Surgery for mitral stenosis in patients with pulmonary hypertension: How far can we go?

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Pulmonary hypertension (PHT) has long been recognized as a deleterious consequence of chronic mitral valve disease, particularly in the setting of mitral stenosis (MS), where markedly elevated left atrial pressures are commonly found. PHT is present in virtually all patients presenting to mitral valve surgery for severe MS and has a significant impact on outcomes, especially when severe. Thus, the ultimate question to be answered is how far can we go on performing operations in patients with severe PHT?

In this issue of the *Journal*, Yang and colleagues¹ attempt to shed some light on this relevant topic. The authors analyzed the short- and long-term outcomes of 317 patients undergoing surgery for MS during a 20-year period. Patients were categorized according to their pulmonary artery pressure (PAP) (normal, <34 mm Hg; mild, 35-44 mm Hg; moderate, 45-59 mm Hg; and severe, ≥60 mm Hg). More than two thirds of patients had moderate or severe PHT, and the majority were in New York Heart Association class III and IV, suggesting a high-risk group. Although the 10% perioperative mortality reported appears rather high for current standards, it may be accepted having in mind the patients' profiles, but long-term survival was impaired by moderate to severe PHT.

Recently, we have also shown that significant PHT is associated with poor prognosis regarding late survival (Figure 1), and even modest increases of PAP have been demonstrated to be associated with adverse outcomes (15-year survival of 63.9% ± 8.5% and 84.8% ± 4.5% for patients with and without significant PHT, respectively; $P = .001$).² Ghoreishi and colleagues³ had previously come to similar conclusions. However, these works involved mostly patients with mitral regurgitation of degenerative origin and not MS.

Unfortunately, the current study does not completely respond to the previous question, because we still do not know which degree of PHT makes surgery prohibitive and which patients will recover to normal or near-normal PAP values after successful mitral intervention. Mubeen and colleagues⁴ reported that mitral valve replacement can be

Survival of patients submitted to mitral valve surgery according to the degree of PAH.

Central Message

PHT is generally considered a risk factor during surgery of the mitral valve, but the risk can be mitigated by careful preoperative evaluation and perioperative management.

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safely performed in patients with moderate to severe PHT (mean, 58.1 mm Hg), with an operative mortality of 5.5%. By contrast, an operative mortality of 28.5% was recorded in patients with supra-systemic PAP and high pulmonary vascular resistance, which led the authors to conclude that patients with severe PHT could undergo mitral valve surgery, as long as PAP was below systemic pressure. In our daily practice, we consider it safe to perform MV surgery whenever the PAP is less than 80% of the systemic pressure, but beyond that level, the risk increases exponentially.

On the other hand, Enter and colleagues,⁵ against all scientific evidence previously published, questioned the impact of preoperative PHT in perioperative and late outcomes. These authors found no differences regarding 30-day mortality and late survival after performing propensity-score matching between patients with and without severe PHT.

Preoperative evaluation is of utmost importance, and Doppler echocardiography is a key tool for the diagnosis of PHT and assessment of its repercussion on right ventricular function. Assessment of PAP during stress echocardiography may provide additional prognostic information beyond resting evaluation. Patients with suspected severe PHT should have a right heart catheterization with direct measurement of PAP, pulmonary vascular

FIGURE 1. Survival of patients submitted to mitral valve surgery according to the degree of PAH.² PHT, Pulmonary hypertension.

resistance, and pulmonary arterial reactivity to vasodilators. Cardiac magnetic resonance also is useful for assessing right ventricular geometry and function.⁶

Another relevant issue when dealing with patients with PHT is perioperative management. We have recently drawn attention to the lack of information reported in surgical studies about this subject. The use of new pulmonary vasodilators and inotropes could substantially help these patients during and after surgery.⁷

In conclusion, the presence of severe PHT usually is not a contraindication to mitral valve surgery, whether for MS or mitral regurgitation. But there is great concern when PAP is nearly or supra-systemic, and additional investigation regarding the reversibility of the PHT is required. Because the majority of studies have shown a greater risk of perioperative and late mortality with moderate to severe PHT, strategies to reduce PAP before surgery and an early intervention approach to the mitral valve should be pursued.

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