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Impella-Clip: a secure and effective strategy in cardiogenic shock due to acute severe mitral regurgitation. How would I approach it?



Impella-Clip: una estrategia segura y eficaz en el shock secundario a insuficiencia mitral aguda. ¿Cómo lo haría?

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HOW WOULD I APPROACH IT?

In their case presentation, authors described an interesting case of acute severe mitral regurgitation of functional etiology due to inferior wall myocardial infarction progressing into cardiogenic shock.

Acute and subacute mitral regurgitation due to myocardial infarction is a clinical condition of grim prognosis that is relatively common in our routine clinical practice.¹

These patients' sign of presentation can be rapidly progressive heart failure hours or days after the ischemic event with poor response to medical therapy. No wonder then that, on many occasions,^{2,3} in the evolved infarction without reperfusion or delayed reperfusion setting, severe rapidly progressive courses towards cardiogenic shock can occur.

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The fundamental anatomical mechanism through which mitral regurgitation occurs can be posterior leaflet restriction often in its more medial or medial-central scallops (P3 or P2-P3) due to specific regional dysfunction of myocardial contractility due to infarction.¹

As in the case presented here, these are often inferior or inferior-posterior wall myocardial infarctions due to the occlusions of very-well developed left circumflex arteries or very dominant right coronary arteries. These are high-surgical risk patients following their poor clinical and hemodynamic situation. Although, traditionally, the only possible procedure for these patients was mitral valve repair or replacement surgery, surgical results are associated with a high in-hospital mortality rate due to both these patients' unstable clinical situation and procedural complications.¹

In this sense, transcatheter mitral valve repair with edge-to-edge approximation has proven as a safe and effective option even in the presence of cardiogenic shock.¹⁻³

In this clinical setting, the first thing that should be taken into consideration is the patient's hemodynamic support with the device each center is most experienced at. Afterwards, transcatheter mitral valve repair can be considered to treat valvular heart disease as a first-line therapy in cases of favorable anatomy as it is a fast and effective solution with a low rate of complications and lower mortality rates reported compared to surgical and, obviously, conservative treatment.¹

In a case like the one presented by the authors, the first I would do is to guarantee the patient's hemodynamic support. In this sense, devices like the Impella CP (Abiomed, United States) or a combination of extracorporeal membrane oxygenation and intra-aortic balloon pump could be good alternatives.

The next step would be to perform transcatheter mitral valve repair with the MitraClip device (Abbott vascular, United States). I would use the right femoral venous access with ultrasound-guided puncture and perform a transesophageal echocardiography-guided transeptal puncture (posterior and superior). The technical characteristics of the procedure in an acute setting are no different compared to those of a scheduled case. Due to the medial-central origin, width of the device, and length of the leaflet, in that area my strategy would be to use a MitraClip NTW device (small and wide) for the most commissural region (A3-P3) probably followed by a second similar MitraClip device (NTW) attached to the former towards the valve medial-central region.

In cases where the posterior leaflet has a larger size and there is a possibility of associated anterior leaflet pseudoprolapse, the use of a larger clip (XT or XTW) or a capture maneuver regardless of the leaflets would be necessary to facilitate device implantation and improve valve coaptation.

We should be extra cautious with patients like the one presented here due to the possibility of an unusual interference between the MitraClip release catheter and the Impella catheter when crossing the mitral valve to capture the leaflets.

It is of paramount importance to reduce hemodynamic support momentarily (in this case the blood flow supplied by the Impella device) to assess the transmitral gradient, the degree of residual mitral regurgitation after the first clip, and the final outcomes.

The case presented here is that of a particularly significant clinical condition due to its severity, emergency, and high-surgical risk.

Transcatheter mitral valve repair with edge-to-edge approximation can be considered a first-line therapy not only because it is not too aggressive, and also because it is safe, fast, and effective in patients with severe, acute, functional mitral regurgitation with heart failure due to myocardial infarction causing mitral posterior leaflet restriction.¹

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CONFLICTS OF INTEREST

I. Pascual is a proctor of MitraClip for Abbott Vascular.

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