosis (mitral valve area $> 1.5 \text{ cm}^2$). When there is little symptomatic improvement after valvotomy, it is likely that the procedure was ineffective, that it induced MR, or that associated valvular or myocardial disease was present. About half of all patients undergoing surgical mitral valvotomy require reoperation by 10 years. In the pregnant patient with MS, valvotomy should be carried out if pulmonary congestion occurs despite intensive medical treatment. PMBV is the preferred strategy in this setting and is performed with TEE and no or minimal x-ray exposure.

Mitral valve replacement (MVR) is necessary in patients with MS and significant associated MR, those in whom the valve has been severely distorted by previous transcatheter or operative

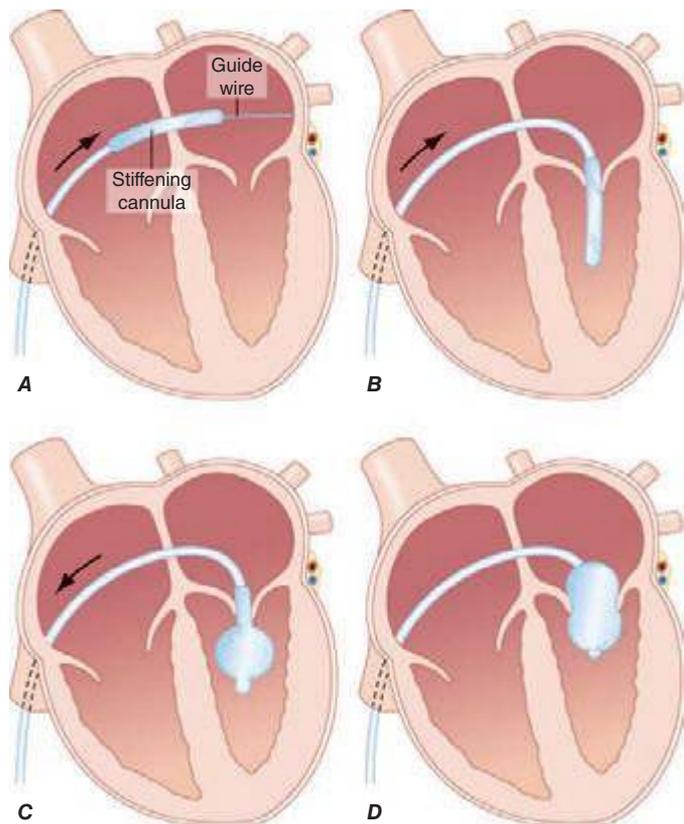


FIGURE 284-2 Inoue balloon technique for percutaneous mitral balloon valvotomy. **A.** After transseptal puncture, the deflated balloon catheter is advanced across the interatrial septum, then across the mitral valve and into the left ventricle. **B–D.** The balloon is inflated stepwise within the mitral orifice.