

Specifications and Benefits of Minimally Invasive Mitral Valve Surgery and Alternative Techniques

Condiciones y ventajas de la cirugía de válvula mitral mínimamente invasiva y técnicas alternativas

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Minimally invasive mitral valve surgery (MIMVS) has become a standard technique for mitral valve surgery and has achieved great interest in the surgical community. In Germany, almost 50% of all isolated MIMVS procedures (n=6,117) were performed with this approach in 2016 (Annual Report of the German Society for Thoracic and Cardiovascular Surgery).

Minimally invasive mitral valve surgery has shown to have specific advantages compared to median sternotomy, facilitating lower blood loss, reduced trauma, faster recovery, improved cosmetic results, earlier mobilization and excellent visibility of the mitral valve. This latter aspect has been specifically important for teaching issues, as the mitral valve is difficult to observe from the left side of the table (1-3). Despite a known learning curve associated with the technique, (4) MIMVS has developed in experienced centers, offering specific advantages even in complex cases.

The manuscript by Fortunato G. A. et al. in this issue of the Journal addresses this topic (5). The authors defined mitral valve endocarditis, previous cardiac procedures and/or patients with a predicted morbidity and mortality risk score >10% according to the Society of Thoracic Surgery (STS) as “complex” cases. In a consecutive, single center series of 135 patients, 45 patients met the described criteria of “complex” and were operated on by MIMVS. The observed mortality was lower compared to the predicted one (4.4% vs. 6.08% ± 10.8%).

It is clear that careful patient selection and planning of the surgical technique is mandatory in MIMVS. Especially in patients with previous cardiac procedures, the best option for myocardial protection has to be chosen. In the series reported by Fortunato G.A. et al. six patients were reoperations. In all cases a Chitwood clamp was used. Alternative techniques are the use of an endo-balloon, ventricular fibrillation with

hypothermia or the beating heart procedure. Some of these techniques were used by Seeburger J. et al. in a series of 181 patients undergoing MIMVS with previous sternotomy (6). As it is not always possible to dissect the ascending aorta to apply the X-clamp, use of the endo-balloon, hypothermic ventricular fibrillation or the beating heart surgery techniques may also be good alternatives. These strategies are particularly helpful in patients with patent grafts to the left side of the heart.

Minimally invasive mitral valve surgery may be even the optimal surgical strategy in redo patients, as this approach decreases the risk of bleeding, due to limited dissection. It also reduces the risk of myocardial damage, especially in cases where the heart is directly attached to the sternum. In addition to this indication, Reser D. et al. (7) performed MIMVS in obese patients and concluded that these patients might benefit from this approach because of a reduced risk of sternal wound infection.

It becomes clear that MIMVS should be considered especially when specific risk factors are present. There are, however, also circumstances when MIMVS should be avoided, at least in our experience. These are deformations of the thorax with the heart being shifted to the left side, severe mitral annular calcifications requiring extensive annular reconstruction and also patients with infective mitral valve endocarditis and annular abscess formation, also requiring reconstruction of the annulus. It is also evident that MIMVS should be avoided in patients with greater than first degree aortic valve regurgitation due to insufficient myocardial protection.

In conclusion, the series presented by Fortunato G. A. et al. represents an excellent example indicating that MIMVS can and maybe should be performed in selected “complex” patients. In this context, the definition of “complex” includes reoperations, infective mitral valve endocarditis, and in general, patients with

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a calculated STS-PROMM risk score >10%, respectively. The adequate expertise of the center that performs MIMVS is of great importance. Careful patient selection and judgement of the adequate and individual myocardial protection strategy will lead to improved patient outcome.

Conflicts of interest

None declared.

(See authors' conflicts of interest forms on the website/Supplementary material).

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