Naturally, the decision to repair or to replace was influenced by the characteristics of the patient and of the valve, and a repair was preferred whenever possible, which may have created a bias. This was the rationale for performing propensity score matching to obtain more similar groups for comparison, a well-known and accepted statistical method for this type of analysis. Relevant demographic, patient, and echocardiographic characteristics, including mitral valve pathology, were included in the propensity score analysis.

We could not demonstrate a clear survival benefit in the repair group, but we can also hypothesize as to reasons for this fact. First all, we recognize that we unfortunately do not yet have a long follow-up time (up to 12.5 years, mean 5.4 years), and we believe that a longer study might have shown evidence of that advantage. Second, the small number of patients subjected to comparison may have also influenced the analysis. We have to acknowledge, however, the possibility that there is simply no survival benefit associated with repairing the mitral valve. Nevertheless, mitral valve repair showed advantage in patients older than 65 years ($P = .017$) and for nonrheumatic etiology ($P = .034$). A very recent article from Gaur and colleagues,⁴ due to be published in this Journal, supports our finding, stating that “elderly patients with mitral regurgitation who undergo MVP [repair] have better postoperative outcomes, lower operative mortality, and improved long-term survival than those undergoing MVR [replacement].” Regarding the latter, we intuitively believe that it is better to repair than to replace a degenerative mitral valve, because there is enough evidence accumulated in the literature favoring that approach.⁵

Our study implies some important take-home messages. First, double valve surgery can be performed with low mortality (nearly 1%), whether repairing or replacing the

mitral valve. Second, major adverse valve events are more common with mitral replacement. Third, there was only a survival advantage in repair for older patients with nonrheumatic valves. Overall, we believe that mitral valve repair is the best option in the setting of concomitant aortic valve replacement.

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CONVERSION FROM PERCUTANEOUS VENOARTERIAL EXTRACORPOREAL MEMBRANE OXYGENATION

ACCESS TO A PERIPHERAL ARTERIAL CANNULATION: IS IT SAFE?

To the Editor:

We read with interest the elegant article by Demertzis and Carrel¹ dealing with the technical approach of peripheral cannulation of extracorporeal membrane oxygenation (ECMO). Indeed, the considerable renewed interest in and accumulating evidence for the use of ECMO during the last few years is likely attributable to the observed improvements in extracorporeal technology.

Since 2005, when Leprince and co-workers² published the first series of ECMO cases, the most significant benefit of ECMO has been observed in the setting of cardiogenic shock related to myocardial infarction or to end-stage chronic heart failure. In this setting and for this type of patient, diminishing the time between the initiation of shock and the start of circulatory assistance becomes the main concern of the surgical staff. In this context, the cannulation of the ECMO device through a percutaneous technique has become a trendy approach to gain time. Unfortunately, we have forgotten that these patients may have peripheral arterial diseases and a consequent high incidence of calcified arteries, a situation that makes the use of the percutaneous technique much less indicated.

Demertzis and Carrel¹ have described a very attractive surgical technique to convert a percutaneous technique into an open access one. In this regard, we have some comments.

The most important drawback of the use of femoral artery prostheses is the risk of infection, in particular for patients waiting for a heart transplant or for LVAD implantation. On the other hand, during the last few years the most useful technique has been the Seldinger technique following a surgical incision with a reperfusion cannula placed in the superficial femoral artery. The current

FIGURE 1. Positioning and separation of cannulas in the percutaneous cannulation technique for extracorporeal membrane oxygenation. A indicates the intra-aortic balloon pump; B indicates the percutaneous femoral vein; C indicates the reperfusion catheter in the superficial femoral artery (10 cm below the inguinal ligament); and D indicates the percutaneous femoral artery.

procedure is a way of avoiding any hazardous puncture, particularly in the case of patients with low flow and low pulsatility or cardiac arrest. Moreover, this practice also allows the visualization of the vascular insertion of the cannula, a situation that is reassuring in cases of coagulation impairments.

Therefore, even if venoarterial ECMO is usually provided as a surgical technique, it seems logical that this procedure takes place in the intensive care unit in emergency cases. In this regard, our team recommends 2 kinds of procedures: (1) a Seldinger technique after surgical incision or (2) a percutaneous ultrasound-guided insertion technique derived from the intensive care unit vascular catheter insertion. This latter technique guides the femoral vessel puncture, significantly reduces such complications as bleeding and hematoma, and allows the correct insertion of wires,³ even if there is no pulse. Furthermore, in this percutaneous technique, as described by Lamb and associates,⁴ the 2 cannulas should be separated, a cannula positioned on the right vessel and the other on the opposite side (Figure 1).

In summary, we do recommend either a surgical approach associated with vascular puncture by the Seldinger technique or a strict

percutaneous ultrasonographically guided approach, including the introduction of the reperfusion cannula. We believe that the crucial points to avoid leg ischemia are as follows: (1) the femoral arterial cannula should be as thin as possible (maximum size 17F in women and maximum size 19F in men) and (2) the reperfusion cannula should be introduced systematically during the 6 hours after ECMO implantation.

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Reply to the Editor:

I read with interest the letter of Banfi and colleagues referring to our brief communication on surgical technique¹ and appreciate their comments. I agree with both of their suggestions regarding cannulation for extracorporeal membrane oxygenation, surgical cutdown and wire-guided cannulation or a fully percutaneous approach exchanging already inserted catheters over the wire. This is indeed our standard primary approach when time, place (catheterization laboratory), and the clinical situation of the patient permit it. In “crash and burn” scenarios, the approach might change.² The surgical technique that we described in our communication is a safe way to convert a percutaneous cannulation to a transprosthetic one when a distal perfusion cannula cannot be safely inserted. Further, in patients needing higher flow rates than a percutaneous cannula can provide safely, the transprosthetic approach allows the use of the whole lumen of the artery for perfusion, thus avoiding high pressure gradients across the cannula. The risk of infection of the vascular prosthesis in cases of longer extracorporeal membrane oxygenation perfusion has to be weighted against potential diameter limitations of the perfusion cannula and complications of the distal perfusion cannula technique (kinking, dislocation, thrombosis). I thank Banfi and colleagues for their interest in our work and their mindful comments.