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Commentary: Between Scylla and Charybdis

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The issue raised by Gooden and colleagues¹ is definitely of great clinical relevance, since the ultimate goal of the percutaneous edge-to-edge procedure is to eliminate mitral regurgitation (MR) without producing mitral stenosis (MS). This optimal outcome can be achieved in the majority of patients using 1, 2, or even more clips.² However, particularly with the expansion of selection criteria, ideal results (no MR and no MS) are not always obtained, and a balance between maximal reduction of MR and minimal increase in gradient may represent a reasonable compromise.

It has been repeatedly documented by our group^{3,4} and others⁵ that residual MR after the MitraClip procedure is associated with suboptimal mid-term results and therefore efforts to minimize MR by implanting an additional clip are fully justified. However, when 2 or more clips are needed, an increased gradient can be expected, and this could negatively influence the outcome. The effect of some degree of MS seems to be clearly defined in the literature. In a series of patients predominantly affected by functional MR, a transvalvular gradient greater than 5 mm Hg correlates with unfavorable long-term results.⁶ Furthermore, elevated transmitral gradients tend to be correlated to a greater incidence of atrial fibrillation after mitral valve repair.⁷

In this elegant study, the performance of porcine mitral valves in basal conditions and various degrees of MR is assessed after the deployment of 1 and 2 clips using a pulsatile in vitro left heart simulator. Gradients across the mitral valve are accurately measured with high-fidelity

Exponential correlation between number of clip and elevated gradient.

CENTRAL MESSAGE

The goal of percutaneous edge to edge is to eliminate mitral insufficiency. Implantation of 1 or 2 MitraClips significantly reduces valve regurgitation without inducing stenosis.

transducers. The model reproduces the specific case of degenerative MR due to P2 flail. The findings of the study are definitely encouraging: the implantation of 1 or 2 MitraClips significantly reduces MR without inducing relevant MS.

In clinical practice, patients submitted to percutaneous edge-to-edge repair are mostly affected by functional MR, a condition often associated with remarkable annular dilatation where the deployment of 1, 2, or even more MitraClip devices is less likely to result in significant MS.

Also, in patients requiring the MitraClip procedure for degenerative MR, the annulus is often dilated and therefore in the great majority of cases the probability of a significant transvalvular gradient following the intervention is minimal. In our large experience with surgical edge to edge for degenerative MR, postoperative MS has never been observed.⁸⁻¹¹

Occasionally, the chance of producing a relevant MS following the implantation of 2 or more clips is not negligible. Patients expected to develop this complication can be identified in advance by echocardiography on the basis of the initial valve area¹² and the intercommissural jet extension/location. In these patients, the target should be maximal reduction of MR and minimal increase of gradient across the valve. To achieve this acceptable compromise, the operator should be guided by continuous left atrial pressure monitoring.¹³ In addition, planimetric area of newly created mitral orifices should be promptly provided after

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each grasping of the leaflets to facilitate the decision-making and optimize the result.

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